



SuZeeYar – Myanmar Spatial Data Platform Conference
16-18 May,2016, Nay Pyi Taw

***Geospatial Data Applications on
Academic Platform of Mandalay
Technological University***

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Outlines

- **Background of Remote Sensing Department**
- **Human Resources Development Sector**
- **Research & Development Sector**
- **Current activities**
- **List of local Stakeholders Partners**
- **Linkage with International Organizations**
- **Challenges**
- **Future Steps**
- **Conclusion**

Background of Remote Sensing Department

- ✦ The First Myanmar-India Friendship Centre For Remote Sensing and Data Processing (MIFRSDPC) has been established in Yangon on 15th February 2001, with the Initiative of Ministry of Science and technology (MOST), Myanmar and Indian Space Research Organization (ISRO), India.
- ✦ Staff Members of the Centre have been trained on Applications of Remote Sensing Technology by ISRO since 2001.

Background of Remote Sensing Department

- ❖ Research oriented program for post graduate studies affiliated under the United Nations (CSSTEAP) has been carried out successfully since 2002-2003 in Indian Institute of Remote Sensing (IIRS), Dehradun, India.
- ❖ Myanmar-India Friendship Centre for Remote Sensing and Data Processing (MIFRSDPC) was moved to Mandalay Technological University (MTU) and renamed as Remote Sensing Department in 2007.
- ❖ At present, there are totally 13 staffs in RS dept.

Remote Sensing Department

Vision

- ❖ To undertake Remote Sensing, Geo-informatics and their applications in natural resources survey, Earth and atmospheric sciences, oceanography, infrastructure development, environmental and disaster management

Mission

- ❖ To disseminate through capacity building programme and research in the field of Remote Sensing and GIS applications
- ❖ To participate in various research programmes of national research activities and human resources development programme

Long-term goals

- ② Expanding RS & GIS Applications in different fields
- ② Exchanging experiences among local and international organizations
- ② Building the advanced technologies for land-use & disaster monitoring.

Human Resources Development Sector

- ❖ PG Diploma course on Remote Sensing and GIS
- ❖ Various Basic/Advanced short courses on Remote Sensing & GIS
- ❖ Teaching as supporting subject for Civil Engineering Students

GIS and Remote Sensing Courses (Post Graduate Level)

Name of Program	Course Title	Research Areas	Number of Internal Staff Involved	Number of External Staff Involved	Enrollment
Diploma Course on Remote Sensing and GIS	Photogrammetry, Remote Sensing & GIS	Urban Planning, Agriculture, Geoscience, Marine Science	6	-	13

GIS and Remote Sensing Short Courses (such as workshops / certificate courses etc)

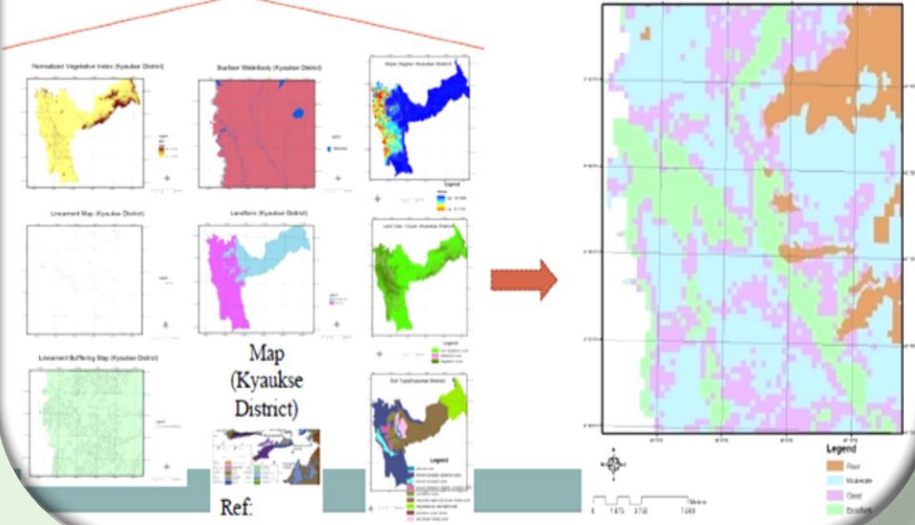
Course Name	Duration	Target Audience	Enrollment
Utilization of Space Technology for DRR	5 days	Government and Educational sectors	30
Introduction to GIS and Remote Sensing	10 days	DHSHD, MCDC (government officials)	35
Introduction to Quantum GIS	5 days	Ministry of Education, Ministry of Health, Ministry of Livestock and fishery, RRD (government officials)	40
Advanced GIS for Land use mapping	10 days	Students (MTU)	20
Advanced ArcGIS	10 days	Urban Development (government officials) (annual training)	30
Basic Remote Sensing	10 days	Students (University of Taunggyi)	20

GIS and Remote Sensing Courses (Undergraduate & Post Graduate Level)

