Workshop on BEST PRACTICES under IWMP

Use of Space Images & IT solutions in Watershed Monitoring

National Remote Sensing Centre
ISRO, Hyderabad
03 Sep, 2014
National level M & E of IWMP

Objectives

• Use Satellite data & GIS platform for planning / M&E
• Baseline Satellite images for all watersheds
• Uplinking of DPRs for all watersheds – Ref. Data
• Online M&E of all watersheds – Mobile & IT
• Periodic Satellite images for Change & Impacts
• Enable technological tools for Participatory M&E
• Integrated Web Portal Platform for All-Inclusive M&E
Sujala Watershed Project - Learnings

Modern Technology
- Remote Sensing
  - Geographical Information System (GIS)
  - Management Information System (MIS)
  - SATCOM

Effectively used for
- Planning
- Implementation
- Monitoring & Evaluation
- Impact Assessment
- Capacity Building
Uniqueness of Sujala M&E

- Focus is on Outcome, Impacts & Sustainability
- Blend of Modern tools (RS, GIS, MIS) and ground monitoring system
- Concurrent Process Monitoring
- Emphasis on learning aspects
- Independent External Agency
- Integral part of the project’s day to day activities rather than periodic off-line activity
Satellite Remote Sensing

Impact Assessment

M&E

Ground Based

Input – Output Monitoring

Process Monitoring

Implementation of MIS/GIS Package at local level
- Database creation
- Data Flow
- Data Synthesis
- Monitoring at all levels of project
- Database update & Report generation on weekly basis
- AUDIO Conference

District Level Aggregation & Synthesis
- Cluster of microwatershed databases
- Creation by NGOs and Core agency
Participatory Action Plan Preparation

GIS Inputs (Beneficiary wise details)

Satellite Inputs (Resource Maps)

LU/LC
Water
Drainage
Soil
Basemap
Parcel

Community Aspirations (Stake holder needs)

Field Survey

Action Plan

GIS Inputs (Beneficiary wise details)
Satellite Based Monitoring of Farm Pond Implementation

Before Treatment

During Treatment

Farm Pond Sizes:
21 X 21 X 3 m
15 X 15 X 3 m

Kumudavathi SWS, Kurudi MWS, Kolar Dist.

After Treatment
CPR Treatment (Afforestation)

Before

Managundi SWS, Dharwad District

After

Bio-mass increase
IWMP Monitoring & Evaluation – A Framework

Bhuvan Geoportal for Comprehensive M&E of IWMP

1. Data Loggers - Field
2. Program Monitors
(Agencies - Ministry/Project Directors.....)

Potential State-level MIS

National Level MIS of NIC

Mobile Apps for Field data

Online Field data upload

WebSolution Estimates for Field structures

Beta Site on Bhuan-IWMP Ready for deployment
Satellite Images for Monitoring & Evaluation

- National level framework
- Baseline satellite images
- Two images in a year for Monitoring
- Online tools for Change Analysis
- M&E - 10 Broad indicators
- Field data from Smartphones
Synchronisation with Multiple Mobile Data

GIS Functionality for Network usage

A client-server based GIS solution through a Web Based approach for Display and query of natural resources database at field level

Map Server

GIS & Database Server

Data transfer

Web Client

R E Q U E S T

R E S P O N S E

Digital Map/Geodatabase on RDBMS

GPS/GPRS & Wifi are the technologies of choice for real-time info update directly from the field
Bhuvan — The National Web Geoportal

- Online Shape file Creation
- Terrain Profile & 3D Fly Through
- Urban Design Tools
- Multi-Lingual (English | Hindi | Tamil | Telugu | Gujarati | Marati | Kannada)
- Downloads (CartoDEM, AWiFS, LISS III Ortho)

Uniqueness of Bhuvan

- Availability of Seamless High Resolution & Multi-Sensor Data from IRS Satellites
- 2D and 3D Visualisation tools
- Rich Thematic Information
- Weather & Ocean Services
- Collaboration /Community Participation
- OGC Web Services

Adapted for IWMP M&E

Data Archive

Visualization

Thematic Services

Geo-Processing

Bhuvan – The National Web Geoportal

Welcome to Bhuvan

Bhuvan is a Geographic Information System (GIS) platform developed by ISRO to provide various services for mapping and remote sensing applications. It offers seamless high-resolution data, rich thematic information, and collaboration opportunities. The platform supports multi-lingual services and provides downloadable datasets.

Availabe Services:
- 3D Geographic Models
- New Updates

Visualization Data Archive

Thematic Services

Geo-Processing

Online Shape file Creation

Terrain Profile & 3D Fly Through

Urban Design Tools

Multi-Lingual (English, Hindi, Tamil, Telugu, Gujarati, Marathi, Kannada)

Collaboration /Community Participation

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# Thematic Maps Services

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1:50,000

1:10,000

Visualization
Simple Geospatial Query for Monitoring

- All Watersheds – National level
- All Watersheds – State level
- All Watersheds – District level
- Watershed of Choice for details

Summary Report generation at each level

Status Highlight:  
- Approved
- In-Progress
- Complete
IWMP Programs Summary and Statistics

The main objectives of the IWMP are to restore the ecological balance by harnessing, conserving and developing degraded natural resources such as soil, vegetative cover and water. The outcomes are prevention of soil run-off, regeneration of natural vegetation, rain water harvesting and recharging of the ground water table. This enables multi-cropping and the introduction of diverse agro-based activities, which help to provide sustainable livelihoods to the people residing in the watershed area. Bhuvan provides platform for the users to showcase their applications through spatial mashups.

Statistics

Statistics State-wise, Year-wise, District-wise, Project-wise can be summarized

State: [Select State]

Get Summary

Summary Reports

Statistics and Summary of the Watershed Project can be obtained either State-wise/Year-wise/District-wise and also Information about the Indicators available for each Watershed Project on Click of the "Watershed Project" in Project-wise summary.

<table>
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Statistics

State: KARNATAKA  Year: Select Year

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Statistics
Statistics State-wise, Year-wise, District-wise, Project-wise can be summarized

State: KARNATAKA Year: 2011-12 District: Select District

Get Summary

Summary Reports

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Statistics
Statistics State-wise, Year-wise, District-wise, Project-wise can be summarized

State: KARNATAKA  Year: 2011-12  District: CHITRADURGA

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Statistics

State-wise, District-wise, Year-wise, Project-wise, Time-series.
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GIS Layers of Watershed – Geospatial Query

- Selected layers for display
- Cadastral Overlay, if made available from States
Data Upload Options for Watersheds from Data Provider

- BASELINE DATA;
- DPR;
- ONLINE ACTION PLAN;
- ONLINE STATUS UPDATE;
- MOBILE BASED FIELD STATUS
Field Data Collection using Smart Phone
Mobile data on Bhuvan Server – For view/Analysis
ThankYou