Progress in implementing the Asia-Pacific Plan of Action on Space Applications for Sustainable Development (2018-2030): Sri Lanka

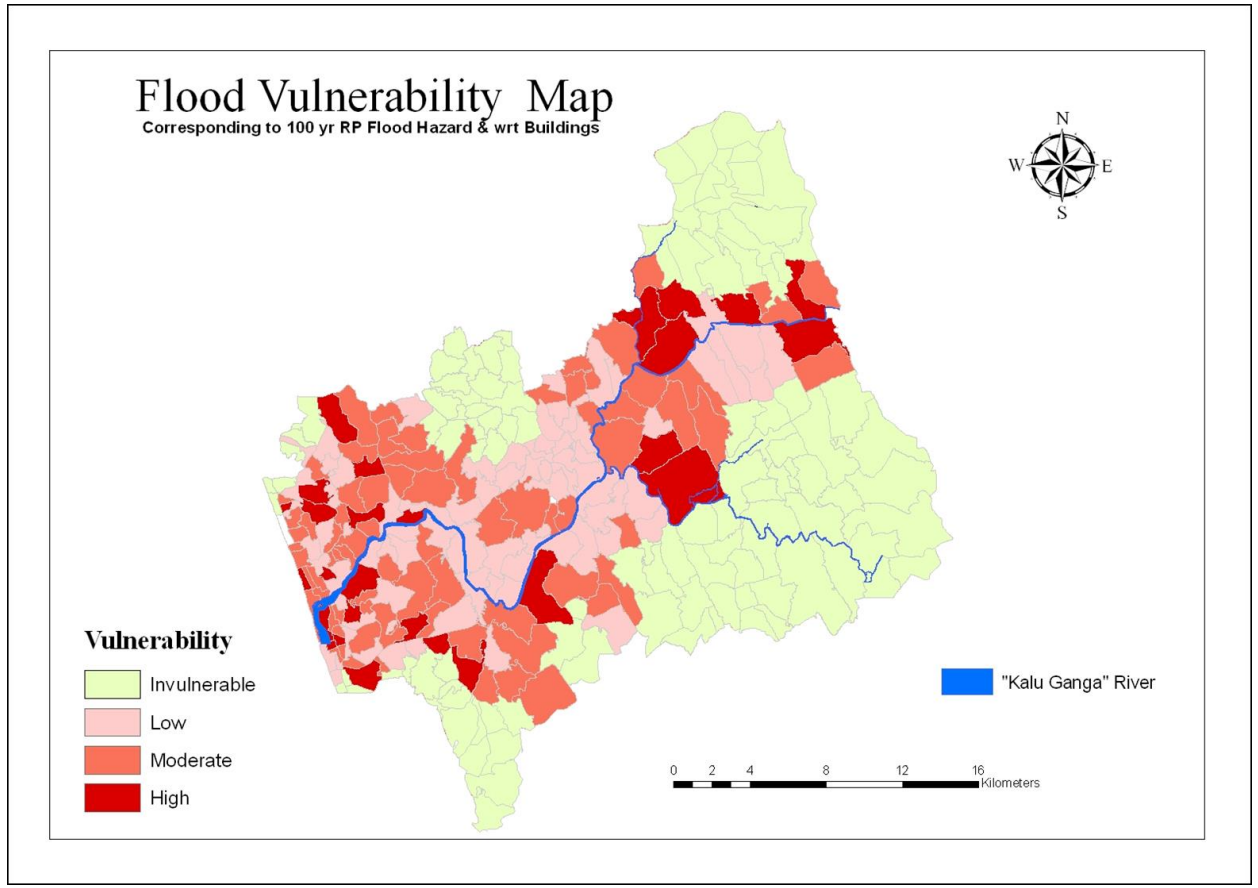
Eng. (Dr.) Sanath Panawennage

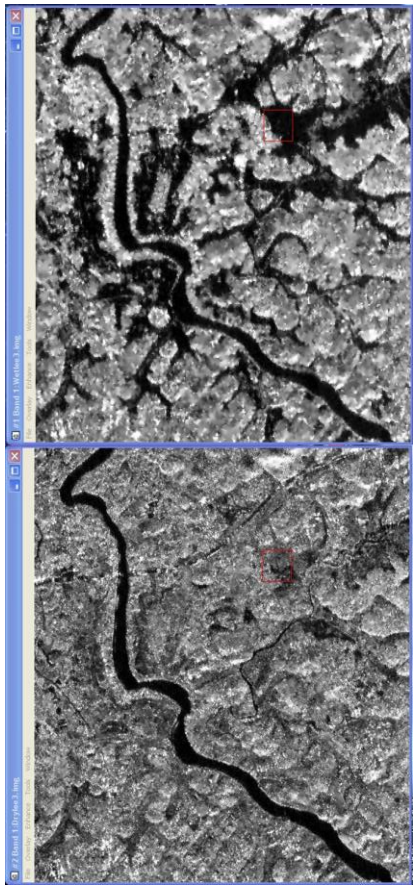
ICC-29, Seoul, Republic of Korea, Sept 2-4, 2025

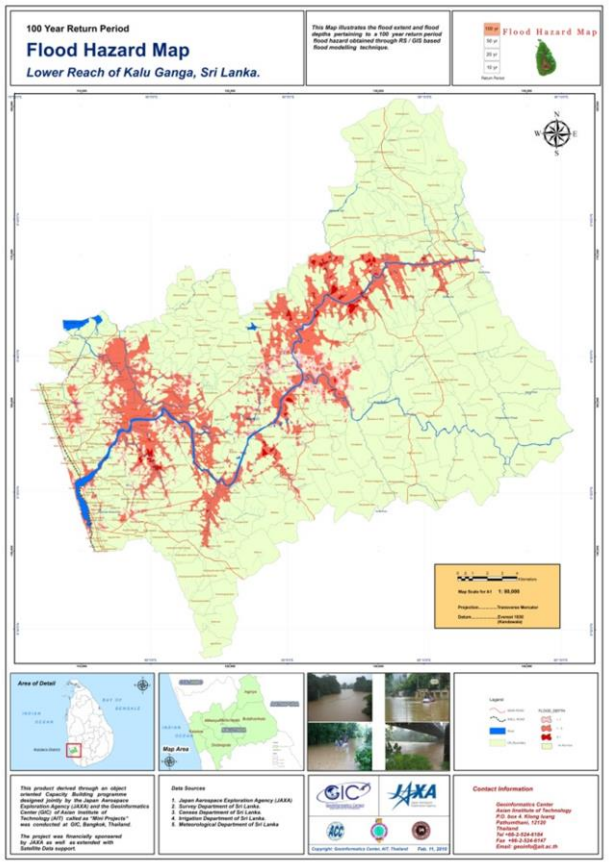
Examples from the thematic Area ‘Disaster Risk Reduction and Resilience’

DISASTER RISK REDUCTION AND RESILIENCE

Agency	Application/s	SDG Target	PoA Sub-thematic Area
National Building Research Organization	Landslide hazard zonation mapping and landslide inventory mapping. Monitoring of slope movements and land subsidence.	SDG Target 11.5	Risk Reduction Disaster Assessment
Geological Survey and Mines Bureau	Use of VSAT for data acquisition from seismic-monitoring stations		
Disaster Management Centre	Activation of the International Charter during disasters (mainly Floods and Landslides)	Sendai Framework targets 1,2,3,4	Emergency Response Disaster Assessment
Multiple (Dept of Agrarian Development, Dept of Census and Statistics, and ACCIMT)	Cultivated Paddy Area Identification & Rice Yield Prediction Using Free Remote Sensing Data	SDG Target 2.4	Food Production
Department of Agriculture	Soil degradation mapping		







An analysis of the flood risk in lower Kalu-Ganga River Basin with respect to the Population and Physical vulnerability in support of flood relief and mitigation (a pilot project carried out by ACCIMT)

Examples from the thematic Area ‘Management of Natural Resources’