Name of Program	Course Title	Research Areas	Number of Internal Staff Involved	Number of External Staff Involved	Enrollment
4 th Year COE (Civil)	Photogrammetry and Remote Sensing	-	3	-	35
Master and Ph.D (Water Resources Civil Engineering)	Basic Remote Sensing and GIS	Water Resources Engineering	3	-	26
	Advanced Remote Sensing and GIS				

Research & Development Sector

(Past Activities)

Topic	With whom	Outcomes																																	
<p>Estimation of Groundwater Potential Zone in Kyaukse Township, Mandalay Division</p> <p>(finished in 2009)</p>	<p>Engineering Geology Department, YTU</p>	<p>Groundwater Potentials Using Remote Sensing and GIS</p> <table border="1" data-bbox="1000 568 1452 845"> <thead> <tr> <th>Theme</th> <th>Category</th> <th>Basic for categorization</th> </tr> </thead> <tbody> <tr> <td>R1</td> <td>Lineament density</td> <td>Lineament density analysis value</td> </tr> <tr> <td>R2</td> <td>Lithology</td> <td>Rock types, porosity and texture</td> </tr> <tr> <td>R3</td> <td>Soil</td> <td>Permeability, texture and porosity etc.</td> </tr> <tr> <td>R4</td> <td>Lineament buffering</td> <td>200m buffer along lineaments, 500m X-points</td> </tr> <tr> <td>R5</td> <td>Landform</td> <td>Morphological type, areal extent, relief etc.</td> </tr> <tr> <td>R6</td> <td>Landuse</td> <td>Status and condition</td> </tr> <tr> <td>R7</td> <td>Slope</td> <td>Slope degree</td> </tr> <tr> <td>R8</td> <td>Drainage density</td> <td>Drainage density value</td> </tr> <tr> <td>R9</td> <td>Vegetation index</td> <td>NDVI value</td> </tr> <tr> <td>R10</td> <td>Surface waterbody</td> <td>River, Lakes and ponds</td> </tr> </tbody> </table> 	Theme	Category	Basic for categorization	R1	Lineament density	Lineament density analysis value	R2	Lithology	Rock types, porosity and texture	R3	Soil	Permeability, texture and porosity etc.	R4	Lineament buffering	200m buffer along lineaments, 500m X-points	R5	Landform	Morphological type, areal extent, relief etc.	R6	Landuse	Status and condition	R7	Slope	Slope degree	R8	Drainage density	Drainage density value	R9	Vegetation index	NDVI value	R10	Surface waterbody	River, Lakes and ponds
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Research & Development Sector

