Project Monitoring Through GIS

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Monitoring Irrigation Projects

- Process of collecting information about Irrigation projects analyzing these in relation to execution, so that deviations are minimal

- IP created in a project by identifying & mapping of irrigation canal networks

- Tagging status of completion of the entire conveyance & distribution system, irrigation & drainage structures

Objectives

- Set performance standards
- Ensure implementation of construction program
- Compare actual physical & financial achievements with set targets
- Identify deviations, shortfalls, lagging areas & their effect on overall implementation program and inter-related activities and analyze their causes
- Suggest corrective measures for overcoming bottlenecks
- Review the project, suggest modifications in implementation procedures, program and targets
- Compile the information on financial & physical status

Stages of monitoring

1. Preliminary preparations
2. Field visit
3. Collection of information & review of status of project
4. Wrap up meeting with Project Authorities
5. Preparation of status Report
6. Follow up of action points

Irrigation Potential

- Ultimate potential, potential created up to last year program for current year & achievement.
- Reasons for lag in potential
- Status of utilization *vrs* creation
- Statement of distributary-wise Ultimate Potential & Potential Created

STATUS REPORT PARA

PART - I *Executive Summary*

Para 1 Project in brief

(Location, components, benefits, estimated cost, year of approval, inter-state aspects, year of start, targetted date of completion, external source of funding,)

Para 2 Organizational and Management aspects

(Adequacy of org set-up & physical & financial program)

Para 3 PHYSICAL PROGRESS (our concern)

(% completion of various components & achievement of potential.)

Para 4 Financial progress

(Latest expenditure details, outlays for the current plan/year.)

Para 5 Critical issues in focus

(critical issues needing immediate attention of Govt/Project Authorities.)

PART – II

- **Project components as being executed**
- **Changes in the scope**

APPROACH OF MONITORING THROUGH GIS AND RS

- Mapping of **existing** irrigation infrastructure in project
- Comparing with **proposed** irrigation infrastructure,
- Assessing IP created in project command.

APPROACH OF MONITORING THROUGH GIS AND RS

- **Study of toposheet**
- **Path/row** determination –utility software of NRSC
- Masking study area- vector polygon
- Acquisition of **High resolution CARTOSAT digital satellite data**
- Field database on irrigation infrastructure and Irrigation Potential
- Mosaicking of **CARTOSAT** satellite data

Steps in Monitoring in GIS

1. Field data collection- Maps, T chart of canal network, CCA-IP proposed, IP created as on specified date
2. CARTOSAT data acquisition
3. Field database creation on IP and Irrigation infrastructure- aqueducts, super passages, syphons, H.P. drains, road/cart/foot bridges
4. CARTOSAT database creation- mosaic and subset
5. Geo- database creation- Creation of all vector layers along with attributes
6. Mapping of Irrigation infrastructure and base layers
7. Assessment of Irrig infrastructure & IP- Comparison of proposed & satellite derived IP based on hydraulic connectivity
8. Ground truth verification
9. Preparation of report encompassing synopsis of analysis

Different scenarios

- **Canal completed-** canal length = field design, If length do not match exactly, - 98% for long canals or 97% for short canals
- **Canal short in length**
- **Gaps in middle reaches-** Whenever gaps exist in different stretches of the canal. length of canal continuous from off-take is only considered for IP assessment.
- **Gaps due to pending structures -** discontinuous due to pending structures, canal incomplete. Length of canal continuous from off-take considered for IP.
- **No off-take connectivity-** Whenever a canal is not connected to its parent canal even the canal is constructed this is taken as incomplete.
- **Canal pending-** If a canal is not identified in the satellite image as per field design, it is incomplete.

IRRIGATION POTENTIAL CREATED- Inputs reqd

- Proposed length of canal
- Satellite derived lengths; physical progress of canal construction for corresponding canal
- IP proposed under each canal
- Gaps existing in different stretches of canal network,
- No of gaps & lengths, their chainage derived hydraulically connected length of a particular canal.
- No of DPOs (Direct Pipe Outlet), their contribution to the IP as per field data; chainages – to assess Hyd. Connnectivity.

