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Sexuality and pathological specialization in *Erysiphe polygoni*

V. P. Pawar

Dept. of Botany, Arts and Science College Bhalod

Abstract:-
Five conidial isolates of ***Erysiphe polygoni*** from ***Vinga unguiculata*** were mated on detached whole leaf cultures. Cleistothecia formed in eight compatible mating atthe meeting point of the two cultures. Cleistothecia never developed in signal cultures. Single conidial isolated from ***Passium sativum, vinga radiate*** and ***Vinga munga.*** Were cross inoculated to either host. Isolate from***Passium sativum*** was virulent to ***Vinga unguiculata***and its own host. Isolates from other host species infected each host species except **Passium sativum**.It is concluded that***E.polygoni*** is heterothallic and it occurs in two pathological races in Jalgaon Dist. Significance of these conclusions in breeding resistant variety is discussed.
Keywords: ***Erysiphe polygoni***, sexuality, pathotype
Powdery mildew is the most serious disease of papilionaceae causing heave losses of crop throughout the IndiaKhosla et, al.(1988) Genetic variation within the pathogen is of fundamental importance in disease resistance studies and in disease control by means of host resistance(Hooker,1967: Robinson,1976: Van der Plank,1968,1969).In breeding for disease resistance, understanding of the variability in the pathogen is as important as that in the host. Knowledge of the sexuality of the pathogen will permit identification of the source of its variability .The powdery mildew pathogen of cucurbits is *S.fuliginea* (Kabitarani,A and Bhagirath,1991).This paper reports the sexuality and pathologicalspecialization of this fungus in Jalgaon Dist.

MATERIALS AND METHODS

Five conidial sample of ***Erysiph polygoni*** from ***vinga unguiculata*** plant,different in fruit shape and size ensuring varietaldifference,were collected from five different areasof Jalgaon Dist. Along with respective host seeds .The host plants belonged to a collection of germplasms and received accession Nos.$_{P1, P2,P3, P4}$, and p_8.Field evaluation revealed them to be of different cultivars. Single conidial isolates of the five conidial samples were maintained by transferring the single conidia that had been germinated by distinguishing per cent agar coated side to detached leaf culture(From four leaf stage plants) that had been lightly sprayed with distilled water using a hand atomizer and incubated at 20_{+-} 1^0c and 12 hours photoperiod of 320 ft .c. light intensity. The five single conidia isolates were mated at random by co-culturing them on the leaves of both the

respective host plants. Mating characters of these isolates were determined based on the reactions of five host cvs to the isolates after cross-inoculations.

In, ***Erysiphe polygoni*** was observed on ***Pasium sativum***(Mandloi et, al 1988, Mnujal et, al 1963*),**vingaradiate** (*Thakur and Agrawal 1995 ,Kunkliker et, *al* 1991*) ,**vinga mungo**(*Khan et, al 1998 and Sexena 1991) and ***vinga ungaiculata***(Singh and Singh 1999) . Single conidial isolates from these papilionaceous species were maintained on detached leaves of their respective host plants. Cross inoculations were made with conidia from eitherpapilionaceous species to other species on four leaf stage plants .Disease reactions were rated 15 days after inoculation on 0-4 scale 0=no symptom, 1= clear specks but no 2 =blotches just formed ; 3=leaf full of blotches with petioles and or stem infection; 4= leaf drying or completely dried.

RESULTS AND DISCUSSION

Vinga radiate leaves were found to be suitable medium for single conidia culture as roots develop profusely from the cut end of the petiole .Single conidia isolates were cultured on detached leaves for more than one year by transferring the cultures on fresh leaves for every

Table:- 1 Mating characteristics of the five isolatesof ***Erysiphe Polygon*** is determined by presence or absence of Cleisotothecia.