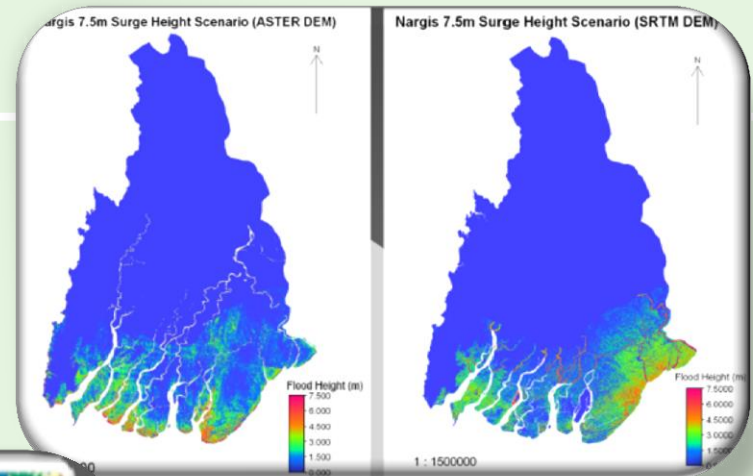
Topic

With whom

Outcomes

Utilization of Space based Technologies on Disaster Risk Management

AIT,
JICA &
ADRC



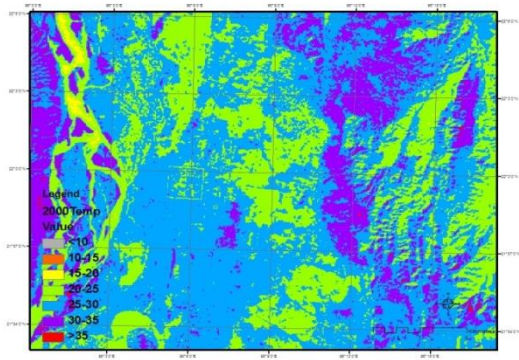
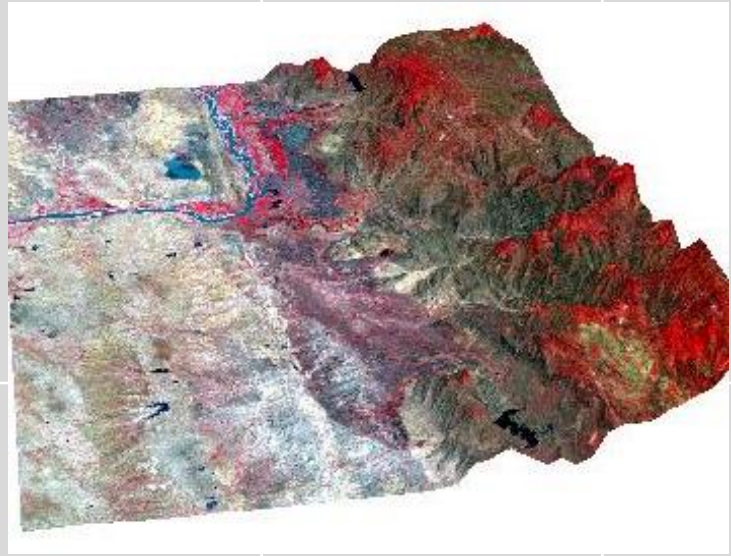
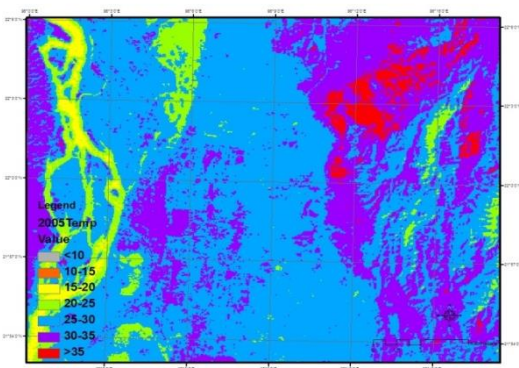
(Basic RS, GIS & GPS

were translated to Myanmar Language)

(finished in 2010)



Research & Development Sector

Topic	With whom	Outcomes
<p>Detecting Trend on Urban Warming Temperature in Mandalay City</p> <p>(finished in 2012)</p>	<p>Departmental Project</p>	
		 <p data-bbox="1197 1292 1680 1370">Land surface temperature map of Mandalay City (2000 & 2005)</p>

Research & Development Sector

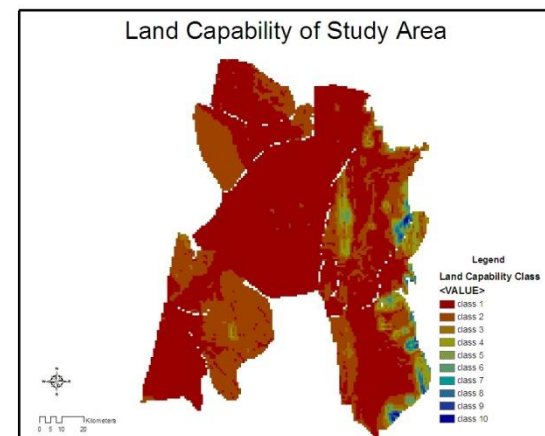
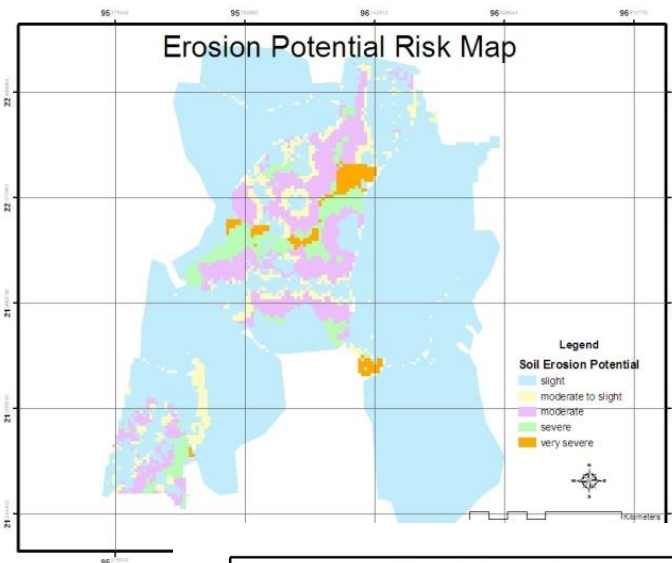
Topic

Spatial Pattern Analysis
of Land Degradation in
Mandalay Watershed,
Central Myanmar
(finished in 2013)