Estimation of IP under various canals

- IP of **minors & DPOs** hydraulically connected & completed are summed up to arrive at total IP created under the **distributary.**
- IP of **Distributaries & DPOs** hyd connected & completed are summed up - IP created under **Branch canal**.
- All the IP of **Branch Canals & DPOs** hyd connected and completed are summed up to IP created under **Main Canal.**
- **IP of Main Canals and DPOs hyd connected & completed are summed up to total IP created under Project**

Please Note

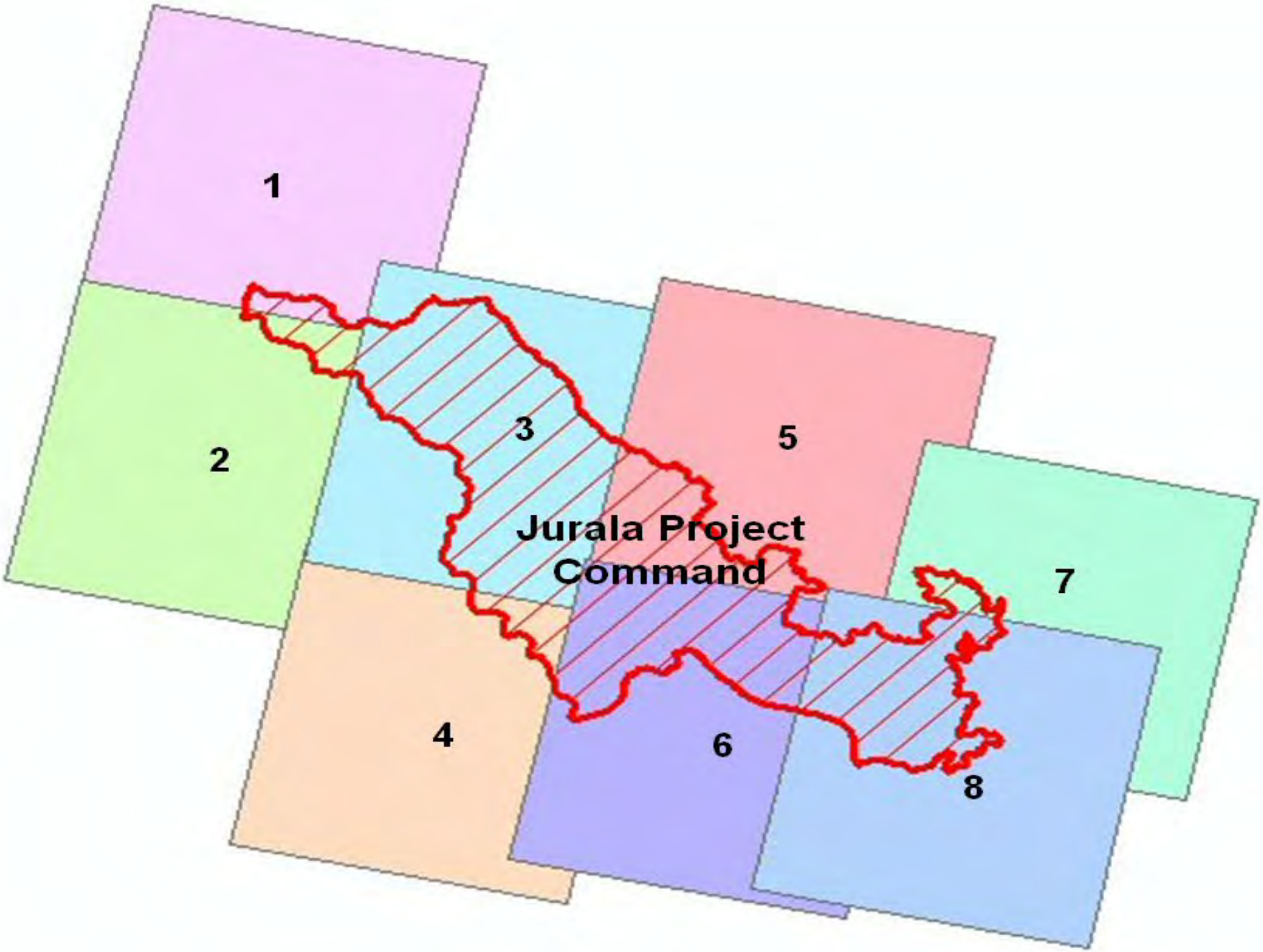
- **Balance IP = proposed IP - IP created under each canal**
- **All the IP values of minors and DPOs which are hydraulically connected and completed are summed up to arrive at the total IP created under the minor.**
- **If there are no DPOs, the IP created is estimated proportionally based on the hydraulically connected length of canal**