MANAGEMENT OF NATURAL RESOURCES

Agency	Application/s	SDG Target	PoA Sub-thematic Area/s
Department of Irrigation	Water resources mapping flooded area mapping and drought-affected area mapping ***SatGPT introduced in 2025***	6.1,6.4,6.5,6.6	Water resource management
Department of Agriculture	development of river basin management plans, watershed management, and cascade system evaluation	6.4,6.5	
Department of Agrarian Development	Development of river basin management plans, identification of vulnerable cascaded reservoirs and river basins	6.4,6.5	
Department of Forest Conservation	Monitoring of Forest Cover and Forest Degradation; Mapping of forest cover and natural vegetation of Sri Lanka (every 5 years); Mapping tree cover density of Sri Lanka; Monitoring mangroves	15.1,15.2,15.3, 15.4,15.5	Forests Land use change Land Degradation and Desertification

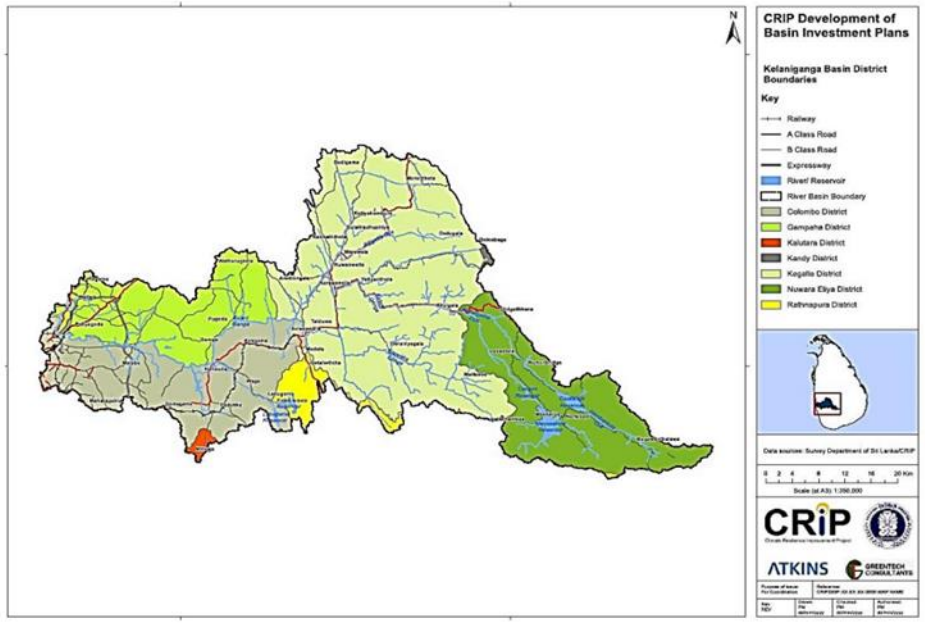


Fig 2 - District Boundaries of Kelani Basin (CRIP, 2018)

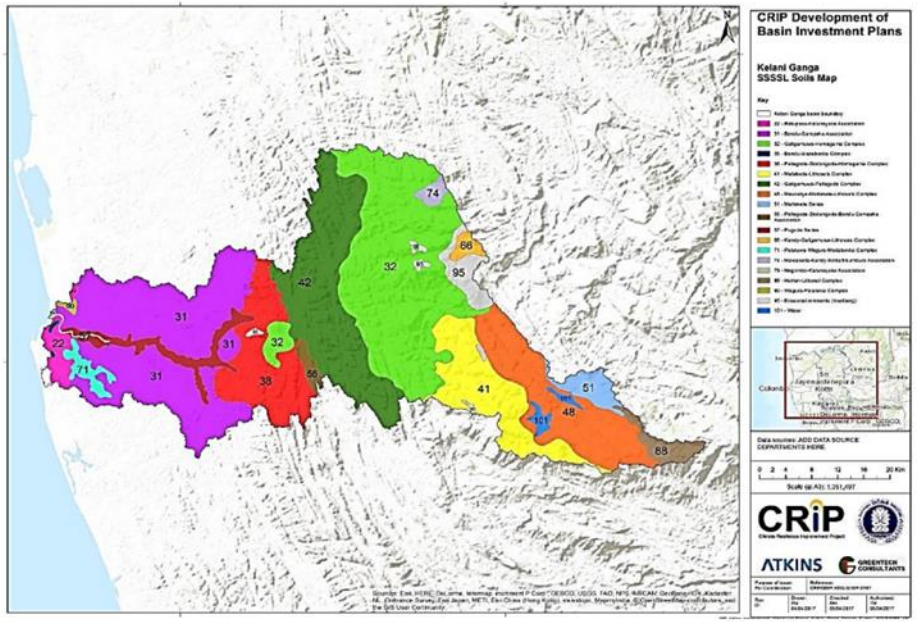


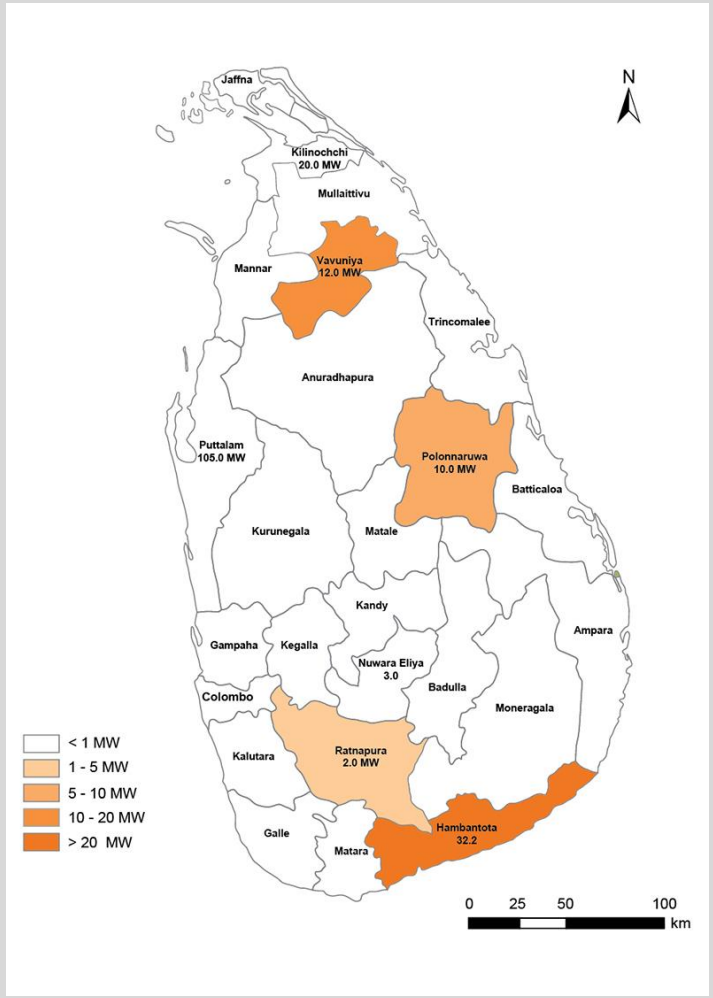
Fig 3 - Soil map of Kelani Basin (CRIP, 2017)

District Boundaries and the Soil Map of a Major River Basin – Kelani River

MANAGEMENT OF NATURAL RESOURCES

Agency	Application/s	SDG Target	PoA Sub-thematic Area/s
National Physical Planning Dept	RS/GIS Applications for mapping and modelling of urban and peri-urban settlements	9.4, 11.4,11.6,11.b	Infrastructure Urban Planning
Geological Survey and Mines Bureau	Use of satellite and aerial imagery for monitoring of illegal mining Use of freely available satellite images for mapping and mineral exploration	12.2	Consumption and Production
Department of Fisheries and Aquatic Resources	Vessel Monitoring System (VMS)	14.4	Sustainable Fisheries
National Aquatic Resources Agency	Potential Fishing Zone Forecasting	14.1,14.2,14.4	Sustainable Fisheries
Marine Environment Protection Authority	Use of EO Data for marine pollution monitoring	14.1,14.2	Marine Ecosystems Coastal Ecosystems

An Example from thematic Area 'Energy'





All the renewable energy development activities are implemented based on the resources identified and mapped. Renewable energy resource maps developed for the 5 resources: solar, wind, biomass, hydro and wave energy by combining different geospatial layers using the weighted overlay method in ArcGIS. This has been used by the Sustainable Energy Authority to determine the potential locations and to prioritize the sites for wind and solar power development.