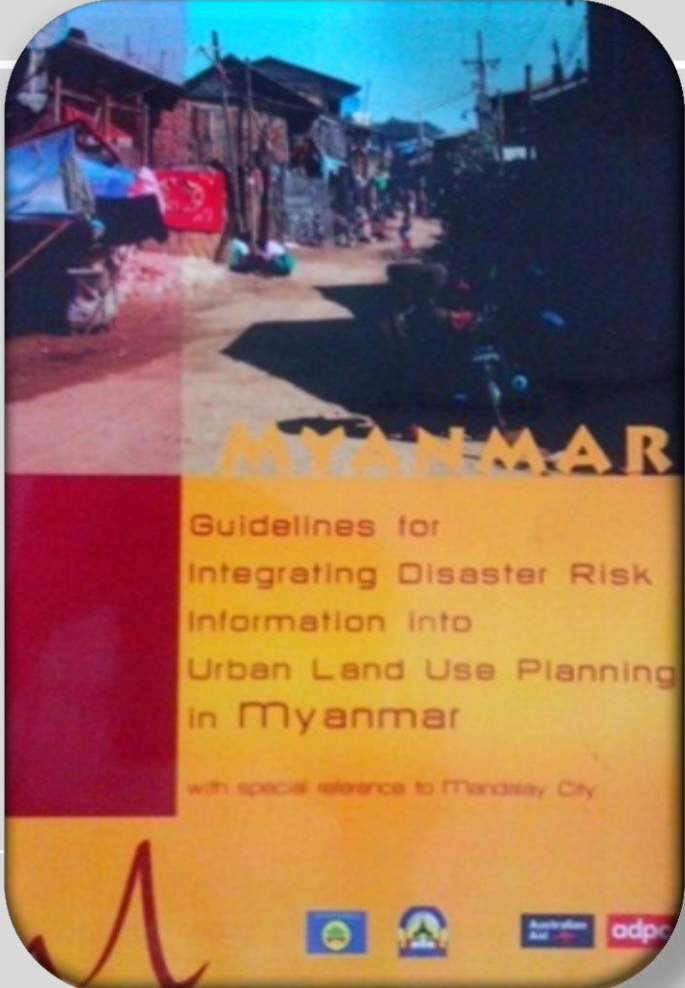
With whom

Departmental
Project

Outcomes



Research & Development Sector

Topic	With whom	Outcomes
Developing Guidelines for Integrated Disaster Risk Information into Urban Land Use Planning in Myanmar (finished in 2014)	ADPC, MCDC & DHSHD	 The image shows the cover of a report titled 'MYANMAR Guidelines for Integrating Disaster Risk Information into Urban Land Use Planning in Myanmar'. The cover features a photograph of a narrow street in a densely populated urban area with makeshift buildings and laundry hanging from lines. The title 'MYANMAR' is written in large, bold, yellow letters. Below it, the subtitle 'Guidelines for Integrating Disaster Risk Information into Urban Land Use Planning in Myanmar' is written in smaller yellow text. At the bottom, it says 'with special reference to Mandalay City'. There are logos for UNISDR, Myanmar, and ADPC at the bottom right.

Research & Development Sector

Topic

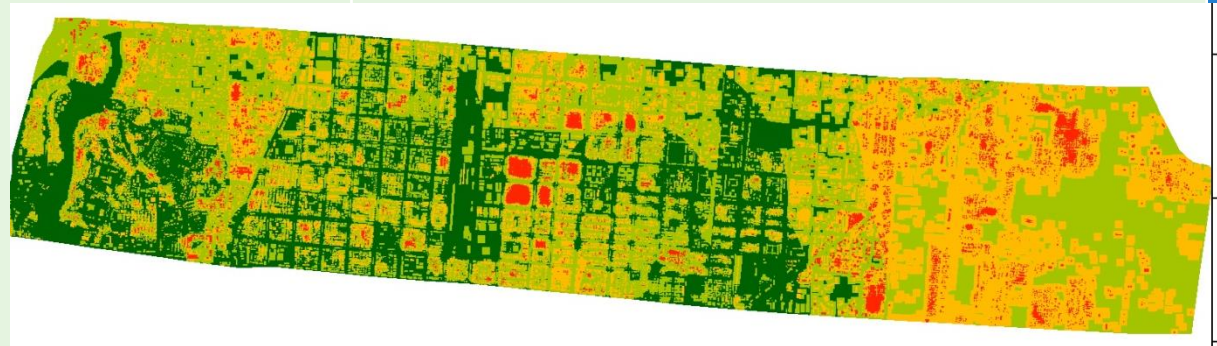
With whom

Outcomes


Urban Fire Analysis
(Chan Aye Tharzan
Township, Mandalay)

Departmental
Project

(finished in 2014)



Research & Development Sector

Topic	With whom	Outcomes
Nomination Dossier of World Heritage for Pyu Ancient Cities (finished in 2014)	UNESCO, Ministry of Culture and Religious Affairs, Survey Dept.	 <p>The image displays three archaeological maps of the Pyu Ancient Cities, each presented in a rounded rectangular frame. The top-left map is titled 'Pyu Ancient City - Si Khetra Archaeological Map' and shows a detailed site plan with various colored zones and structures. The top-right map is titled 'Pyu Ancient City - Balthara Archaeological Map' and shows a similar site plan with a prominent river system. The bottom-right map is titled 'Pyu Ancient City - Habin Archaeological Map' and shows a site plan with a grid overlay. Each map includes a scale bar and a legend.</p>
		New Topomap of Pyu City