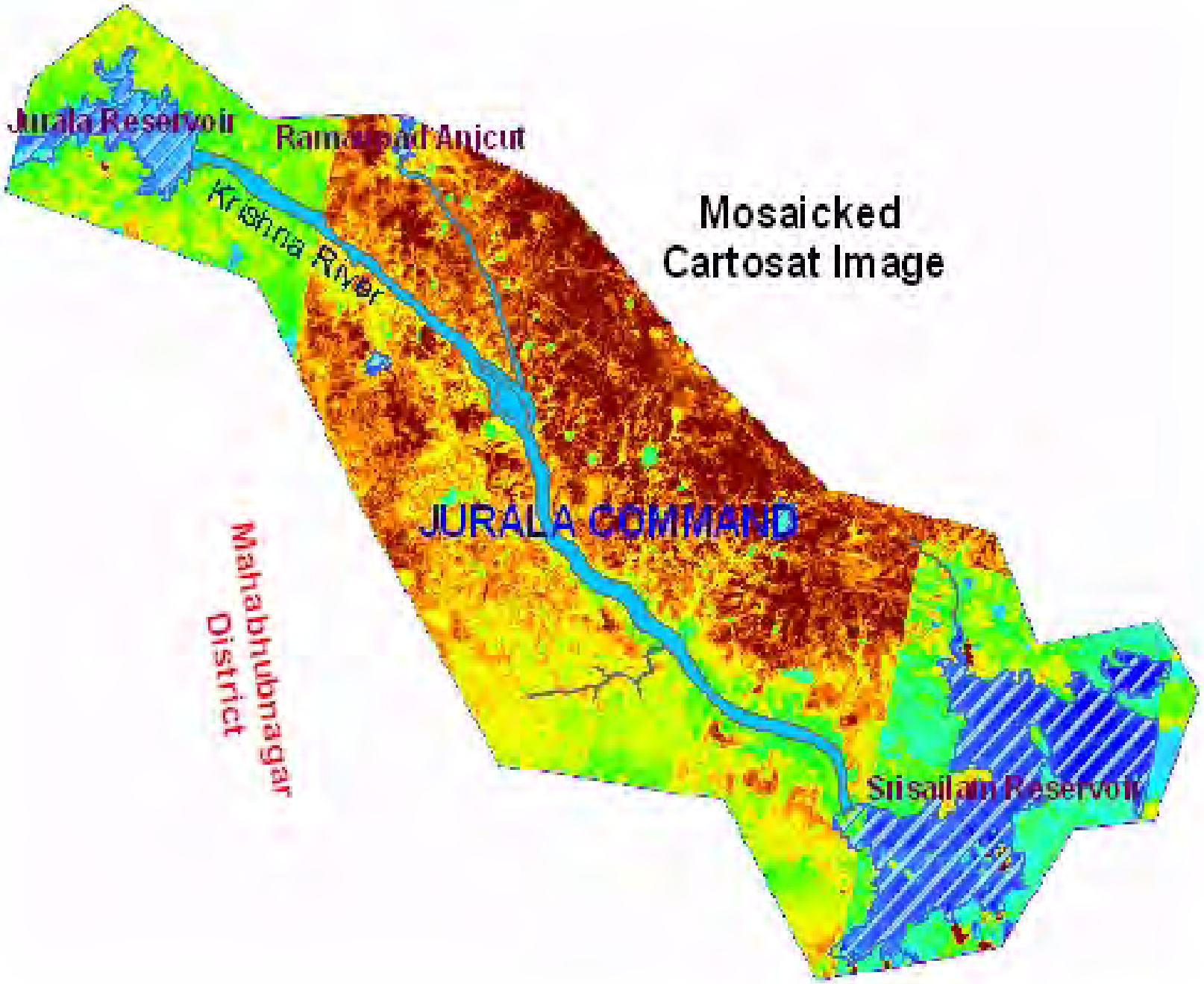
Example - 1

- Proposed **IP** = 250 ha
- Proposed length : 3 km
- Satellite derived : 2.5 km
- *(canal is not connected to main)*
- Satellite derived IP= 250 ha* 0/3.0 =0 ha
- Status: **Incomplete** – *Not connected to Distributary*

Example- 2

- Proposed **IP** = 150 ha
- Proposed length : 2 km
- Satellite derived : 1.5 km
- *(canal complete up to 1 km, & hydraulically connected)*
- Satellite derived IP= 150 ha* 1.0/2.0 = 75 ha
- Status: **Incomplete**
- DPO 2 (25 ha)