Number of actions undertaken in the six thematic areas:

A total of,

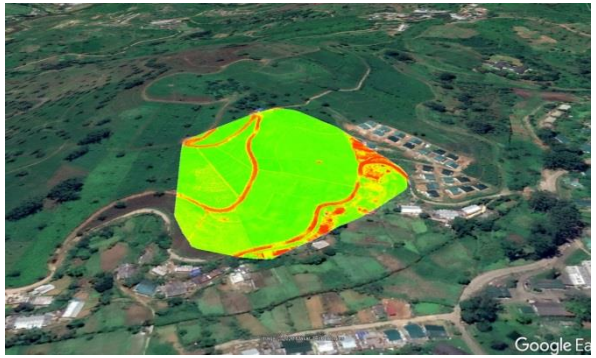
- Nine (9) actions in support of SDGs pertaining to the thematic area of Disaster Risk Reduction and Resilience
- Thirty two (32) actions in support of SDGs pertaining to the thematic area of 'Management of Natural Resources'
- six (6) actions in support of SDGs pertaining to the thematic area of Connectivity
- four (4) actions in support of SDGs pertaining to the thematic area of Social Development
- six (6) actions in support of SDGs pertaining to the thematic area of Energy
- Seven (7) actions in support of SDGs pertaining to the thematic area of Climate Change

have been undertaken by relevant sectoral agencies (as of 2024).

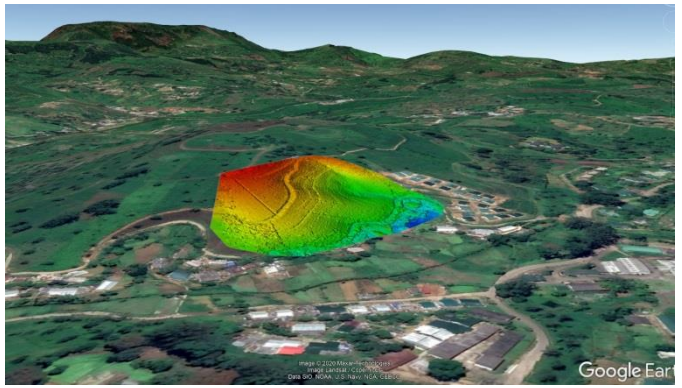
Innovative Applications integrating space with other digital technologies