Isolates	P1	P4	P5	P6	P8
P1	-	-	-	-	-
P4	-	-	-	+	+
P5	-	-	-	(+)	+
P6	(+)	+	+	+	-
P8	+	-	-	-	-

- =No of cleistohecia ;+ cleisothecia ; (+) cleisothecia were not always formed 15 days .No cleistothecial development occurred in single isolate cultures. When mating were performed among five isolates the anamorphs were transforming into teleomorph and cleistothecia appeared in 1-3 months depending in the conidial masses minted (Table; 1) In some species pathogen cleistothecia p6 developed every mating oysters cleistothecia developed occasionally .Cleistothecia matured in 1-2 week, and were black and macroscopically visible. Cleistitheca usually developed at the meeting point of the two compatible isolates.

Pathological specializations.

Table2 the reaction ofvarious paplionaceaceous species to different isolates of the fungus. Isolate from***Passium sativum*** was virulent to ***Passium sativum ,Vingaradiate ,Vinga***

mungo*, and*vinga unguiculata, only ***v. unguiculata***was susceptible only to its own isolates. Isolate from ***Passium sativum*, *vinga radiate*** and ***Vinga mungo*** infected each other host almost equally well, and thus considered to be of the same pathotype whereas isolate from ***Vinga unguiculata***is probably a different pathotype.Cleistotheca of ***Sphaerotheca fuliginea*** developed on ***C.moschata*** only when two compatible isolates were **Table:2**- Reaction of different isolates of ***Erysiphe polygoni*** with various species expressed on 04 visual scale.

Isolates	Disease reaction			
Form	*P.sativum*	*V.radiata*	*V.mungo*	*V.ungiuculata*
Passium sativum	**3.8**	**3.9**	**3.3**	**3.o**
Vinga radiata	**3.6**	**3.7**	**2.9**	**2.6**
Vinga mungo	**3.0**	**3.3**	**3.5**	**3.6**
Vinga unguiculata	**2.6**	**3.0**	**3.4**	**3.2**

mated indicating heterothallic nature of the fungus. Through **Homma (1933**) found the single conidium cultures of the fungus formed cleistotheca on Taraxacum and concluded that the fungus was homothallic. Further experimentations showed that it was more commonly heterothallic **(Homma, 1937)**The present study shows that in Jalgaon Dist, **E*rysiphePolygoni*** occurring on different papilionaceous species of different pathotype (Table 2). In ,Punjab ,3 pathotypes of the fungus have been isolated from different papilionaceous species(**Kaur and Jhooty.1985,1986).**Heterothallic sexual reproduction permits genetic recombination there by causing genetic variation of the pathogen .Pathological and physical variation of this fungus probably its genetic changes. Genetic recombination will offer great potential to the fungus to overcome vertical or monogenic resistance. For oligo genic resistance host plants, a search for independent series of linked resistance genes is needed. For establishment of the relationship among resistance genes identified in various host cultivars, well defined races of the pathogen should be against the host cultivars.

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Impact of Irrigation on Crop Diversification in Northern tahsil in Jalgaon District

Dr. R. V. Bhole
Sardar Vallbhbhai Patel Art & Science College Ainpur Tal- Raver Dist- Jalgaon

Crop Diversification raising the variety of crops on arable land. The agroclimatic irrigation as well as technological considaration impacts on crop diversification. It govern the agricultureal reginalization and useful for the identification of cropping pattern of the region.

The main objective of the study of diversification isthet it enables us to understand the impact of physical and social-economic conditions on the agriculture. It s useful in knowing the contemporary competition among crop for area for rotation and effect on double cropping total production and per hector productivity.

Jasbir singh (1976) made a statement that the keener the competition the higher the magnitude of the diversification and lrsser the competition the greater will the trend toward specialization or monoculture farming where emphasis is on one or two crops.

An attempt is made here to analysis the nature of crop diversification and its spatio-temporal variations in micro region i.e. Northern tahsils of jalgaon district. With the help of jasbir singhs techniques for 1998-2003and 2009-2013. The modidied formula developed by Jasbir Singh is as below Percentage of total harvested

$$\text{Index of Diversification} = \frac{\text{Area Under" n"Drops}}{\text{Number of N Crop}}$$

The ' N' crops are those which occupy individually 5 percent or more of the harvested area of taluka. The same technique is applied for present investigation.

At present crop diversification is very high in study region.It has been increasing day by day due to various man made factors irrigation is one out of them. It has special impact on diversification so more emphasis have been given on the improvement in the irrigation facilities all over the world. Irrigatiopn makes possible to take the production of variety of crops two or three times in a year and ultimately leads to more diversification.