Research & Development Sector

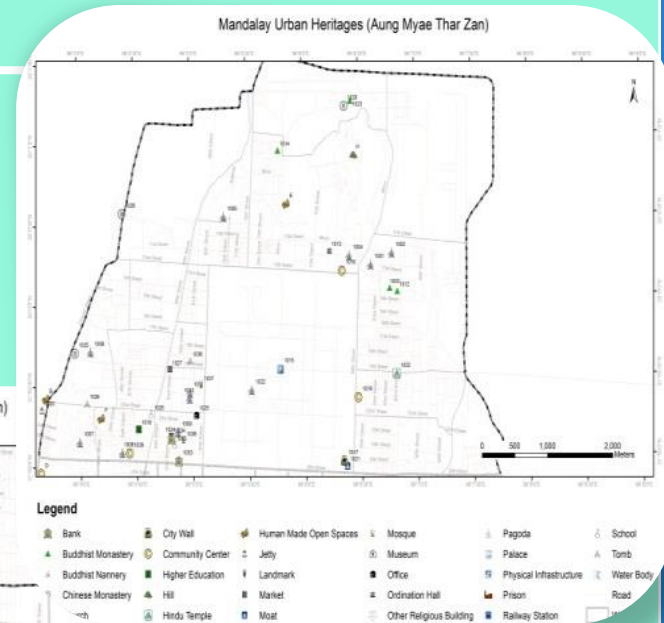
Topic

With whom

Outcomes

Heritage Building
Inventory Project
(Mandalay, Pyin Oo
Lwin & Bagan)
(finished in 2015)

DHSHD &
Dept. of
Architecture,
MTU



Research & Development Sector

Topic

With whom

Outcomes



Urban Service Improvement Project

(finished in 2015)

ADB & MCDC



Research & Development Sector

Topic	With whom	Outcomes
<p>Flood Hazard Mapping and Risk Assessment (case study – Kalay City, Sagaing Region) Finished in 2015</p>	<p>Myanmar Aerospace Engineering University (MAEU)</p>	 

Research Areas of Master Students Thesis

Topic	With whom
<ol style="list-style-type: none"><li data-bbox="40 278 1562 411">1. Developing Flood Risk Mapping for Ayeyarwaddy River Basin in Selected Delta Region<li data-bbox="40 446 1562 579">2. Investigation of Challenges and Problems in Paunglaung Dam Assessment<li data-bbox="40 615 1562 748">3. Study on the effects of bank protection and river training works in Ayeyarwaddy river reach (Mandalay area)<li data-bbox="40 783 1562 916">4. Flood Regionalization Using Rainfall and Basin Characteristics of Upper Ayeyarwaddy Basin.<li data-bbox="40 952 1562 1085">5. Prediction of Storm Surge and Risk Assessment of Rakhine Coastal Region<li data-bbox="40 1120 1562 1182">6. Flash Flood Risk Assessment, Daung Nay Stream, Magwe Divison	Civil
<ol style="list-style-type: none"><li data-bbox="40 1278 1562 1410">1. GIS- based Optimal Route Finding System for Emergency Case in Mandalay City	IT

Current Activities

- ❖ Departmental Projects
- ❖ National Projects
- ❖ International Cooperation Projects

Departmental Project

(U Nyi Hla Nge Foundation Project)

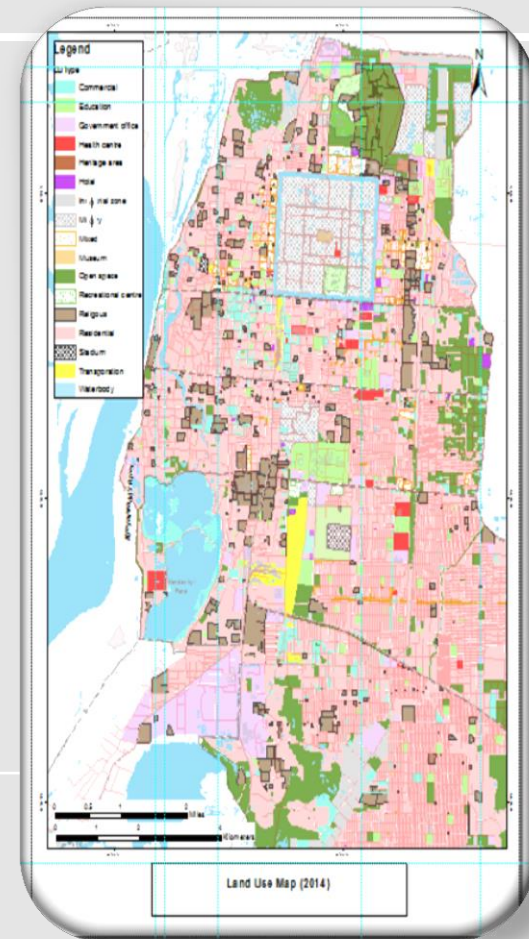
Topic

With whom

Outcomes

Land Use Change Detection
for Urban Planning in
Mandalay City
(2004 & 2014)
(Still going on)