Precision Agriculture for Tea Plantations

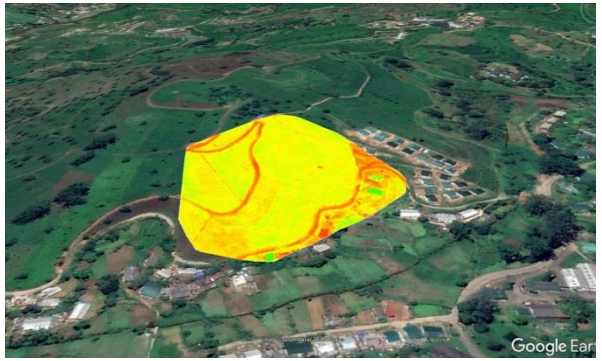




Normalized Difference Vegetation Index



Digital Surface Model

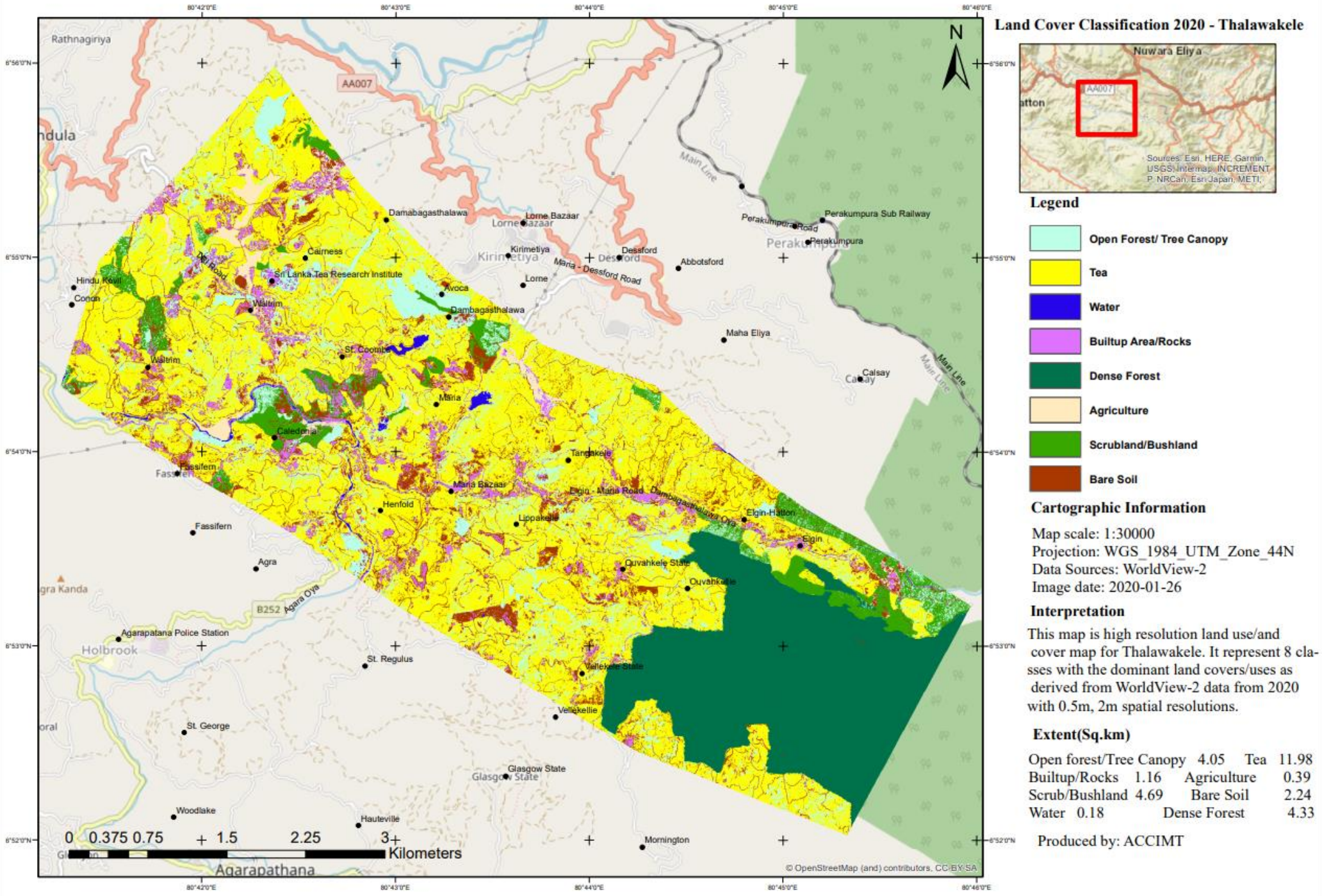


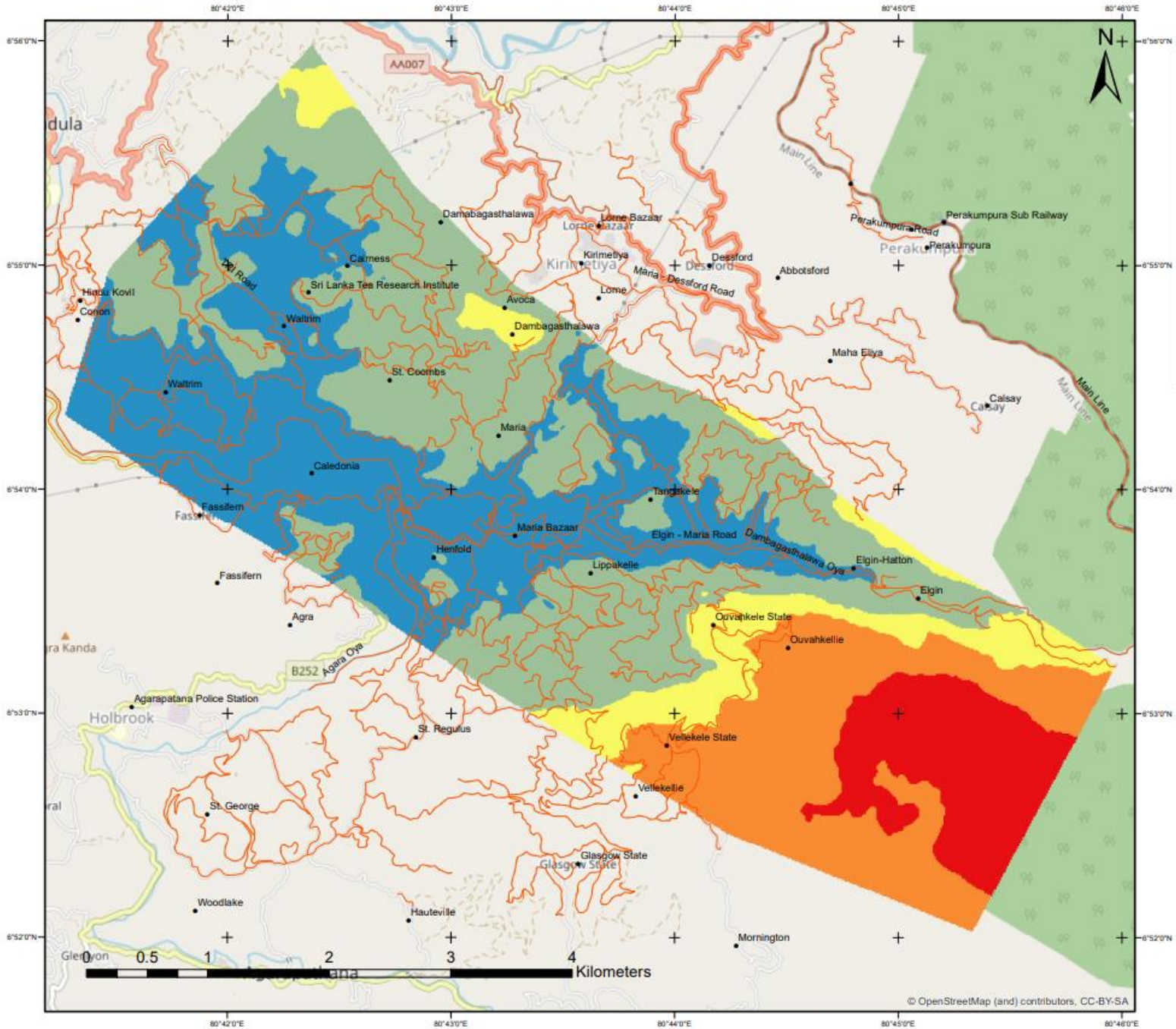
Normalized Difference Red Edge(Leaf and Soil Effects)



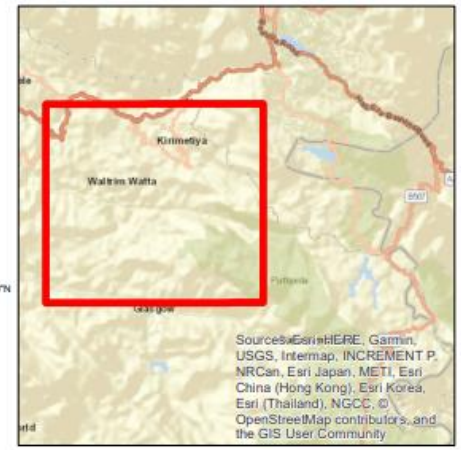
Automatic Weather Station Installed at Thalawakele TRI

Results of the first pilot study


Land Cover Classification 2020 - Thalawakele
N
Nuwara Eliya
AA007
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,
Legend
Open Forest/ Tree Canopy
Tea
Water
Builtup Area/Rocks
Dense Forest
Agriculture
Scrubland/Bushland
Bare Soil
Cartographic Information
Map scale: 1:30000
Projection: WGS_1984_UTM_Zone_44N
Data Sources: WorldView-2
Image date: 2020-01-26
Interpretation
This map is high resolution land use/and cover map for Thalawakele. It represent 8 classes with the dominant land covers/uses as derived from WorldView-2 data from 2020 with 0.5m, 2m spatial resolutions.
Extent(Sq.km)
Open forest/Tree Canopy 4.05 Tea 11.98
Builtup/Rocks 1.16 Agriculture 0.39
Scrub/Bushland 4.69 Bare Soil 2.24
Water 0.18 Dense Forest 4.33
Produced by: ACCIMT
Rathnagiriya
AA007
Damabagasthalawa
Lorne Bazaar
Kirimetiya
Dessford
Abbotsford
Perakumpura Sub Railway
Perakumpura
Main Line
Maria - Dessford Road
Cairness
Sri Lanka Tea Research Institute
Hindu Kovil
Conon
Waltrim
Avoca
Lorne
Dambagasthalawa
Maha Eliya
Calsay
St. Coombs
Maria
Caledonia
Tangakele
Fassifern
Maria Bazaar
Elgin - Maria Road
Dambagasthalawa Oya
Elgin-Hatton
Henfold
Lippakelle
Elgin
Quvahkele State
Quvahkelle
Agra
Agara Oya
B252
Agarapatana Police Station
Holbrook
St. Regulus
Vellekele State
Vellekellie
St. George
Glasgow State
Woodlake
Hauteville
Mornington
Agarapathana
0 0.375 0.75 1.5 2.25 3 Kilometers
© OpenStreetMap (and) contributors, CC-BY-SA



Digital Elevation Model - Thalawakele



Legend

ELEVATION [m]

- 1,177 - 1,300
- 1,301 - 1,400
- 1,401 - 1,500
- 1,501 - 1,700
- 1,701 - 1,900

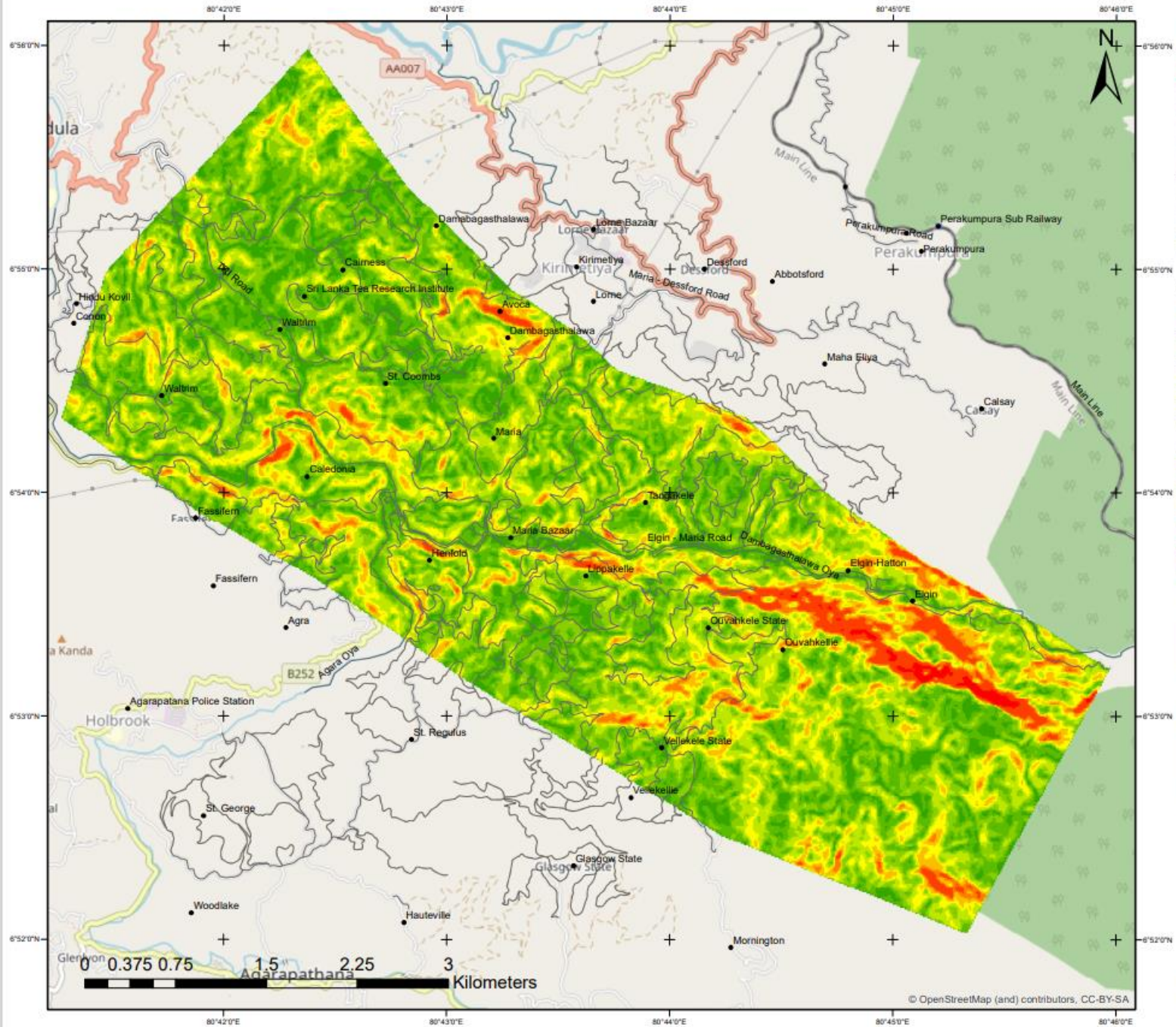
Cartographic Information

Map scale: 1:30000
Projection: WGS_1984_UTM_Zone_44N
Data Sources: ASF
Image date: 2006-2011

