

IIRR GeoPortal (<https://www.iirr-geoportal.in>) - A gateway to visualize spatial layers of IIRR

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Rice is the world's most important food crop and a primary source of food for more than half of the world's population. As population continues to grow and to achieve the targeted yield 120-130 million tonnes by 2025, increasing rice productivity is very important. India represents all kinds of diversity under which rice is grown across the globe. The new agricultural paradigm will have to be recast to take advantage of the wealth of knowledge available to achieve multiple goals of sustaining the food security. Current advances in ICT are making smart farms as DATA has become key element in Modern Agriculture to help growers in critical decision making. Data-Driven Agriculture like Remote Sensing, GIS and Proximity Sensing (Internet of Things i.e. sensors and other devices) drives agriculture to generate a big amount of valuable precise information. IIRR manages huge experimental database under All India Coordinated Rice Research Program. As agriculture is mainly based on spatial domain, use of geospatial technologies in agriculture has a big role in achieving the target production. With this background, IIRR GeoPortal has been developed to visualize Spatial layers developed at IIRR in the real world co-ordinates as ICAR-IIRR has been applying geospatial technologies to improve rice production since 2000.

METHODOLOGY

IIRR GeoPortal was developed using open source technologies such as GeoServer , GeoExt, ExtJS , HTML, CSS and QGIS. Spatial layers (shape files) like Rice area, productivity, distribution of important diseases of Rice crop etc.; were developed using ArcGIS package. QGIS was used as intermediate software to convert shape files to style files (.xml) which were further utilized for map publishing in GeoServer. GeoExt was employed to view the published maps in exact location on world map. ExtJS was used to design Map window for displaying the map, Toolbar for map viewing tools and Layer panel for selecting the layers. (<http://monde-geospatial.com/webmapping-application-using-postgis-geoserver-and-geoext-part-3/>; <http://docs.geoserver.org/stable/en/user/gettingstarted/shapefile-quickstart/index.html>)

RESULTS

The portal was successfully published online (<http://www.iirr-geoportal.in>) with the functionalities like visualising spatial layers with real world co-ordinates and finding longitudes and latitudes of any location, area and length of selected region. The following geo-referenced layers of rice crop were published in IIRR GeoPortal (Figs 1,2 &3)

- Funded centers of All India Cordinated Rice Improvement Program(AICRIP)
- Agro Climatic Zones- 15(Planning Commission)

- District level Rice Area and Yield (2005, 2010, 2015)
- Rice based Cropping Systems- Rice- Rice and Rice Wheat
- Soil Quality Index- Nalgonda district, Telangana
- Rice yield estimated from Spatial Rice DSS- Miryalaguda Mandal, Nalgonda Dt, Telangana
- Vulnerable temperature zones forecasted for 2018 and 2019 Kharif season
- Suitable Areas for Hybrid Seed Production- Favourable weeks during flowering time in Kharif and Rabi seasons
- Distribution and Severity of Important Diseases of Rice crop (10 diseases) over 3 decades

CONCLUSION

This portal is very useful for researchers and planners for analysing the rice productivity scenario over decades at district level. This portal will be easily customised to any other crop and further will be upgraded with spatial query modules to extract the interesting area of interest, spatial analysis and interoperability services.

