REMOTE SENSING & AI
A tool to combat climate change

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Vassar Labs, is a Technology company building products and solution for global problem of Climate Change impact on vulnerable sectors like Water, Cities, and Agriculture, by making use of latest technologies like IoT, AI/ML, GIS, Cloud computing, Remote Sensing, Big Data etc.
This graph from Munich RE shows events causing loss are becoming more frequent.
Decadal average: Number of people affected by disasters

Decadal figures are measured as the annual average over the subsequent ten-year period. Disasters include all geophysical, meteorological and climate events including earthquakes, volcanic activity, landslides, drought, wildfires, storms, and flooding. People affected are those requiring immediate assistance during an emergency situation.

News coverage of disasters

The data considers disasters occurring between 1968-2002 and their corresponding coverage in major US networks. It is evident that “spectacular” disasters receive more coverage.

Source: Our World in Data. 
Source: Eissen and Stridieberg (2007)

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TECHNOLOGY TO MONITOR AND MITIGATE CLIMATE CHANGE IMPACT

Satellite Data
Leveraging open source and commercially available satellite imagery, which now provides higher frequency and resolution

Artificial Intelligence
Achieving anonymous operations using AI on remote sensing data for least manual interventions and faster results
Disaster Risk Management
Identify various climate risk scenarios and simulate the real world behavior and enables post event assessment using open source satellite data.

Land Use Pattern
Identify trends of land usages to understand urbanization, city infrastructure, encroachment, water bodies, forests, natural resources and track illegal activities.

Precision Farming
Remote sensing based indexes like NDVI, NDWI, VCI in conjunction with weather observed and forecast data will enable to raise farm specific advisories for field preparation, sowing, pests, irrigation, crop health, yield and harvesting.

Water Resources
Creating digital twin for water systems replicating hydrological, hydrodynamic and conveyances to manage entire lifecycle of water.

Environmental Monitoring
Continuously monitor natural resources and sensitive areas. The AI with remote sensing helps monitoring GHG emission and identify ways to limit emissions and sequestrate carbon.

Green & Renewable Energy
Improve hydropower efficiency with digital twin and dynamic water flow management. Leverage remote sensing to understand solar farm potentials and current installed capacity along with wind energy farm monitoring & planning.

Leverage Remote Sensing for sustainable future
TOWARDS SUSTAINABILITY

1. NO POVERTY
2. ZERO HUNGER
6. CLEAN WATER AND SANITATION
7. AFFORDABLE AND CLEAN ENERGY

11. SUSTAINABLE CITIES AND COMMUNITIES
13. CLIMATE ACTION
15. LIFE ON LAND
SUSTAINABLE VILLAGES STRENGTHENING RURAL ECONOMY

Provides recommended and optional list of water conservation structures to validate through mobile app

• Using remote sensing and geo-intelligent mobile data

• Hydrological assessment in no time without subject matter expertise

• Making villages water independent
TRANSFORMING DROUGHT PRONE REGION FOR CULTIVATION

Decision support system for world’s biggest lift scheming lifting 240 TMC water annually

- Neal real time supply & demand visibility
- Remote sensing bases crop area and crop water demand assessment
- Planning lift/pump operations
- What if Scenario simulations
TRANSFORMING DROUGHT PRONE REGION FOR CULTIVATION

Near real-time monitoring of crop health using remote sensing indices like NDVI
Assessing irrigation performance in near real-time using wetness index derived from satellite data.
WATER GOVERNANCE MADE EASY WITH DIGITAL WATER JOURNEY

Near realtime visibility of entire water resource in the state of Andhra Pradesh enabling

• Remote management of water resources
• Empowering farmers to make water smart decisions
• Forecasting inflows for flood warnings
HYDROPOWER OPTIMIZATION FOR CLEAN ENERGY

Moderating reservoir flows for optimum hydropower productivity while meeting its key demands

- Neal real time visibility of inflows with an outlook for 5 days to plan turbine operations
- Catchment yield analysis
- Extreme event warnings
MONITORING CITY HEALTH FOR SUSTAINABILITY

City health and Infrastructure

Automatically identify changes for city health indicators like green cover, garbage points, water bodies, public lands, construction progress etc.
ASSESSING RISKS TO PREPARE FOR CLIMATE CHANGE

WEB BASED FLOOD RISK ASSESSMENT

The web GIS platform will allow users to navigate areas of interest and assess flood risks with respect to return periods, rainfall data or inundation heights. In addition, detailed loss prevention recommendations. This happens using high resolution satellite data with AI.
MONITORING EARTH SURFACE FOR CHANGES

SURFACE WATER BODIES

All Weather Tracking
Continuous all weather monitoring using Sentinel-1

Near Real-time Analysis
Monitoring of water bodies based against their storage on every 5 day interval

Intelligent Analytics
Actionable Insights on irrigation potential and health assessments

Alerts and Advisories
Timely alerts on storage, encroachment monitoring to facilitate protection
LAND USE INTELLIGENCE

**Autonomous change detection**
Automatically identify changes monthly, so that they don't go unnoticed saving from revenue loss

**Near real-time action**
Early identification of changes reduces resource requirement which results in financial saving

**Powerful Workflow**
Powerful workflow so that changes are verified and resolved in SLA limits
THANKS FOR WATCHING
Additional Slides ahead for our Projects

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PROJECT HIGHLIGHTS

20 DEPLOYMENTS IN INDIA
For solutions relating to water, agriculture, disaster management and smart city

15 STATE LEVEL PROJECTS
5 AT PAN INDIA SCALE

9 INTERNATIONAL PROJECTS
For Digital Transformation and AI implementations including fortune 500 companies

RETAIL, OIL & GAS, SUPPLY CHAIN, LOGISTICS
ESG, CARBON ACCOUNTING
CLIENT’S
INDIA WRIS
Visualizing different water resource information at country level on a single window.