Objectives

1) To identify the degree of crop diversification in northern tahsils of jalgaon district.

2) Two examine the impact of irrgation on crop diversificstion.

Study Area-

The study region is located between 21° 25' to 21°15 ' North latitudes and 75°18' to 75°02 ' East longitude is situated .The study region is very irregular in shape, some what resembling a slanting cross with length of 120kms and breath of 52kms the region covers an area of 2029.03sq kms. It has total population 855695 persons according to 2011 cesus. Agriculturew is main occupation of the people in this region. This region having 75.23 percent arable land which was under cultivation. Both kharif nd rabbi crops have an important in this region.

Methodology—The present study is based on secondary data.Population about the area under different crops in a study region is taken from socio - economic abstract of Jalgaon District 1998-2003,and 2008-2013. Jasbir Singhs method of crop diversification is employed for measuring diversification indices. The variation in spatial pattern of indices are examined for year 1998-2003 and 2008-2013 for studying the variation in indices four diversification levels are registered namly i)area of high diversification below 20 ii)area of moderate diversification 20 to 25 iii)area of low diversification above 25. The crop diversification is inverswely relater i.e. lower the index more the diversification of crops and higher the index more the specializations under agricuilturally favorable condition such as suitable weather fertile soil mechanization availability of irrigation facilities the crop diversification is more while crop diversification decrease in the region unfavorable condition.

		1998	2003	2009	2013
Sr.	Name of Taluka	No. of crop	Index of diversification	No. of crop	Index of Diversification
1	Yawal	5	16	3	19
2	Chopda	4	20	3	25
3	Raver	4	26	5	25

Raver tahsil have high diversification is mostly due to high extension of canal irrigation so cultivators of these taluka have changed their attention from food grain to cash crops sugarcane banana and vegetable have ibcrease their p[ercentage in this taluka.

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New Trend in Research

Prof. Pratibha Tukaram patil, Prof.Anita R. Wankhede
(SES. College of education jalgaon.)

Abstract

Today is the era of research of research and technology. Every field needs Improvement and new techniques and skill. Various new trends of research are emerging in different fields.

This paper discussed about new trends in research in special education field in the age of science and technology role of student and teacher are vastly changed. There for it is necessary to take the research on different problems of special education will be discussed.

1. Distance education
2. Education technology
3. Human Right education
4. Parent education
5. Vocational education
6. Computer based modern education
7. Inclusive education
8. Special education

1.Introduction

Education psychology has brought to light individual differences the education institutes Differences the educational institute are no exception to it in every educational institute where common students are admitted some of them are special from others so the children who are different for common standard are called special student.

1. Distance education

Distance education for blind, handicap, mentally retarded students for special education.

Designing new courses - both academic and vocational-suitable to the special needs and abilities of the disabled. Offering awareness programmers for the parents the general public and the policy makers. Enhancing the quality of the existing training programmers for the personal working with the disabled.

2. Educational Technology:—

Use of educational technology for special education. Ex. Use of internet. Computer is such a thing there is no limitation to use computer form child to adult can use this

technology. For using this technology there is no need of physical completeness.

USE FOR COMPUTER TECHNOLOGY. IN SPECIAL EDUCATION:-

1) We can use net for special education.
2) Virtual class room
3) Through diagram
4) Individualized learning
5) Collaborative learning
6) Tools for educators & teacher trainees to innovate.
7) Virtual learning worlds
8) Providing instant feed back
9) Online communities
10) Quality of scale

3. Human Right education:

Human Right education for students of special education.

Human right are certain rights that are vested in every person by virtue of his/her being a human being no one gives us human rights but other people can take away our rights by violating them or by not implementing them.

This is because of the growing awareness all over the world including in India and movements towards recognizing new rights earlier human rights are like a seed. Now a day's human rights are growing rapidly.

4. Parent education:

Need of parent education for special education students this there parent.

Parent's education refers to a systematic and conceptually based programmed intended to impart information awareness or skills to the participants on aspects of parenting.