1
2
3
4
5
6
7
8
Jurala Project
Command


Jurala Reservoir
Ramapad Anicut
Krishna River
Mosaicked
Cartosat Image
JURALA COMMAND
Mahabubnagar
District
Srisailam Reservoir

INDEX MAP

N

Project Monitoring Through GIS-NWA

Jurala Reservoir

Ramanpad Anicut

Uppachetti Vagu

Island

KRISHNA RIVER

Gopaldinne Tank

Laxshaman sagar Vagu

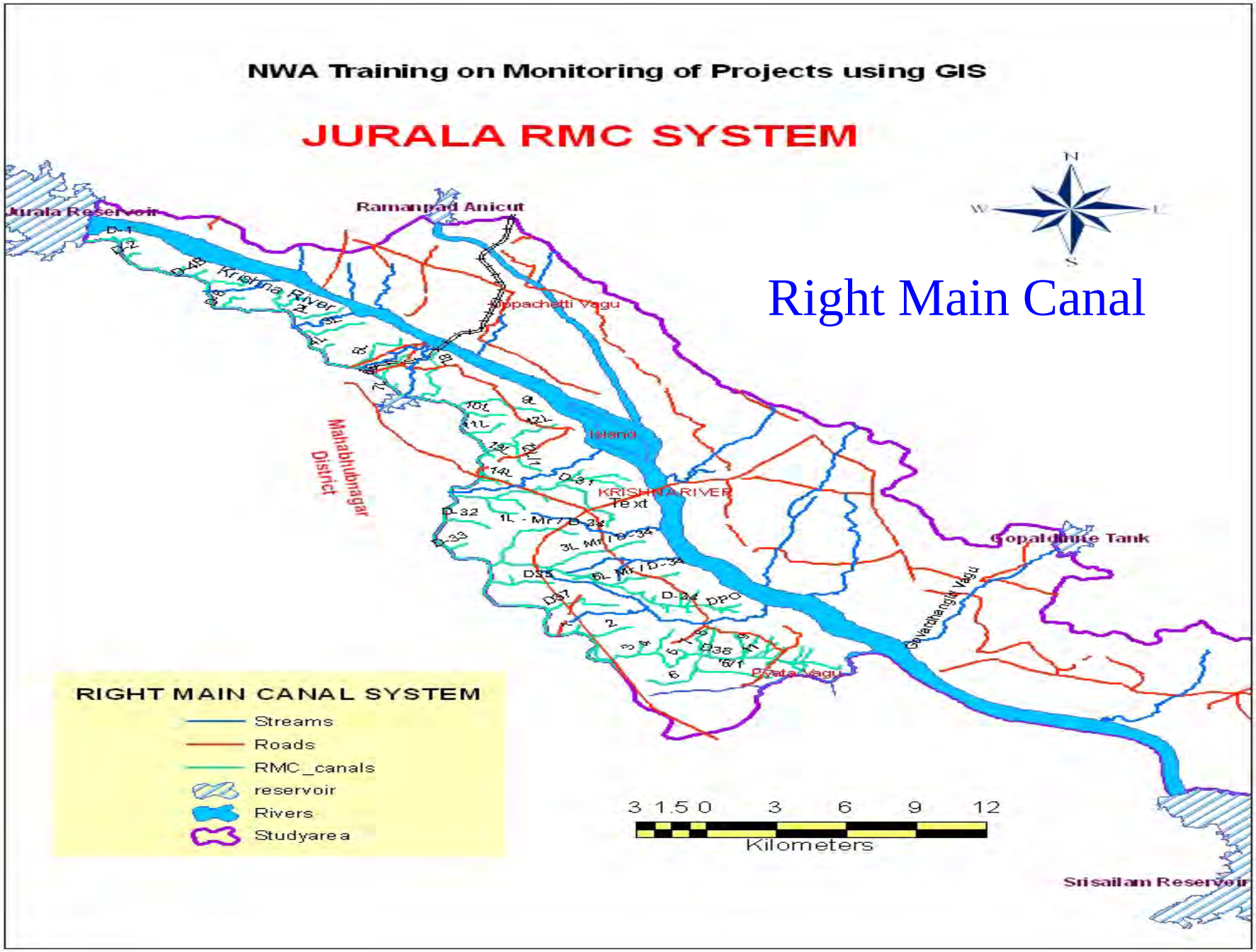
Laxshaman sagar Vagu

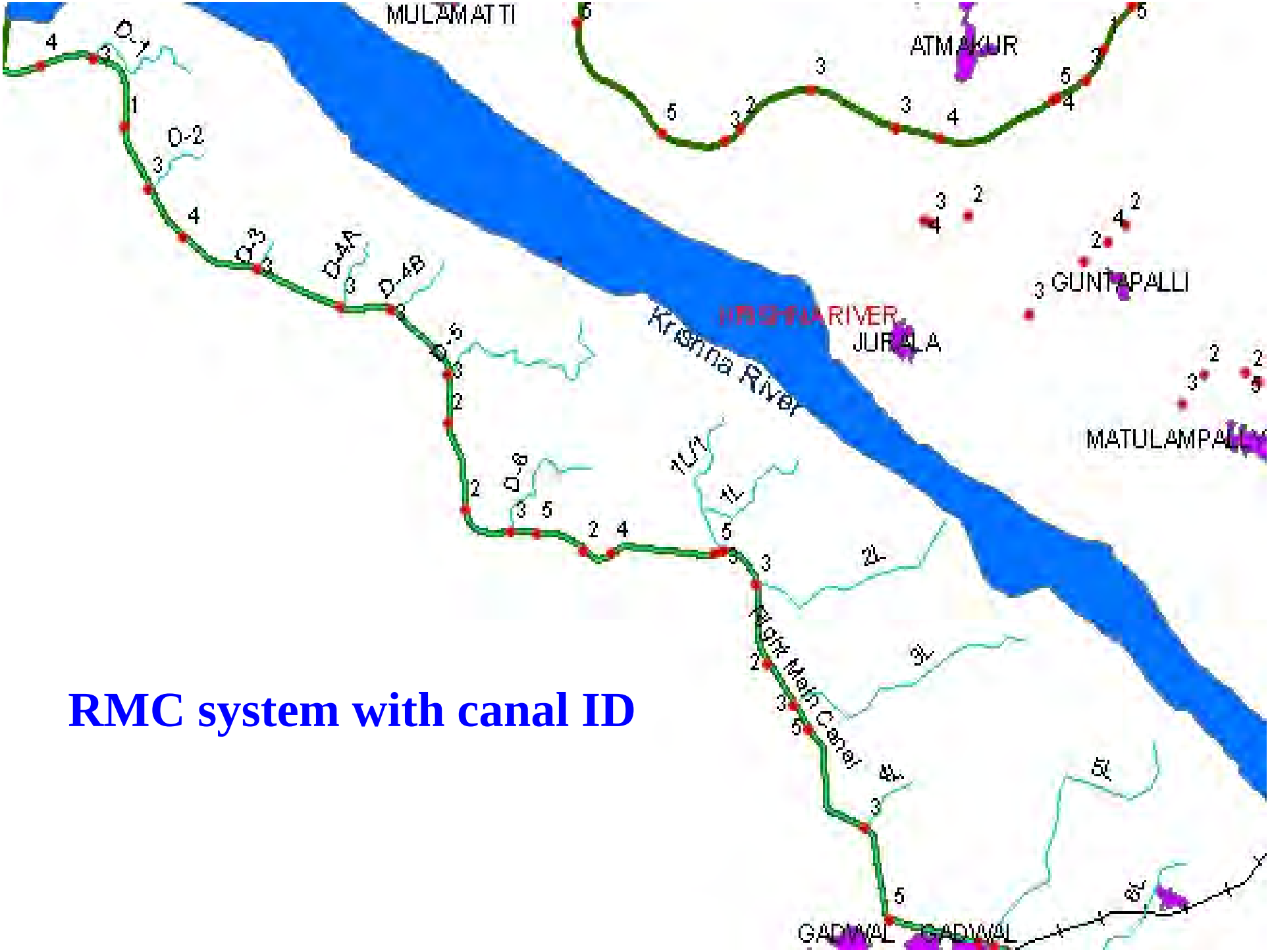
Pyata Vagu

Srisailam Reservoir