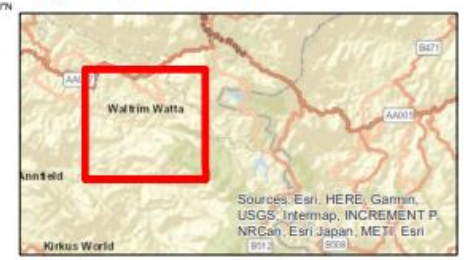
Interpretation

This map represents the “elevation” in meters above the WGS84 ellipsoid.

Produced by: ACCIMT



Slope Map - Thalawakele



Legend

SLOPE [DEGREES]

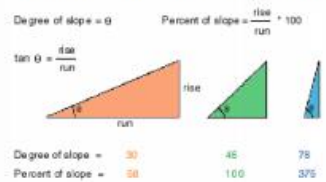
- 0 - 5
- 5 - 10
- 11 - 15
- 16 - 20
- 21 - 25
- 26 - 30
- 31 - 35
- 36 - 50
- 51 - 75

Cartographic Information

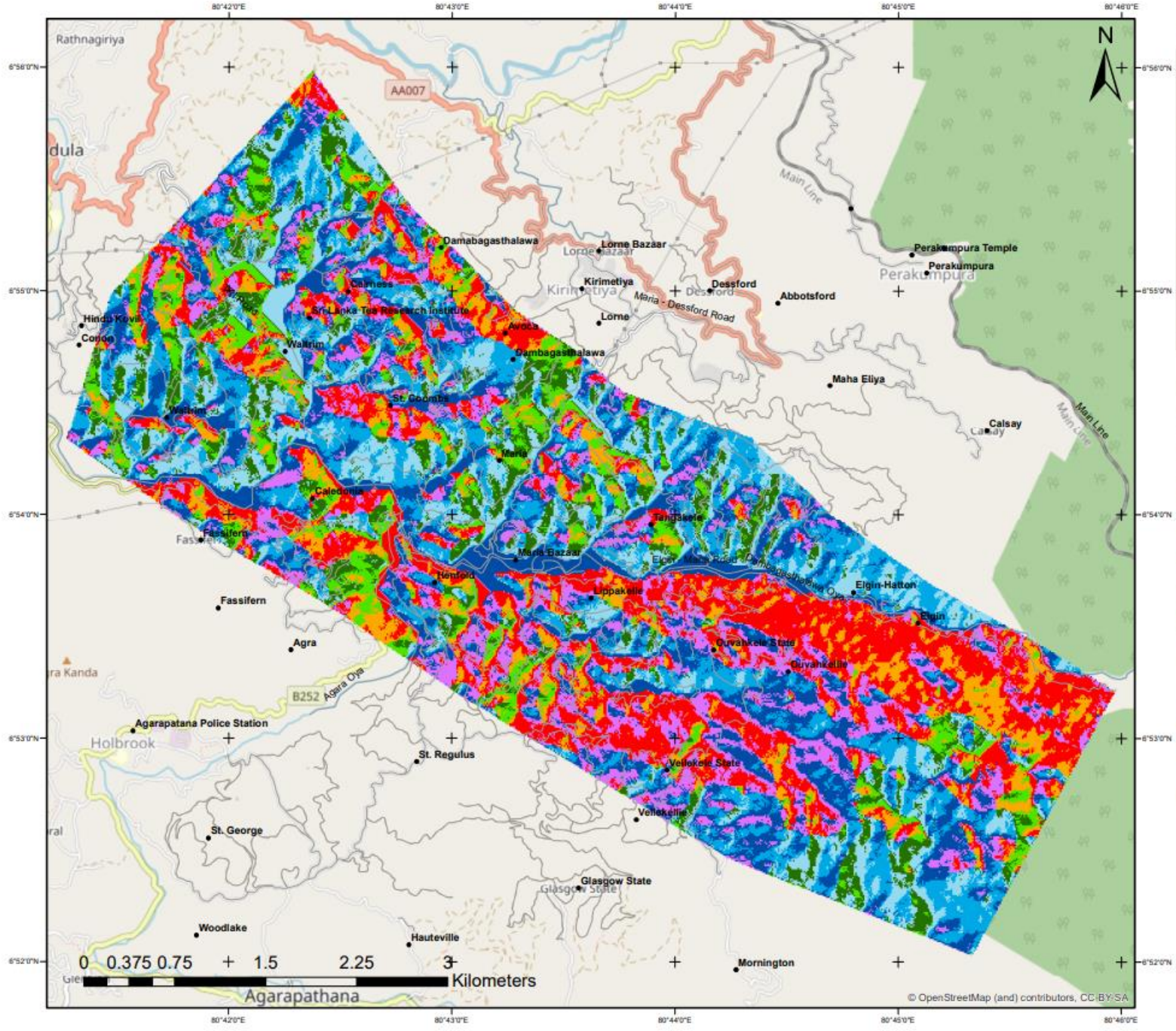
Map scale: 1:30000
Projection: WGS_1984_UTM_Zone_44N
Data Sources: ASF
Image date: 2006-2011

Interpretation

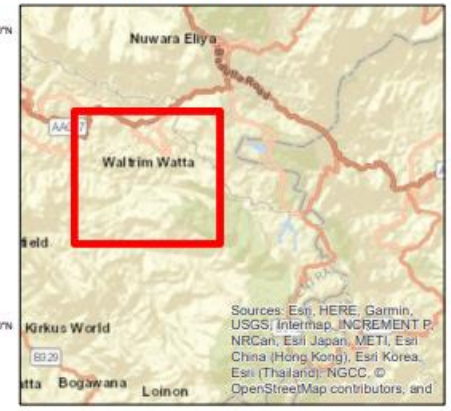
Slope identifies the steepest downhill slope for a location on a surface. For rasters, it is the maximum rate of change in elevation o-ver each cell and its eight neighbors.



Produced by: ACCIMT



Flow Direction Map - Thalawakele



Legend

DIRECTION

- 1
- 2
- 4
- 8
- 16
- 32
- 64
- 128

32	64	128
16		1
8	4	2

Direction coding

Cartographic Information

Map scale: 1:30000
Projection: WGS_1984_UTM_Zone_44N
Data Sources: ASF
Image date: 2006-2011

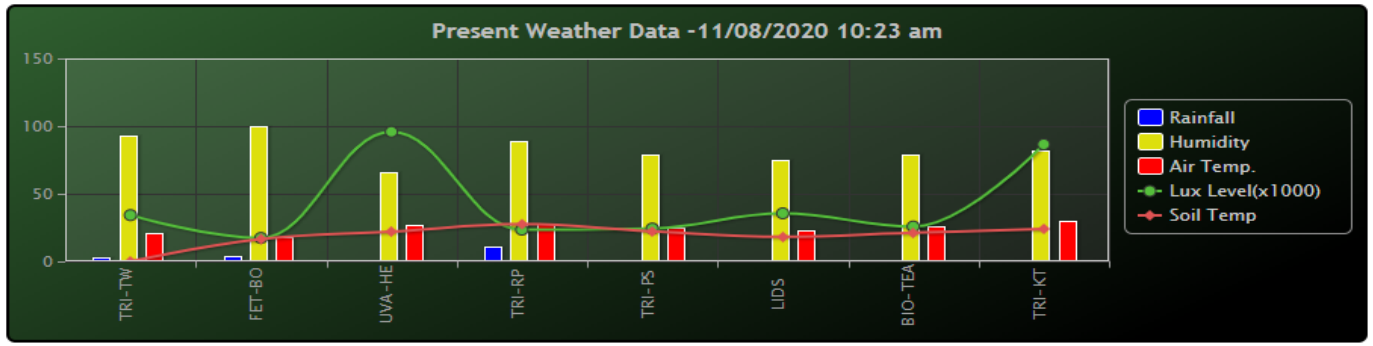
Interpretation

Flow direction determines which direction water will flow in a given cell. Based on the direction of the steepest descent in each cell, we measure flow direction.