Parent's Educational ways:-

1. Teaching aids
2. Parents school
3.Parents group
4. Seminar
5. Parent school participate.

Parents Education projects

1. Parents meetings
2. Health education
3. Hobby education
4. Teachers parents education

5. vocational education

Use of vocational education for learners needing special education to complete their

day's needs. Special vocational education is instruction designed to help special students use their full learning ability. Teaching handicapped students requires special vocational skill trainer and teacher vocational training prepare sing the education student to hold a job.

6. Computer based modern education:-

Computer based education, video conferring E-learning and E-teaching , virtual classroom, teaching and learning for those who need special education.

1. Computer assisted learning
2. Computer assisted teaching
3. Computer assisted instruction
4. Computer aided instruction
5. Computer managed learning

Ways of computer based education for special education:-

1) Teleconfering
2) Video conferring
3) Interactive video
4) E-Learning
5) E-Teaching
6) Paperless library
7) Internet & E-mail
8) Virtual classroom

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Change Detection of land use of Waghur Basin by using Remote Sensing and GIS Technology

More R. A., Agone V. M. and Bhamare S. M.

ABSTRACT

Land use and land cover is an important component in understanding the interactions of the human activities with the environment and Land evaluation purpose, thus its necessary to be able to simulate changes. The Present paper attempted the change detection of land use during 1990 to 2015 on the basis of Remote Sensing data and GIS Software with the help of ArcGIS, ERDAS Software and Remote Sensing Data. The base map Land use and land Cover is prepared with the help of Landsat 5 TM in year 1990 and Landsat 8 year 2015. It is found that considerable change in land use and land covers have been detected during 1990 to 2015 on the Landsat Imagery. The present study of land use on a micro scale natural region of meso watershed like Waghur Basin. Amongst various parameters of the land uses following five classes have been considered in this study. Land under agriculture, Land under forest, Land under Built-up area, bare land and Land under water bodies. The catchment of Waghur Basin is 2485 sq.km and it extends between 20º 27' 32.04'' North latitude to 21º 05' 43.16'' North latitude and 74º 30' 7.35'' East to 76 º 05' 11.65 '' East longitudes. The study area lies under Monsoon climate region. It lies in Ajanta Satmala hilly area and becomes a good catchment in respect of rainfall.

Keywords: Land use Change detection, Land evaluation, Remote Sensing, GIS

Mr.R.A.More , Assistant Professor, SSVPS LK Dr.P.R.Ghogrey Science College, Dhule
Dr.V.M.Agone, Research Fellow, SSVPS LK Dr.P.R.Ghogrey Science College, Dhule
Dr.S.M.Bhamare, Former Professor, SSVPS LK Dr.P.R.Ghogrey Science College, Dhule
Corresponding email: vikramagone@gmail.com

Introduction:

With increasing population pressure on the land, the land utilization on land use has acquired a special significance in various populous countries including India since; past studies have made to assess the various aspects of land use to correlate with the agricultural crops with a view to increasing the productivity of the land to its maximum capacity (Singh, 1967). Land use and land cover (LULC) change is a major issue of global environment change. Scientific research community called f or substantive study of land use changes during the 1972 Stockholm Conference on the Human Environment , and again 20 years later, at the 1992 United Nations Conference on Environment and Development (UNCED). At the same time, International Geosphere and Biosphere Programme (IGBP) and International Human Dimension