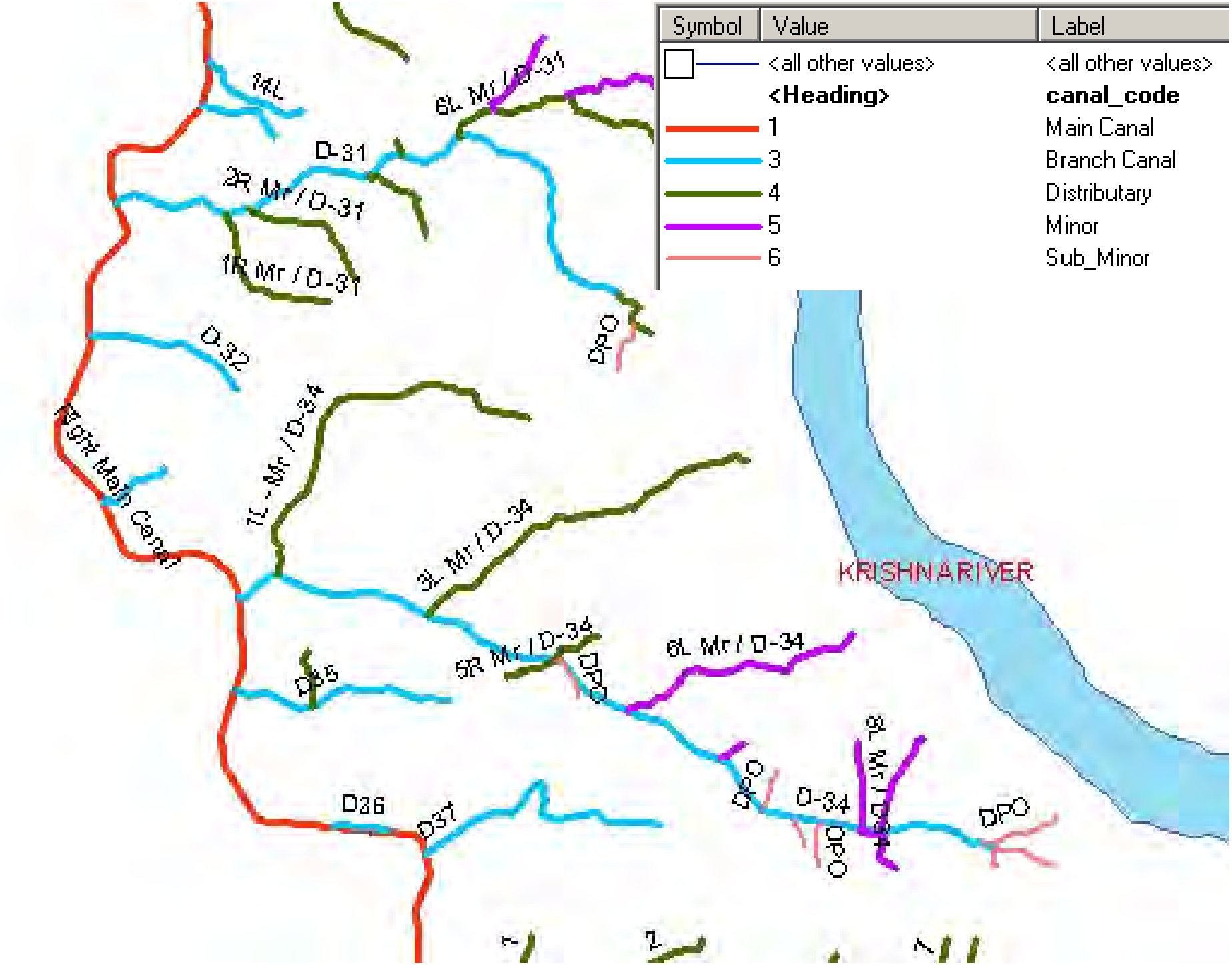
0 3,625 7,250 14,500 21,750 29,000

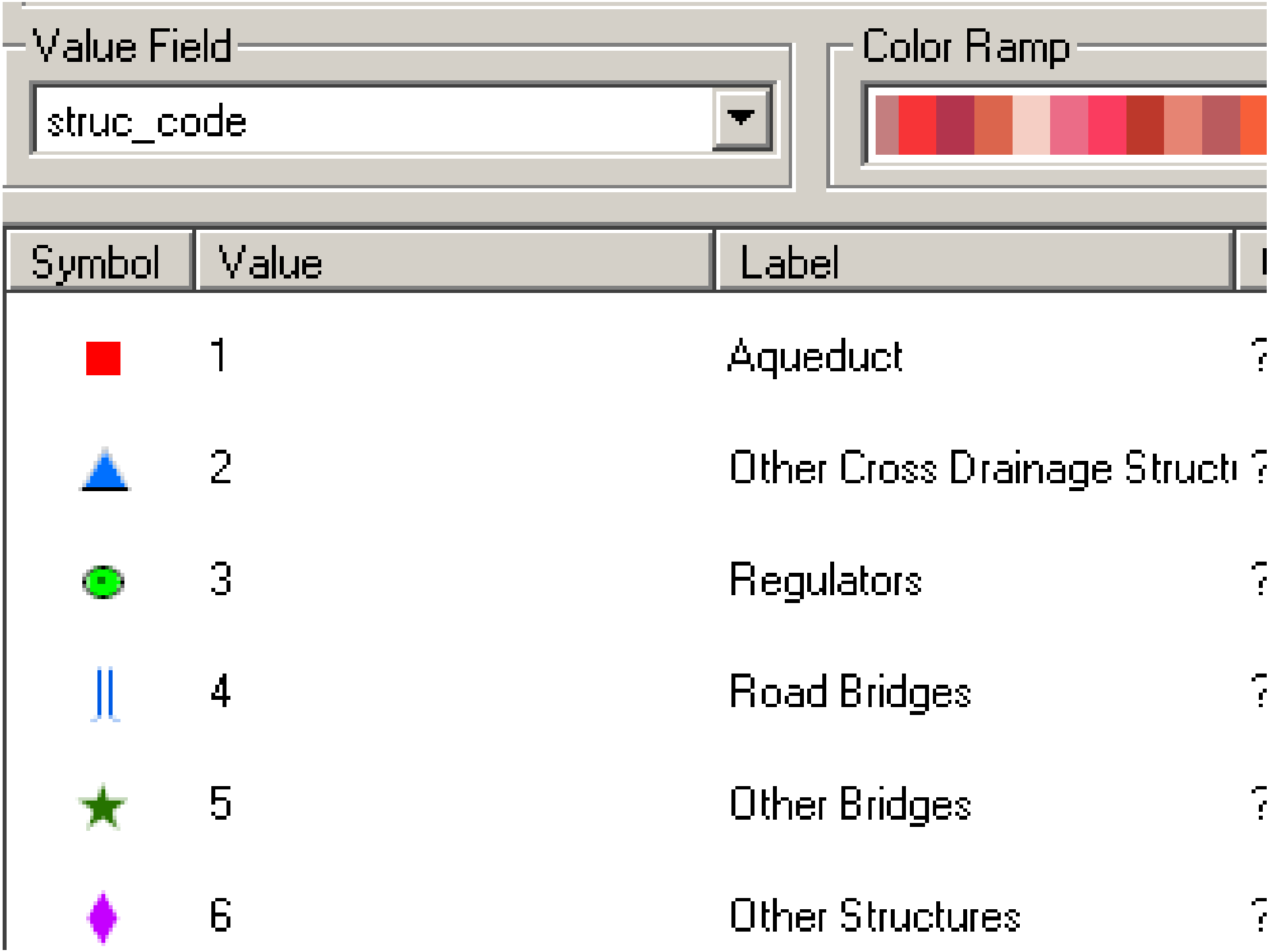
Meters


NWA Training on Monitoring of Projects using GIS
JURALA RMC SYSTEM
Right Main Canal
Jurala Reservoir
Ramanpad Anicut
Krishna River
Gopalchitti Vagu
Mahabhubnagar District
Island
KRISHNA RIVER
Text
Gopaldinne Tank
Gavarchinagili Vagu
Pyata Vagu
Srisailam Reservoir
N
S
W
E
RIGHT MAIN CANAL SYSTEM
Streams
Roads
RMC_canals
reservoir
Rivers
Studyarea
3 1.5 0 3 6 9 12
Kilometers