Produced by: ACCIMT

IoT based Weather Information System for Gathering Instantaneous Weather Data from All Stations

Home | AWS Data | Report | Info | Misc | Logout (admin)



Please Note: Rainfall is cumulated from midnight

Center	Date Recorded	Time Recorded	Air Temp (°C)	Humidity (%)	Wind Direction (0°-359°)	Wind Speed (km/h)	Gust Speed (km/h)	Rainfall (mm)	UV Level (µw/sq.cm)	Light Level (Lux)	Soil Moisture_A (%)	Soil Temp.A (°C)	Soil Moisture_B (%)	Soil Temp.B (°C)	Ammonia Level (%)
TRI-PS	2020-08-11	10:23:44	24.60	78	23	8.1	12.1	0.0	801	24,280	99.9	23.6	99.9	22.2	16
TRI-KT	2020-08-11	10:22:45	29.40	81	97	2.5	4.0	0.6	2,159	86,530	99.9	23.9	75.1	23.9	99
LIDS	2020-08-11	10:22:07	22.20	74	286	0.0	0.0	0.0	939	35,515	99.9	18.5	99.9	18.2	52
TRI-TW	2020-08-11	10:19:53	20.40	92	313	1.5	4.0	2.7	1,146	34,185	99.9	20.2	0.0	0.0	76
FET-BO	2020-08-11	10:19:44	17.90	99	323	6.1	12.1	3.3	469	17,341	99.9	18.0	99.9	16.5	63
UVA-HE	2020-08-11	10:19:27	26.10	65	120	1.0	4.0	0.0	2,969	95,794	99.9	20.8	99.9	21.9	31
TRI-PS	2020-08-11	10:18:44	25.30	76	264	0.0	0.0	0.0	800	24,196	99.9	23.6	99.9	22.2	17
TRI-KT	2020-08-11	10:17:45	29.40	82	98	3.0	4.0	0.6	1,000	43,415	99.9	23.9	75.1	23.9	100
LIDS	2020-08-11	10:17:08	23.10	72	258	0.0	0.0	0.0	741	33,161	99.9	18.5	99.9	18.2	52
TRI-TW	2020-08-11	10:15:10	20.20	92	285	1.5	4.0	2.7	1,818	53,513	99.9	20.0	0.0	0.0	76

Go to page: < Previous 1 2 3 4 5 6 7 8 9 10 Next >

Drones developed in-house at ACCIMT were used for data-gathering…



ACCIMT UAV – Short Endurance Tail sitter Mapping UAV





ACCIMT UAV – Medium Altitude Medium Endurance VTOL



ACCIMT UAV – Surveillance Quadcopter UAV





ACCIMT UAV – Vegetation and Land mapping



GeoGoviya

Led by

International Water Management Institute

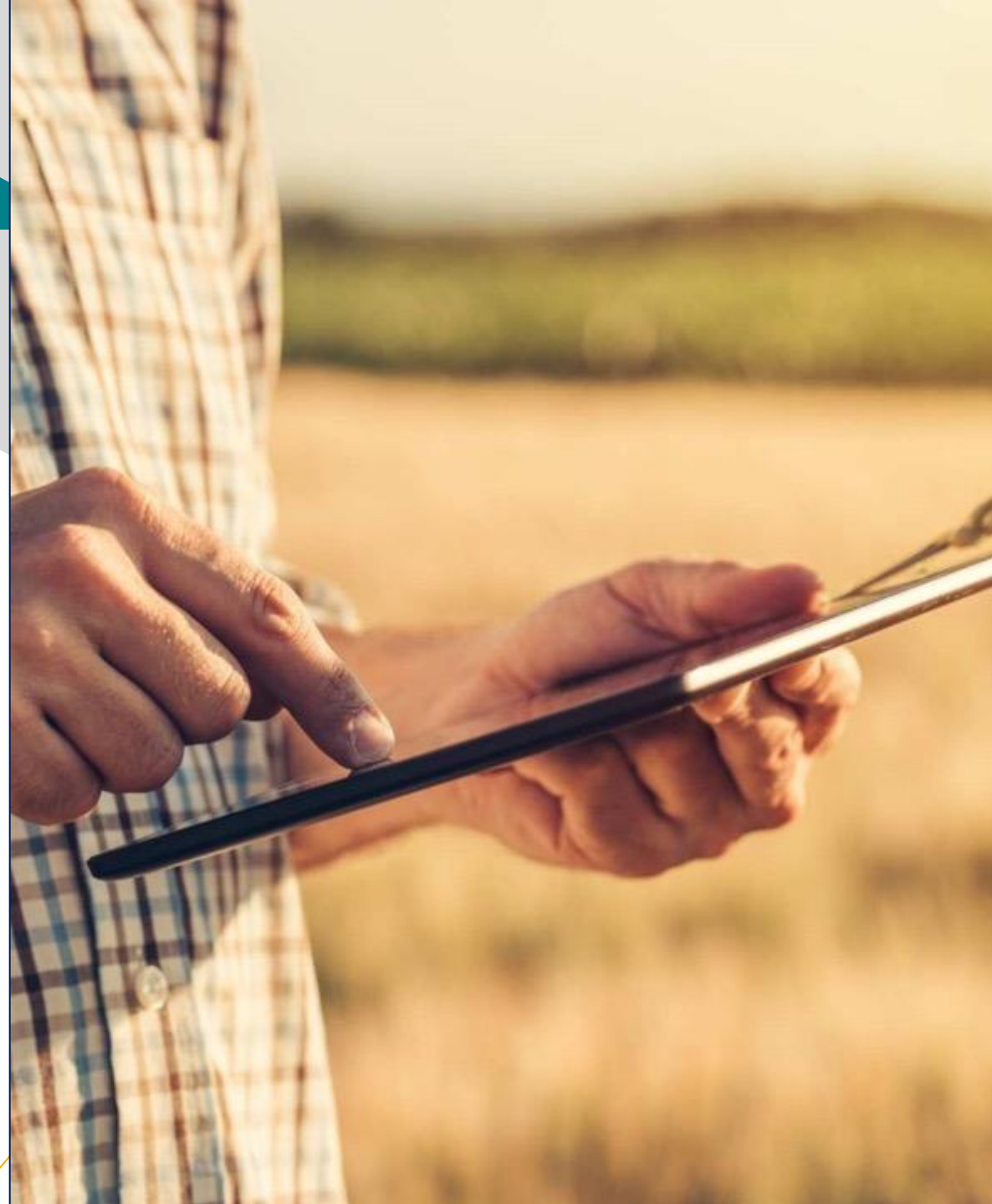
Technology provider

UNMITI

Supported by CGIAR WLE

Solution Overview

- GeoGoviya - Android mobile application to collect ground data with real-time web application to monitor ground data.
- Capturing and monitoring beneficiary, farm surveys, and govt schemes data
- Monitors crop performance with key indicator metrics
- Advance analysis of district performances
- Employee/staff monitoring
- Analytics and visualization of data