Programme (IHDP) co organized a working group to set up research agenda and promote research activity for LULC changes. Land use / land cover mapping is essential component where in other parameters are integrated on the requirement basis to drive various developmental index for land and water resource. Land use refers to man's activities and the varied uses which are carried on over land and land cover refers to natural vegetation, water bodies, rock/soil, artificial cover and others noticed on the land (NRSA, 1989). Land Cover , defined as the assemblage of biotic and a biotic components on the earth's surface is one of the most crucial properties of the earth system. Land cover is that which covers the surf ace of the earth and land use describes how the land cover is modified. Land cover includes: water, snow, grassland, forest, and bare Soil. Land Use includes agricultural land, built up land, recreation area, wildlife management area etc. In this study to map out the status of land use land cover of Waghur Basin between 1990 and 2015 with a view to detecting the land use change. Remote Sensing data is very useful because of its synoptic view, repetitive coverage and real time data acquisition. The digital data in form of Landsat satellite imageries, therefore, enable to accurately compute various land cover / land use categories and helps in maintaining the spatial data infrastructure (SDI) which is very essential for monitoring urban expansion and change detections studies (Lo, 1981; Mukherjee, 1987; and Quarmby & Cushine, 1989). In other words, the remote sensing satellite data in multi-resolution and multispectral means to provide spatial information for land cover / land use at different levels for various aspects as built-up land, agricultural land, forests, wastelands and water bodies etc. So, the land cover / land use maps prepared using multi-date and multispectral data provides different levels of spatial information which are used in change detection studies (Burrough, 1986).

Application of remotely sensed data made possible to study the changes in land cover in less time, at low cost and with better accuracy (Kachhwaha, 1985) in association with Geographical Information System (GIS) that provide suitable platform for data analysis, update and retrieval (Star et al . 1997~ McCracker et al .1998~ Chilar, 2000). Space-borne remotely sensed data may be particularly useful in developing countries where recent and reliable spatial information is lacking (Dong et al. , 1997). Remote sensing techno logy and geographic information system (GIS) provide efficient methods f or analysis of land use issues and tools for land use planning and modeling. By understanding the driving forces of land use development in the past , managing the current situation with modern GIS tools, and modeling the future, one is able to develop plans for multiple uses of natural resources and nature conservation. The change in any form of land use is largely related either with the external forces and the pressure built-up within the system (Bisht and Kothyari , 2001).

The present study of land use on a micro scale natural region of meso watershed like Waghur Basin. Amongst various parameters of the land uses following five classes have been considered in this study. Land under agriculture, Land under forest, Land under Built-up area, bare land and Land under water bodies.

Study Area

The study area i.e. Waghur basin is the major southern tributary of river Tapi. Its source lies in Ajant Satmal hills at an elevation of 778 m above mean sea level. Waghur river flow from World famous Ajanta cave. The study area comes under the monsoon type of climate with marked season ability of rainfall.

It is classified as good catchments because it is hilly and intensive rainfall zone. On the Waghur Basin there is a dam constructed 12.5 km East from Jalgaon and it is benefited to Jalgaon City and many villages for drinking and irrigating purpose this major irrigation dam was constructed. Monsoon rainfall recorded for 64 years i.e. from 1950 to 2014 are available average monsoon rainfall is 809.3 mm. The catchments of the Waghur Basin is 2485 sq km and it extends between 20º 27' 32.04'' North latitude to 21º 05'43.16'' North latitude and 74º 30' 7.35'' East to 76 º 05' 11.65 '' East longitudes. The study area lies under monsoon climatic region. It lies in Ajanta Satmal hilly area and becomes good catchments in respect of rainfall.

Aim

The aim of this study is to produce a land use land cover map of Waghur Basine at different epochs in order to detect the changes.

Objectives

The following specific objectives will be pursued in order to achieve the aim above.

1) To create Land use map of Waghur Basine from Landsat satellite image.
2) To create a land use land cover classification scheme using supervised classification in ERDAS 9.2 and ArcGIS 9.3.1 software.
3) Understand the land use of Waghur basin.
4) To detect Land use Change between year 1990 to 2015.

Methods and Material

The aim of this paper is to detect the Land use / Land cover change from 1990 to 2015. The multi-spectral satellite data is used for supervised classification for prepare Land use map. The software ERDAS-9.2 and ArcGIS 9.3.1 is used for data processing. The data utilized is given in the following tables for the years 1990 and 2015. The Geographic Information System (GIS) and Remote Sensing (RS) tools have been applied to find out the land cover / land use changes over periods in the Waghur basin. Such as the ArcGIS and ERDAS have been used for geographical analysis, integration, and presentation of the spatial and non-spatial data for land cover / land use change detection. So, these tools are more effective for monitoring and modeling for land cover / land use changes.

