LINKAGE

Yashwantrao Chavan Warana Mahavidyalaya, Warananagar, Dist.-Kolhapur

And

Kankavli College, Kankavli, Dist- Sindhudurg.

Linkage is signed on 15th April, 2020 between

1. Yashwantrao Chavan Warana Mahavidyalaya, Warananagar - First Party. and
2. Department of Geography Kankavli College, Kankavli, Second Party

It is agreed by the First party and Second party to impart student and faculty exchange, sharing of human resources and infrastructure, study tours, educational content development, book editing, trainings and workshops, research publications, research to the students and to organize conference/seminars jointly. Both the parties have discussed in detail the areas of co-operation and mutually agreed to make the linkage. Now it has been agreed by and between both the parties with the following terms and conditions.

Terms and Conditions:

1) Both the parties will extend their facilities to each other in the areas of student and faculty exchange, sharing of human resources and infrastructure, study tours, educational content development, book editing, trainings and workshops, research publications, research to the students and to organize conference/seminars jointly.
2) No rental charges or any other incidental charges, unless mentioned, shall be paid by both the parties for using the infrastructure facilities of each other.

3) The books written, books edited, educational and research contents developed jointly, etc. will be published as a joint publication.
4) The IPR and patents produced out of the linkage will have equal rights of both the parties mentioned above.
5) The linkage will be valid for a period of five years starting from the date of signing this agreement and may be renewed for a further period of five years through mutual consent of parties.
6) This linkage may be terminated by either side by giving three months' notice to that effect in writing.

In witness whereof, the parties here have set these hands on the 15th April 2020.

Party	First Party	Second Party
Institute	**Yashwantrao Chavan Warana Mahavidyalaya, Warananagar, Dist.-Kolhapur**	Kankavli College, Kankavli, Dist-Sindhudurg
Signature		
Name & Designation	Dr. P. S. Raut **Head, Department of Geography**	Dr. B. L. Rathod **Head, Department of Geography**
Signature		
Name and designation	Dr. S. B. Shahapure **Principal**	Dr. Y. V. Mahalinge **Principal**
Stamp	PRINCIPAL Yashwantrao Chavan Warana Mahavidyalay, Warananagar, Dist. Kolhapur	**Principal** **Kankavli,College** **Kankavli**
Seal	YASHWANTRAO CHAVAN WARANA MAHAVIDYALAYA WARANANAGAR (M.S.) KOLHAPUR	KANKAVLI COLLEGE Kankavli

ROLE OF ECOLOGY IN AGRICULTURAL SUSTAINABLE DEVELOPMENT USING REMOTE SENSING TECHNIQUES

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Abstract

Remote Sensing is the science and art of obtaining information about an object, area, or phenomenon through the analysis of data acquired by a device that is not in contact with the object, area, or phenomenon under investigation.

Remote sensing data (the image) have been used to derive thematic information on various natural resources and environment. The type and level of information extracted depends on the expertise of the analyst and what he is 'looking for' in the data. For example remote sensing image of land can be used to derive information on vegetative cover, water bodies, land use pattern, geological structure, soil, etc.

Key words: - Ecology, Economics, Sustainable Development, Croplands, Green Revolution, New Techniques.

Introduction

India is an agricultural country; one third population depends on agriculture sector directly or indirectly. Agriculture continues to be the mainstays of the Indian economy. Hence, adequate production and even distribution of food has lately become a high priority global concern. With the changing agricultural scenario and global competition, there is a need of exploiting the available resources at maximum level. The development of new and improved varieties of plants and availability of such varieties to Indian farmers is of crucial importance for a sustained increase in agricultural productivity.

Soil is one of the most important natural resources of any country. The soil not only grows a variety of food and fodder crops required for men and animals but also produces raw materials for various agro-industries viz, sugar and starch factories, textile mills, canning and food processing units. It is a complex body showing many variations in depth, colour, composition and behavior. Every soil consists of hard materials called mineral matter, soft and spongy organic matter, water, air and living organisms.

The sustainable agriculture may be defined as any set of agronomic practices that are economically viable, environmentally safe, and socially acceptable. If a cropping system requires large inputs of fertilizer that leak from the system to pollute ground water, drinking supplies and distant coastal fisheries, the system may be sustainable economically as the long-term supply of fertilizer is stable and the economic cost of fertilizer is easily borne by larger grain production but it is not sustainable environmentally or socially, since it does not cover the cost of environmental damage or social costs. The organic agriculture focuses on "living soil", on

optimizing the use of biological processes and on avoiding the use of synthetic chemicals and fertilizers.