Features

Farmer Registration

- Unique Identification by QR code
- Bulk Data upload

Farm Registration

Geotagging farm

User Management

- Role Mapping
- Location mapping

Dashboards

- KML Dashboard
- Real Time dashboard
- Key Indicators Tracking
- Data export

Activities

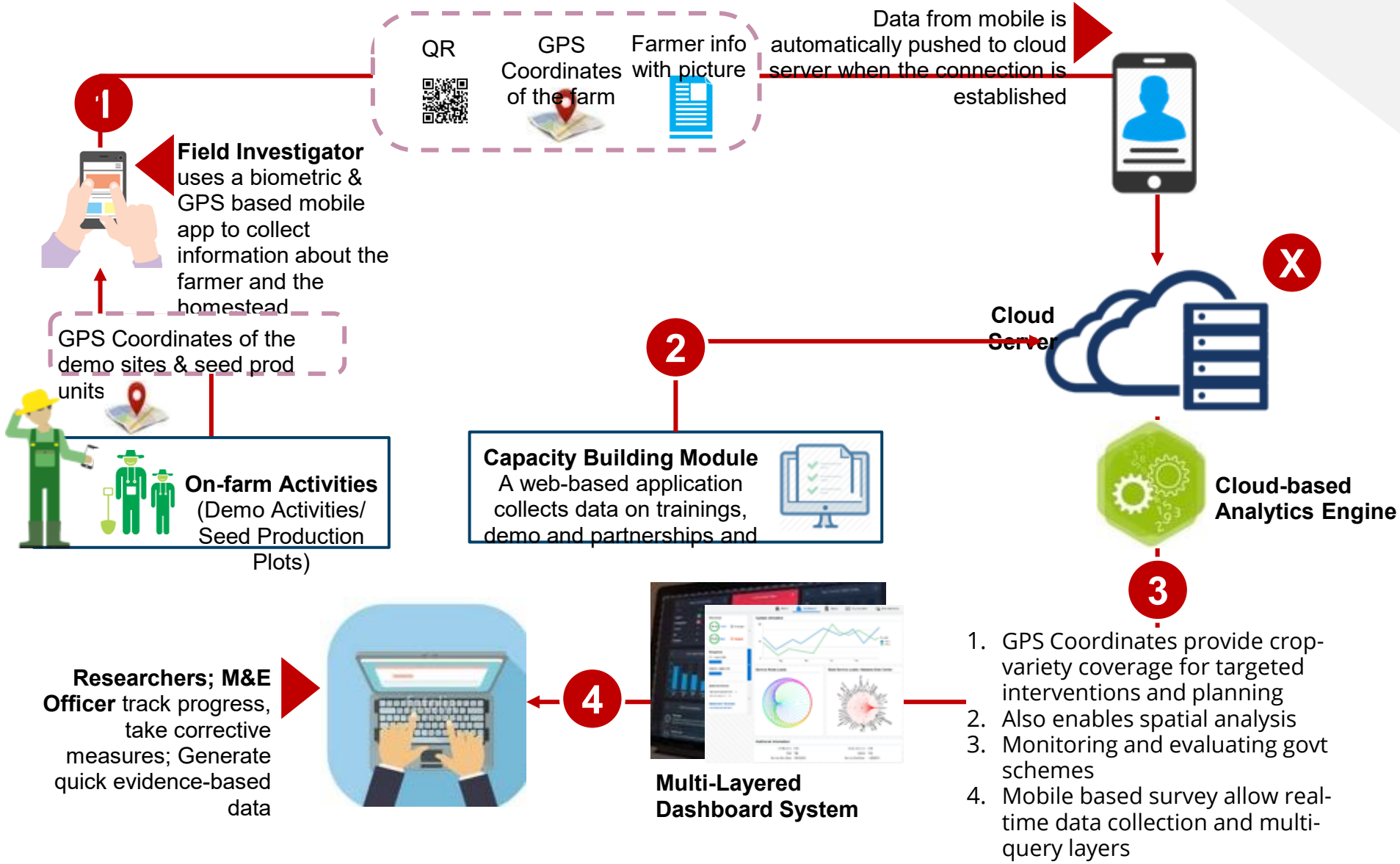
- Verification
- Land measurement
- Survey updates
- Approval System

Meta Data Upload

- Location Hierarchy
- Government Schemes

Multi-language support (English, Sinhala, Tamil)