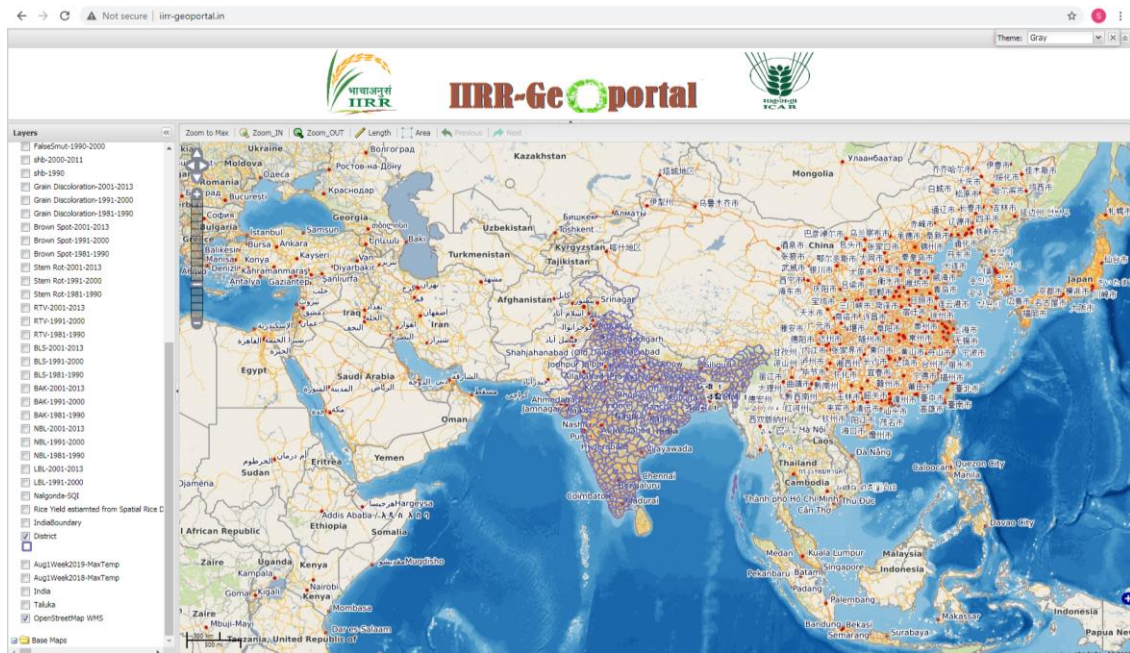


Fig. 1: Home page of IRR Geoportal

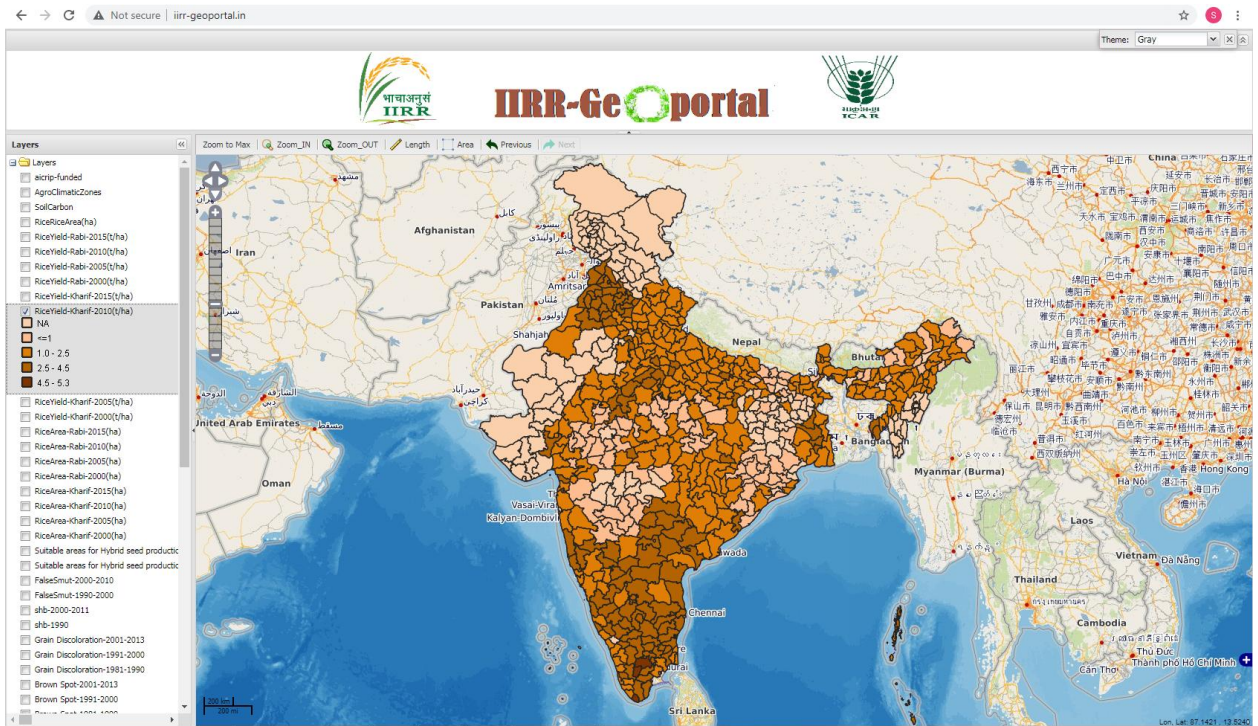


Fig. 2: Spatial Layer- Rice Yield (t/ha) during 2010 Kharif season

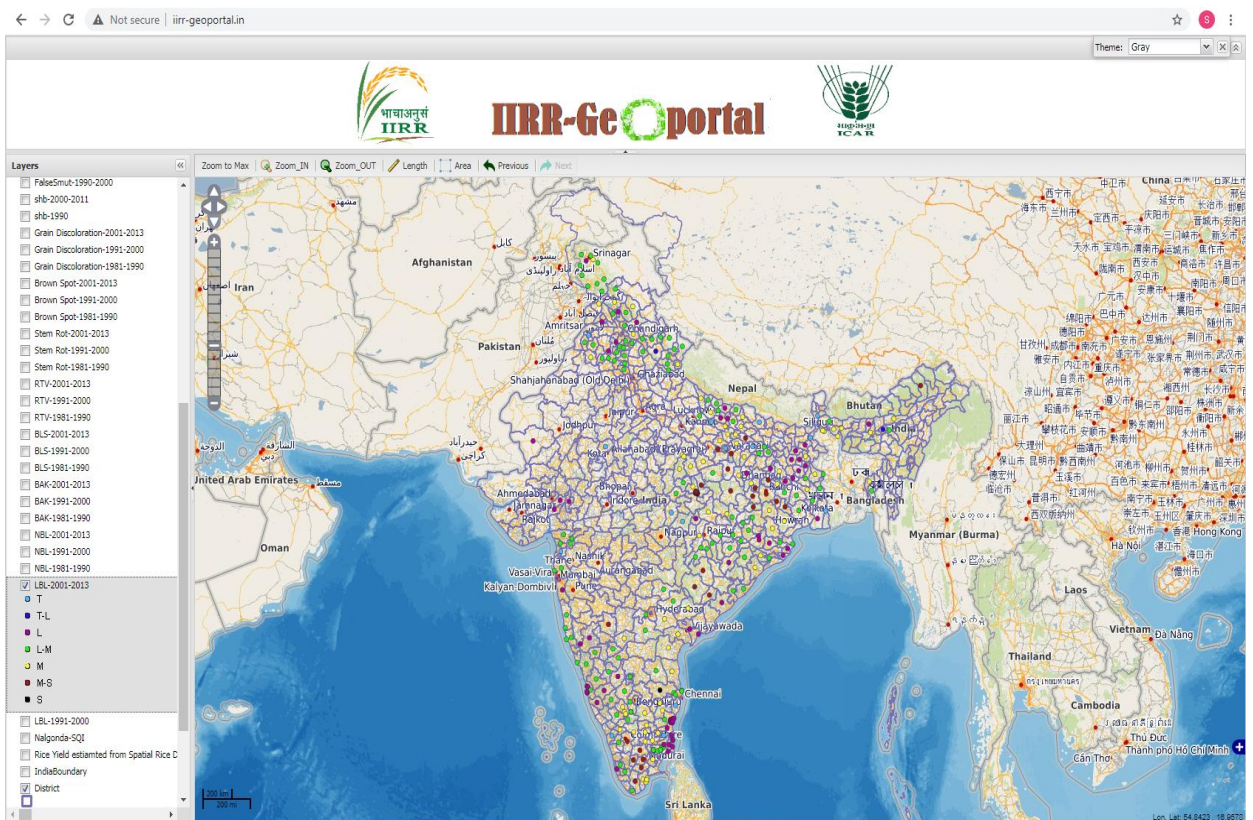


Fig. 3: Spatial Layer-Leaf Blast Distribution 2001-2013

REFERENCES

1. <http://monde-geospatial.com/webmapping-application-using-postgis-geoserver-and-geoext-part-3/> , WebMapping application using POSTGIS, Geoserver and GeoExt-Part 3, Monde Geospatial,30 August, 2015.
2. <http://docs.geoserver.org/stable/en/user/gettingstarted/shapefile-quickstart/index.html>, Geoserver