Table1 Data Source and Acquisition (Remote Sensing data)

RS data	Date	Band
Landsat 5	Oct 1990	2,3,4
Landsat 8	Oct 2015	3,4,5

Landsat imaginary	Band combination	Date
True Color	1,2,3	Oct 1990
Fals Color	2,3,4	Oct 1990

Landsat imaginary	Band combination	Date
True Color	2,3,4	Oct 2015
Fals Color	3,4,5	Oct 2015

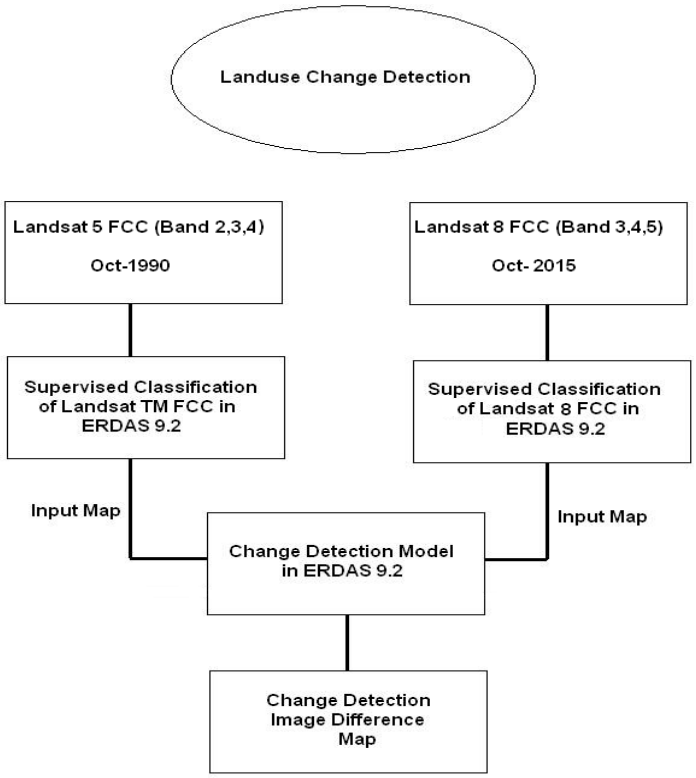

Figure 1 Methodology flow chart

Results and Discussion

The Land use maps of Waghur basin for both the years reveal five classes of Land use. Viz Land under agriculture, Land under forest, Land under Built-up area, bare land and Land under water bodies. The classified images obtained after preprocessing and supervised classification which are showing the land use and land cover of the Waghur basin are given in the following figure 2 These images provide the information about the land use pattern of the study area.

Table 2 Spatio-Temporal distribution of Land use of Waghur basin

Land use Type	Year 1990 Area (sq.km)	Area in %	Year 2015 Area (sq.km)	Area in %
Forest Land	310.71	12.50	283.82	11.42
Agriculture Land	987.45	39.74	1389.13	55.90
Bare Land	1152.5	46.38	744.5	29.96
Settlement	19.30	0.78	35.26	1.42
Water Bodies	15.04	0.61	32.29	1.30
Total Area	2485.00	100	2485.00	100