Aims And Objectives

1) To apply the modern techniques of Sustainable Development In Agricultural Using Remote Sensing Techniques
2) To study the need of sustainable of agriculture development in Indian economy.
3) Analysis and interpretation of remote sensing data for Agriculture.
4) To promote Socio-Economic development of the local community through micro- level planning in the study area.

Methodology Of The Study

The present study has been descriptive; the data for this study were obtained from secondary sources. The secondary has been collected from various references which already existed in published form; part of the paper is based on literature review the method comprising of collecting all the available papers relating to the them and selecting relevant papers/books for the review purpose. Selection of the paper is done on the basis of their relevance and contribution to the body of knowledge. The author has made an attempt to do primary reading of the selected papers which will constitute the core of this review study.

Remote sensing can play an important role towards generating a sustainable development plan of Agriculture. Use of satellite images is an effective techniques for study and classification of land resources in Agriculture.

The data collected through Primary and Secondary source will be processed and represented by GIS, GPS, Remote Sensing Software, Cartographical and statistical techniques. The various methods and techniques will be used to explain and analyse the relevant section of the study.

The methodology is divided into two parts

1) Field work components.
2) Laboratory components.

Agricultural Applications :-

The economy of most developing countries is mainly governed by agricultural. In India the agricultural sector sustains the livelihood of around 70% of the population and contributes to about 35% of the net national product. The major concern is to increase food grain production. Knowledge of food grain production well in advance of harvest enables the country to adopt suitable measures to meet the shortages, if any, and assist in policy making decisions like the level of buffer stock, imports, fixing of support prices, etc.

The applications remote sensing can be used to study the different aspects of agricultural like crop – type classification, yield forecasting and others.

Crop Type Classification :-

Crop types can be identified by their spectral response patterns and image texture. Successful identification of crops requires a knowledge of the developmental stages of each crop in the area to be inventoried. Because of changes in the crop characteristics during the growing season, it is

often desirable to use images acquired on several dates during the growing cycle for crop identification. Some parameters used for classification are:

1) Ground surface covered
2) Crowns of individual plants
3) Texture
4) Alignment and spacing
5) Evidence of irrigation etc.

Yield Forecasting :-

The conventional procedure for crop yield estimation by the Bureau of Economics and Statistics (BES) in India involves crop cutting experiments conducted during harvesting in the plots selected based on a pre designed sampling scheme using available ground data.

Crop yield forecasting using remote sensing is more complex, because of the high variability involved, crop yield is a function of various parameters like soil, weather, cultivation practice, fertilizers used, irrigation, date of sowing, etc.

Remote sensing observed data in the form of some kind of vegetation index can be correlated with crop yield, based on the actual field data. Thus, an empirical relationship can be established. On the other hand some bio-physical parameters which are derived based on remote sensing observation say leaf area index at the critical stage of plant growth.

Water Resource :-

Remote sensing data has been used in many applications related to water resources such as surface water body mapping, groundwater targeting, wet land inventory, flood monitoring, reservoir sedimentation etc. in False Colour composing (FCC) water bodies appear as different hues depending on their physical characteristics such as depth of water, turbidity, etc.

Some of the parameters amenable to remote sensing are the extent of water spread and its seasonal fluctuation, volume of water emergent and floating vegetation, etc.

Almost 85% of the rural water supply in India is depended on ground water. Remote sensing plays a vital role in delineating potential area of ground water occurrence for detailed exploration, thus reducing the cost and time involved in ground water exploration. Ground water occurs in porous and permeable rock formations called aquifers. Satellite data provide information about geomorphic features, structures, land use and rock types (in a few cases) indicating the presence of ground water. Some structural features that are indicators for potential ground water zones, viz., valley fills, alluvial pans dykes etc. appear in satellite imagery which helps in water detection

Conclusion

The conditions for development of sustainable agriculture are becoming more and more favorable. New opportunities are opening the eyes of farmers, development workers, researchers and policy makers. They now see the potential and importance of these practices not only for their direct economic interest but also as the basis of further intensification and ecological sustainability. This does not mean that agrochemicals can be abandoned. Also, research has an important role to play. Bankers and funders should think of how best to provide incentives and

credits, accessible to poor farmers and women, to make investment in dry land farming possible. As conditions for farming will continue to change, the key to sustainable agriculture is the capacity of farmers and all other actors in agricultural development, as well as the wider society, to learn, experiment, adapt and cooperate in an effective way. To conclude, a small farm management to improve productivity, profitability and sustainability of the farming system will go a long way to ensure the all round

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