-



National Project

Topic

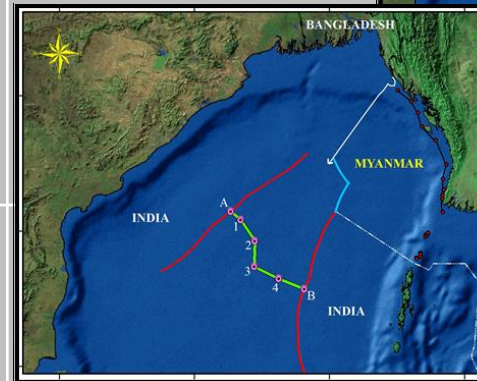
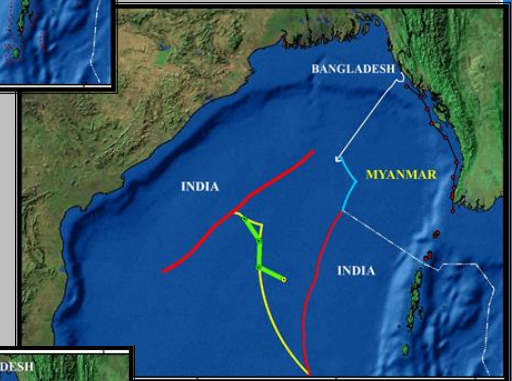
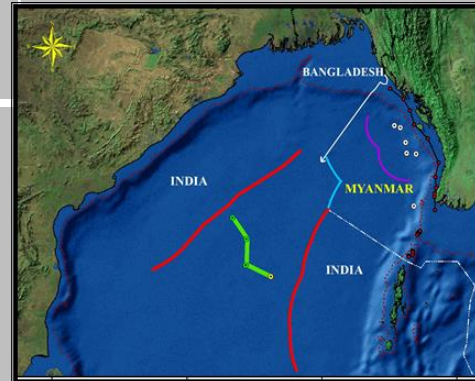
Delineation of Outer Limits of Continental Shelf beyond 200 Nautical Miles
(Still going on)

http://www.un.org/Depts/los/clcs_new/clcs_home.html

With whom

MOFA, MOE,
MOGE,
MOD (Navy)

Outcomes



National Project

Topic	With whom	Outcomes
World Heritage Nomination Dossier for Ancient Cities (Bagan)	UNESCO, Ministry of Culture and Religious Affairs	still going on

Ayeyarwaddy WLE fellowship program (2015-2016)

Topic

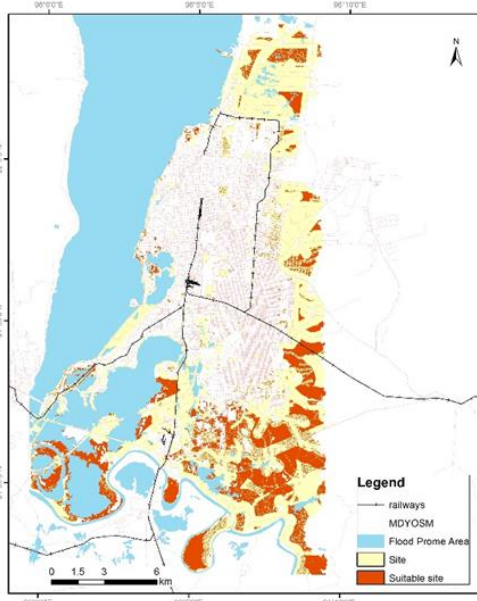
Integrating Water Resilience Strategy into City Planning of Mandalay
(Still going on)

With whom

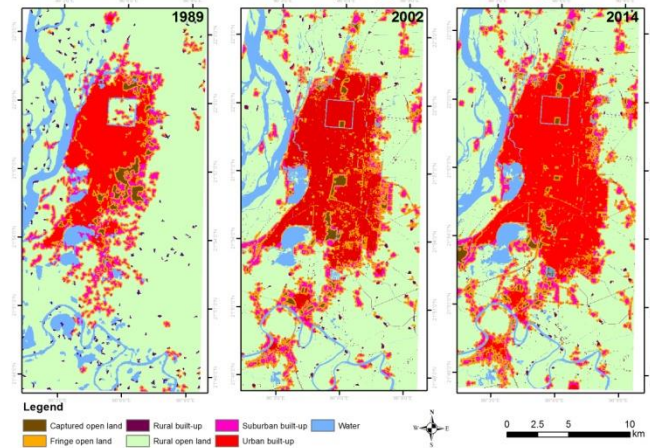
UNESCO-IHE, Institute for water Education in the Netherlands