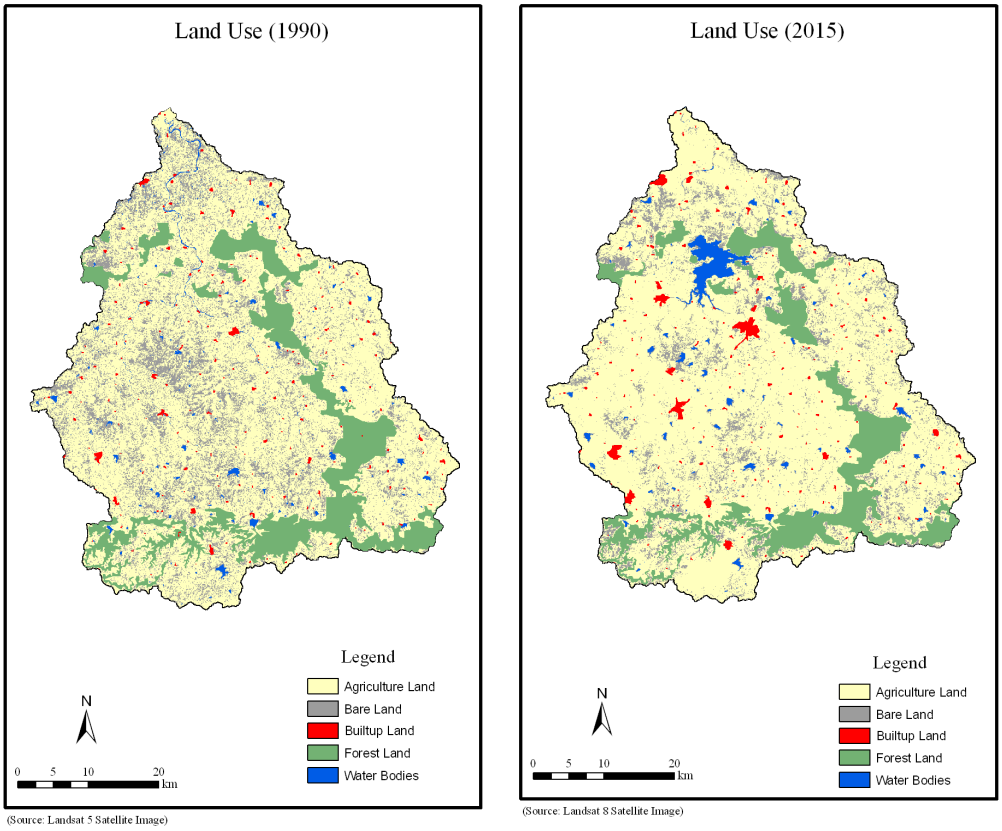

Figure 2 Land use map of Waghur basin 1990 & 2015

Table 3 Land use Change Detection during 1990 - 2015

Land use Type	Year 1990 Area (sq.km)	Year 2015 Area(sq.km)	Increase Area(sq.km)	Decrease Area(sq.km)
Forest Land	310.71	283.82		26.89
Agriculture Land	987.45	1389.13	401.68	
Bare Land	1152.50	744.50		408.00
Settlement	19.30	35.26	15.96	
Water Bodies	15.04	32.29	17.25	
Total Area	2485.00	2485.00		

Conclusion

This research work demonstrates the ability of GIS and Remote Sensing in capturing spatial-temporal data. Attempt was made to capture as accurate as possible five land use classes as they change through time. The five classes were distinctly produced for each study year but with more emphasis on Settlement and Agriculture land as it is a combination of anthropogenic activities that make up this class; and indeed, it is one that affects the other classes. However, the result of the work shows a rapid growth in Water bodies (17.25 km^2), Settlement (15.96 km^2) and Agriculture land (401.68 km^2) while rapid decrease in forest (26.89 km^2) and bare land (408 km^2) between 1990 and 2015.Above finding gives potential for land evaluation of Waghur basin.

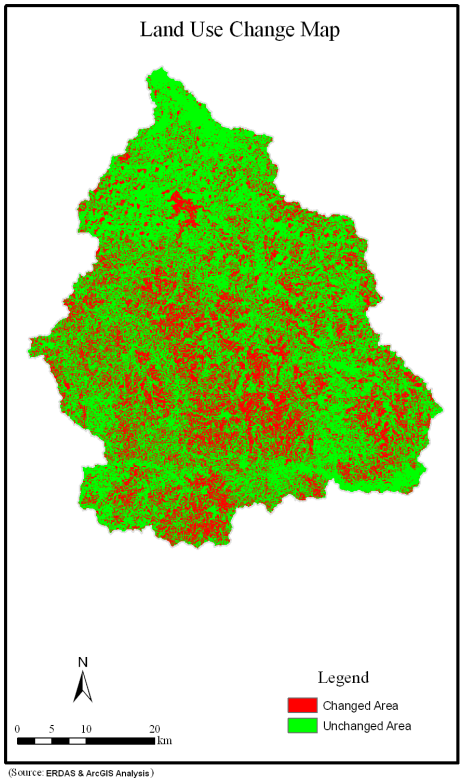

Figure 3 Land use change detection map

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