Solution Architecture



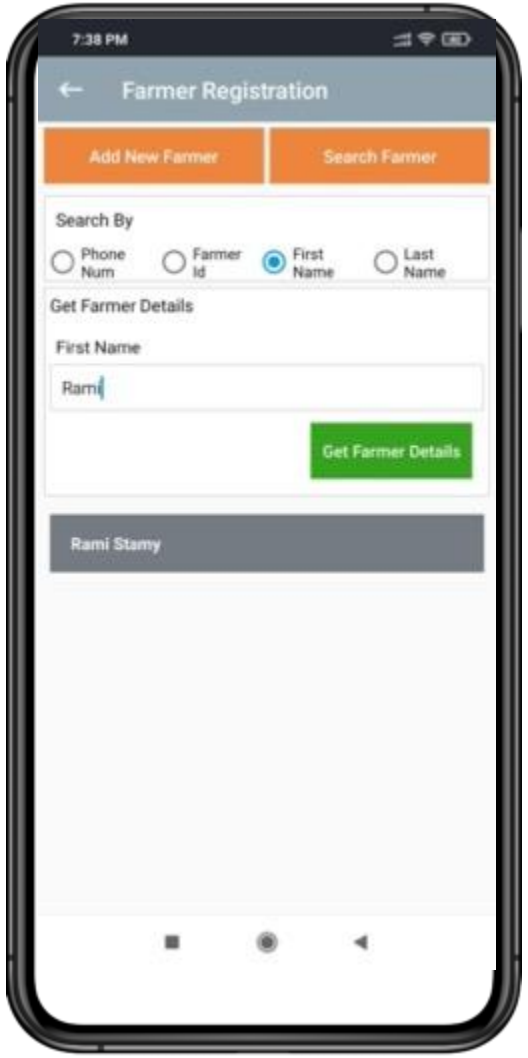
Farmer Registration

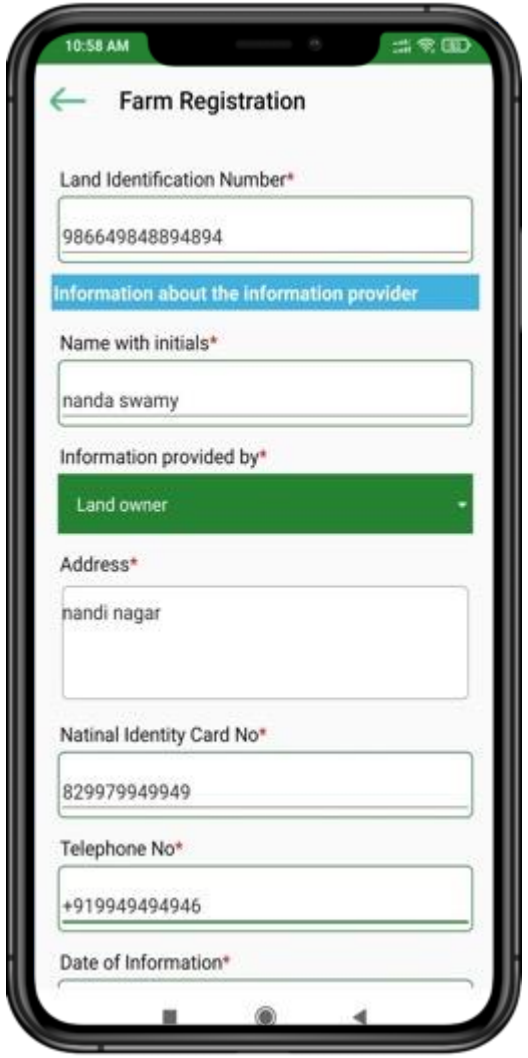


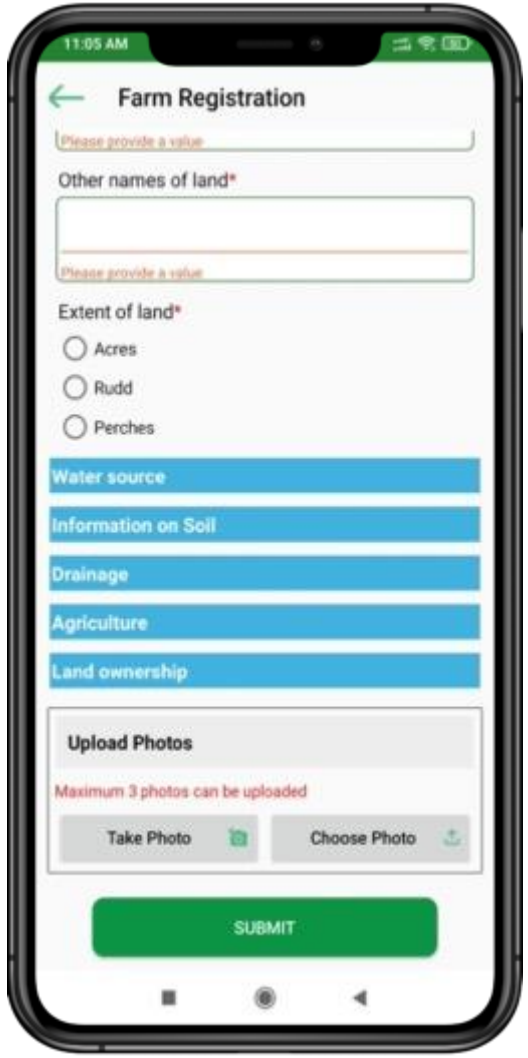


- GeoGoviya enables field staff or enumerators to collect the beneficiary/farmer data, in real-time.
- Farmer identification with QR cards.
- An unique id matching nation id will be generated and stored.
- Unique national id will be either scanned or entered to update farmer records
- Geo location of the farmer will captured from where the actual data is captured.

Farm Registration



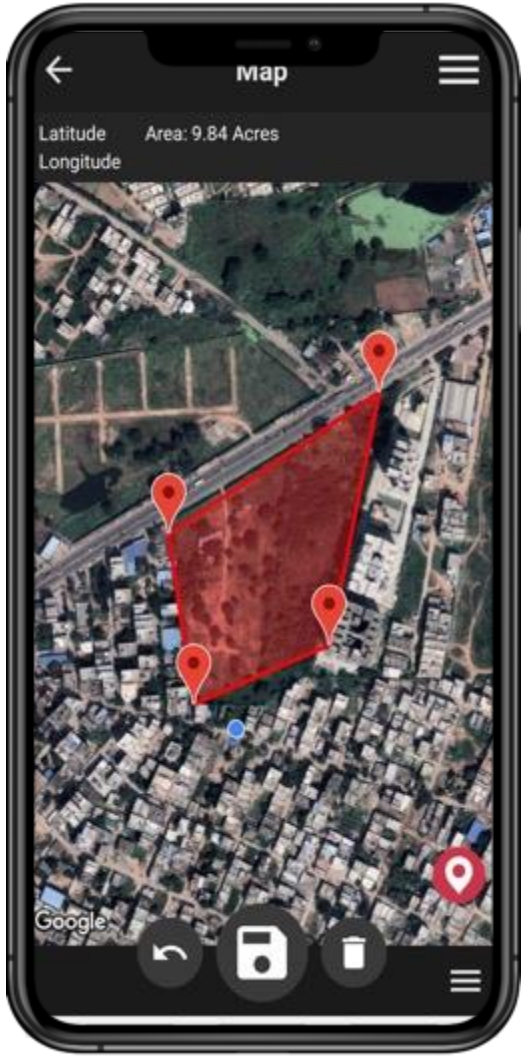


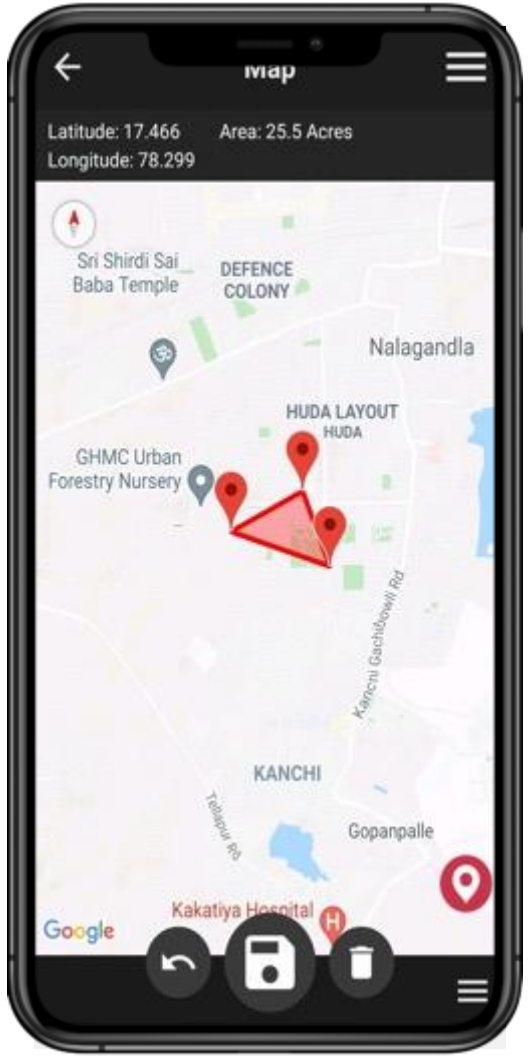


- Enumerator can register farm against the farmer
- Enumerators searches for the Farmer national id or scans QR card.
- Multiple farms can be registered against single farmer
- Farm Location will be captured with Geo-coordinates
- Geo tagging of the farm can be done using KML mapping

Farm Registration - KML plotting

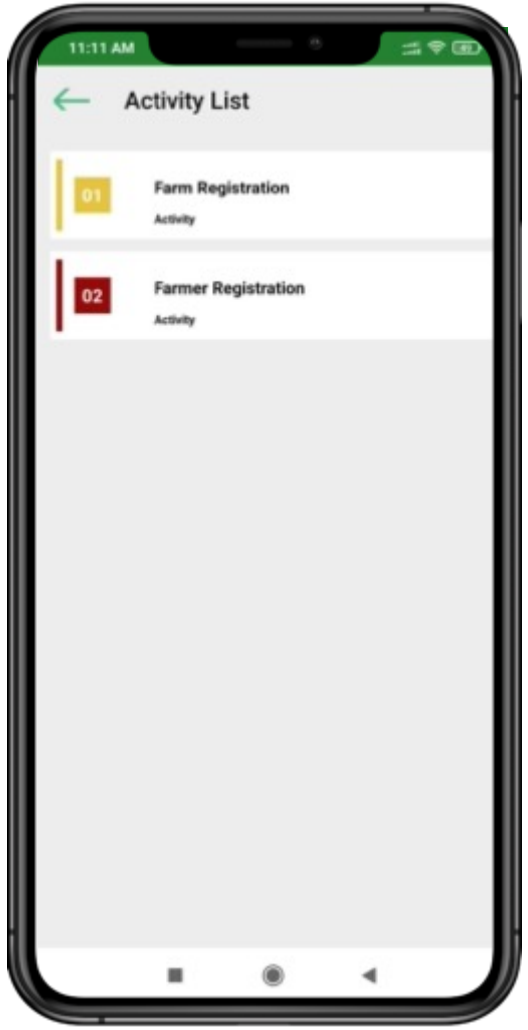






- Enumerator searches for the farmer and Plot for which KML has be drawn. Upon finding farm enumerators can start plotting the farm KML
- KML Plotting can be done manually, Walk through or GPS.
- KML plotting can be done in Satellite or Terrain view.

Activities & Schemes



- Verification
- Land measurement
- Farm Survey updates:
  - Crop
  - Soil
  - Irrigation
  - Drainage
  - Land ownership
  - Occupation
  - KML mapping

- Farmer data updates

Opportunities and Challenges, and Policy Interventions Needed

- Majority of Applications at the Pilot Level or Early Operational level (as opposed to mature operational level) across many user-agencies
  - Capacity for effective use long established in qualitative terms
  - Much of the problem remains quantitative- the need of ‘Critical Mass’
- Easy-to-Bridge Technology and Human Resource Capacity Gaps across many potential user-agencies
- Financial Commitments at Organizational Level – largely within affordable limits
- Major Policy Intervention needed at the national level
  - The policy process is just beginning, through multiple initiatives

If the problem is indicative of a shared issue across many similarly circumstanced nations in the region, a UNESCAP initiative to inform the National Policy Processes would be well justified

Potential Contributions to Secretariat:

- Contribution to a team of Resource Persons in Developing a Capacity Building Programme for Supporting the National Governments in the region that are in need of support in developing National Space Policy/Legislation

Thank you!