Outcomes

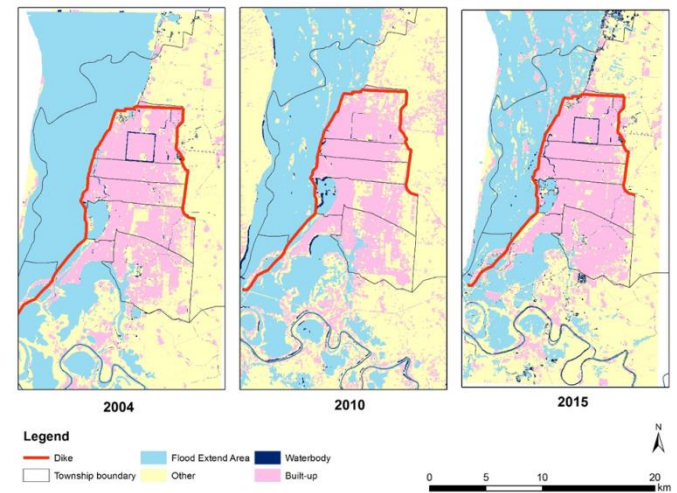
Suitability Analysis for Future New Development Site



Urban Footprint of Mandalay City (1989, 2002 & 2014)



Flood Inundated Area Map



List of Local Stakeholders Partners

- ◆ The Department of Meteorology & Hydrology, Ministry of Transportation and Communications
- ◆ Directorate of Water Resources and Improvement of River Systems
- ◆ Myanmar Information Management Unit (MIMU)
- ◆ Ministry of Natural Resources & Environmental Conservation
- ◆ Ministry of Social Welfare, Relief and Resettlement
- ◆ Mandalay City Development Committee (MCDC)
- ◆ Yangon City Development Committee (YCDC)
- ◆ Department of Human Settlement and Housing Development(DHSHD), Ministry of Construction
- ◆ Ministry of Culture and Religious Affairs
- ◆ Survey Department

Linkage with International Organizations

- ▶ Tokyo University, Japan
- ▶ China Centre for Resources Satellite Data & Application (CRESDA)
- ▶ GISAT Company, European Space Agency, The Czech Republic
- ▶ University of Maryland, USA
- ▶ Asian Disaster Preparedness Centre (ADPC) , Thailand
- ▶ UN-SPIDER
- ▶ SERVIR MEKONG Project(Five Universities Network (Cambodia, Lao PDR, Myanmar, Thailand, Vietnam) with NASA, USAID,ADPC
- ▶ EU Mobility Project (ITC, The Netherlands)
- ▶ Earth Observation on Maritime Silk Road (EMSR), China
- ▶ Ayeyarwaddy WLE Project (UNESCO-IHE, The Netherlands)

Tokyo University, Japan

Course Name	Duration	Target Audience	Enrollment
Basic Course of Geo-spatial Technologies with on job training (Feb 2010, JSPRS, Tokyo University)	1 day Technical Training Program	MTU	30
Workshop on Advanced Geo-spatial Technologies & Applications (Nov 2010, Tokyo University)	1 day Technical Training Program	MTU	20

China-Myanmar Co - Laboratory of Remote Sensing Application (CM-CORSA)

Topic	With whom	Outcomes
<p>China- Myanmar Remote Sensing Data Sharing Platform Project (started at March, 2014)</p>	<p>Ministry of Science and Technology, China, China Centre for Resources Satellite Data and Application (CRESDA)</p>	 <p>The 'Outcomes' section contains three photographs. The top-left photo shows several people in a computer lab setting, with one man pointing at a monitor while others look on. The top-right photo shows a group of people, some in white shirts, gathered around a computer workstation, appearing to be in a collaborative discussion. The bottom photo is a group portrait of approximately 15 people, including men and women, some in white shirts and others in casual attire, standing and sitting in the same computer lab environment.</p>

GISAT Company, European Space Agency, the Czech Republic

Course Name	Duration	Target Audience	Enrollment
Capacity building in applications of Earth Observation data (in 24-25, September,2015)	2 days Technical Training Program	MTU, ADB, MCDC, Meteorology & Hydrology Dept, Agriculture & Land Statistic Dept	35

SERVIR MEKONG Project

Topic	With whom	Outcomes
<p>SERVIR Mekong project</p> <p>(started at the end of July, 2015)</p>	<p>NASA, USAID, ADPC & Five Universities (Cambodia, Lao PDR, Myanmar, Thailand, Vietnam)</p>	<ol style="list-style-type: none">1. Various training & workshop opportunities2. Joint Projects3. Experts & students exchange Program4. Scholarship Program