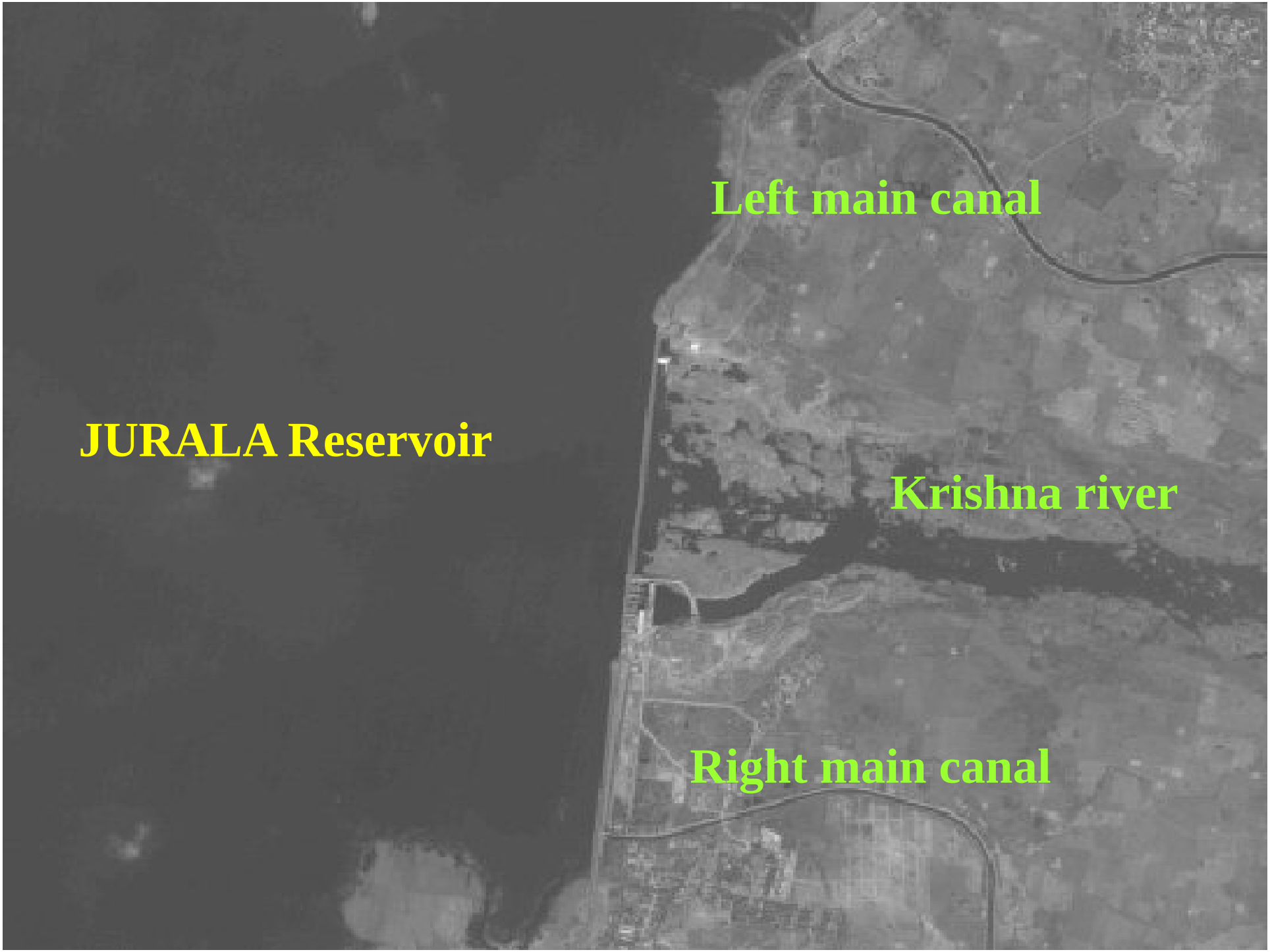
RMC system with canal ID


Symbol
Value
Label
<all other values>
<all other values>
<Heading>
canal_code
1
Main Canal
3
Branch Canal
4
Distributary
5
Minor
6
Sub_Minor
KRISHNARIVER
D-31
2R Mr / D-31
1R Mr / D-31
6L Mr / D-31
D-32
Right Main Canal
7L Mr / D-34
3L Mr / D-34
5R Mr / D-34
6L Mr / D-34
8L Mr / D-34
D-34
D26
D27
DPO


Value Field
struc_code
Color Ramp
Symbol
Value
Label
1
Aqueduct
2
Other Cross Drainage Struct
3
Regulators
4
Road Bridges
5
Other Bridges
6
Other Structures


6L Mr /D-31
Minor


8R Minor / Dy.31


Left main canal
JURALA Reservoir
Krishna river
Right main canal


JURALA Dam


Right main canal


Right main canal


Right Main Canal
D-31


Distributary

LET US DO IT PRACTICALLY