INDIA GEC
Automation of estimation of dynamic ground water resources, which include web-based application.

APWRIMS
An integrated water resource management system based on hydrological modeling to provide real time visibility on water resources.

NARMADA CONTROL AUTHORITY
A water accounting model which can be used as both a planning and a low flow season operation.

GANGA DISTT PERFORMANCE
GDPMS will give the districts’ ranking along with producing the GIS-MIS Reports

KLIP
The system integrated near real time data leverages AI/ML module for planning lift operations.
Kerala WRIS
Integrate all water resources information on an integrated platform, which can be used to make key decisions.

APPRRD
Integrated Water Shed Management system at gram panchayat level using ICT, GIS and smart phone solution.

NEWRIB
GIS visualization of various static, spatial and temporal data related to water, along with various satellite-based layers added into it.

watershed planning and Management
GIS based decision support system which streamlines processes of planning, prioritizing and sanctioning construction of water and soil.

CWMI 3.0
A system to ingest data from various sources and calculate the rankings, providing interactive reports in both GIS and MIS.
AGRICULTURE

APAIMS
Comprehensive agriculture information and management system which eliminates silos and unifies the workflows.

APIIATP
To collect and store data, monitor and track all the activities under APIIATP as per World Bank norms.

HAIMS
A Comprehensive Farmer Database, implementation of scientific crop planning and harvesting assessment.

CAMS
Visualize information at multiple canal hierarchy level in an interactive way.
SMART CITY

APDMA
Bringing together GIS data to provide property tax assessment and improve municipal administration.

BLUIS
Authorized system developed using AI and ML for identifying encroachments on government lands and taking corrective actions.

WB AMRUT
Near real-time monitoring of city infrastructures (like SWM, greenspace, etc.) for smarter governance.
**DISASTER**

**KFEWS**
A comprehensive platform that generates flow forecasts and resulting inundation at various control locations identified across the Periyar river basin.

**APDIMS**
Data Integration with weather forecast systems, becomes available to create extreme weather dashboard and generate automatic advisories.

**FLOOD RISK MANAGEMENT**
Web based flood risk information, visualization and management platform with what if scenarios, and collaborations on flood protection measures.
DIGITAL TRANSFORMATION

OIL & GAS SERVICES
A real-time solution based on synthesizing IoT data and building AI/ML models that provides insights on different assets.

PULP & PAPER CLIENT (F500)
AI-based order fulfillment built on the capabilities of Augmented Customer Experience maximized fulfillment of KPIs.

LOGISTICS CLIENT (EU)
Built a platform solution leveraging on-board IoT devices and digitized end-to-end fleet operations which improved utilization rate.

TELECOMMUNICATION CLIENT
Developed a solution that clustered customer personas based on AI algorithms and recommended customer engagement mechanisms.

LOGISTICS SERVICES CLIENT
Developed a product passport that automated recording the compliance process and provided a unified tracking mechanism of goods.

MACMILLAN
The platform tracks the amount of paper being used across distribution channels and its quality.
aquaWISE™ PLATFORM

DATA COLLECTION
- Field Sensors
- Satellite & GIS
- Drone Surveys
- Predictive Models
- Experimental Data
- API Integrations
- Mobile App Survey
- Existing Databases
- PLC & SCADA Integration

INDEX
- Reservoirs
- MI Tanks
- Ground Water
- Soil & Moisture
- Rainfall
- Rivers & Canal
- Forecast
- Losses
- Crop Planning
- Industrial
- Residential
- Soil Type
- Forests
- Wetlands
- Sewage
- Flora & Fauna
- Pollution
- Distribution

NEAR REAL-TIME DIGITAL TWIN

CENTRAL COMMAND & CONTROL CENTER

ASSET MONITORING WITH PREVENTIVE AND PREDICTIVE MAINTENANCE

AI MODELS
- WATER BUDGET & AUDIT
- WATER CONSERVATION MGMT
- GROUNDWATER MANAGEMENT
- RESERVOIRS & CANALS
- WATER DISTRIBUTION
- MI TANK MONITORING
- INTERBASIN TRANSFER

AGRO-CLIMATIC ZONES
- AGRI ADVISORIES
- HYDROPOWER
- FLOOD & DROUGHT
- CASCADE OF MI TANKS
- LIFT SCHEME OPTIMIZATION
- WATER USE EFFICIENCY

Water ERP Geoportal
Enable high performing business processes through actionable intelligence

User centric smart dashboards that provide multi level business insights

Deep expertise in the application of data science and big data modelling

Able to ingest data from different sensors, machine and business systems
COMPLETED

THANKS FOR WATCHING

Lets Discuss Way Forward

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