The Joint Capacity Building Training with KMUTT, Thailand

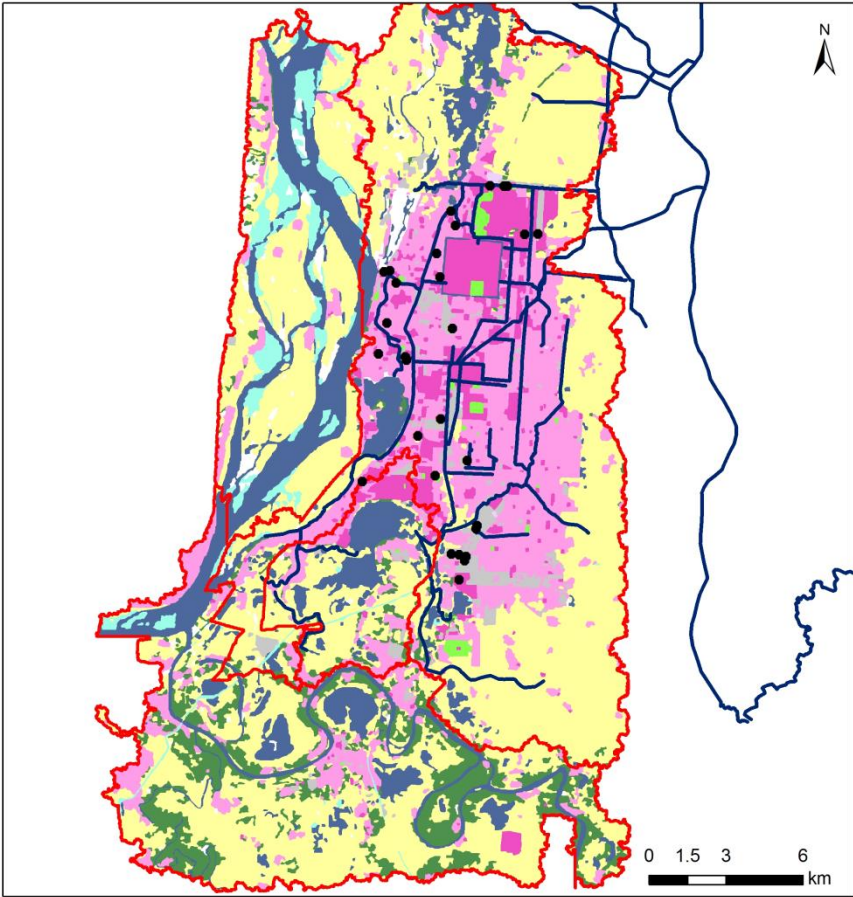
Course Name	Duration	Target Audience	Enrollment
Eddy flux tower measurements and satellite and climate data analysis using R programming (in 23-26, May, 2016)	4 days Technical Training Program	<ol style="list-style-type: none">1. Meteorology & Hydrology Dept,2. Agriculture & Land Statistic Dept3. Environmental Conservation Department (ECD)4. University of Mandalay (Geography Department)5. MCDC,6. MTU	35

ITC, The Netherlands

Topic	With whom	Main Objectives
<p data-bbox="73 486 620 751">Watershed Management for Disaster Prevention (WMDP)</p> <p data-bbox="59 829 653 939">(started at the beginning of 2016)</p>	<p data-bbox="745 479 1112 636">Main Partner Twente University, ITC</p> <p data-bbox="807 658 1051 879">EU Partner Osnabruck University, Germany</p> <p data-bbox="726 893 1132 1222">ASEAN Partner Naresuan University (NU), Thailand, University of The Philippines (UP)</p>	<p data-bbox="1166 479 1870 972">To develop the appropriate coordinating framework and guidelines of Extreme Rain and Watershed Management for Disaster Prevention (ERWMDP) at the community level, which is directly relevant to the national master plan of climate change</p>

Watershed Management for Disaster Prevention (WMDP)

Land Cover Map (2014): Mandalay Watershed



Legend

- IndustrialSite
- MR_main_drain_V1
- watershedMerge
- Agriculture
- Bare land
- Clouds
- Commercial and industrial units
- Construction sites
- Formal residential urban fabric
- Non-residential urban fabric
- Wetlands
- Trees
- Urban greenery
- Water bodies

Challenges

- Needs to give advanced trainings of RS&GIS to local staffs (Technical capacity)
- Needs more interconnectivity between ministries and agencies (partnership activities are still necessary)
- weakness in public awareness and local knowledge
- Needs Information & experience exchange improvement
- Needs to implement the action result
- Needs Funding

Future Steps

► WLE Proposed Projects (2016-2017)

- (i) “Operationalizing Water Sensitive Cities for Urban Climate Adaptation and Risk Reduction in Deltas of the South”
- (ii) “Promoting the Symbiosis of Cultural Heritage and Ecosystem services (PSYCHE)”

CONCLUSION

- ② to develop or upgrade our RS & GIS Application work done for disaster management , environmental conservation and natural resources management.
- ② stronger communication of information and coordination of action among not only local organizations but also other countries to think for future project, educational program as joint venture programs and explore other avenues for possible collaboration.
- ② Launching of meaningful Technical Cooperation for multidiscipline of space technology.



Thank you!!!!