GIS Working Group Meeting – 2nd November 2021

Chair: Javier Manrique (MIMU)
Participants: arche noVa, Burnet Institute, DRC, ICRC, Ipas, Pyin Nyar Tha Hla, Samaritan's Purse, UNICEF, UNHCR, UNOSAT and MIMU (19 participants from 11 organisations)
Virtual Meeting

1 GIS Working Group Terms of Reference (Review) – *MIMU*

Present GIS Working Group TOR – August 2014

- Background: The GIS Working Group (GIS WG) was formed in 2009 to address common geospatial issue – maps, boundaries, data exchange, standards – that affected the work of humanitarian and development actors in Myanmar.
- Objectives: The GIS WG is a technical group providing a platform for the coordination of GIS initiatives related to humanitarian and development activities. It will not seek to centralize data but would rather be a source of 'information on information', which can help directing interested parties to the agency where specific data are held. Its objectives are as follows: Develop and share best practices, Exchange information and experiences, Promote transparent information sharing, Promote capacity building, Collaborate in developing and disseminating common tools and approaches and Advocate for improved policies.
- Structure and Memberships: The GIS Working Group is a standing working group under the inter-agency Information Management Network and will report back to the IM Network on its activities and progress and representatives from all actors involved in GIS related activities, including NGOs, UN agencies, donors, *government departments* and universities/the academic sector. **NOTE: To be defined the partners of the group.**
- Expected Outputs: regular meetings and shared communications, Data cataloguing, identification of the main challenges of spatial data management, develop a minimum set of key geospatial parameters, definition of roles and responsibilities of major disaster, collaboration in data/information and capacity building exercises.

2 MIMU MAP MAKER Platform – *MIMU*

MIMU recently released a webmapping Map Maker based on ArcGIS Online. The platform is free to use by the general public. There are built-in base layers and users can add their own layers/information to create their own customized maps. Key characteristics to be mentioned are:

- It is important to read carefully and follow the disclaimer and MIMU Terms and Conditions of Use that pop up as soon as the platform page is opened.
- Base layers include the most requested information from MIMU and information that might be essential for humanitarian and development work such as population, health, education etc. The layers are dynamic, meaning they will be updated as the new data becomes available. By turning the layers on and off, users can add or remove them from the map. Depending on the layers chosen, legends with colours and symbols can be seen in the legend tab.
- Users can add their own data in shapefile, csv, kml, gpx, and geojson formats using an easy drag and drop interface accessible through the Add data tab. Any custom data and maps created by users are temporary for a session and will be deleted once the tab is closed or refreshed – they are not stored in the system or visible to MIMU or any other user in any way. This is to assure the security and privacy of the users and their information.
- The Base map gallery can be used to change the base map appearance with choices from openstreet map, topography, and satellite imagery etc.
- The Bookmark tab contains easy-to-access shortcuts to states and regions. If clicked, the map will automatically zoom in to the selected location. Custom bookmarks can also be added for any location of choice by the user.
- The Drawing tab features tools that allow the addition of text, lines, points and polygons with various customization options on sizes and colours.
- Using the measurement tab, areas, distances, and coordinates can be measured.

- In contrast, by using the handy coordinate conversion tool, the input coordinate can be converted to a point on the map as well as to convert that coordinate number to other systems such as UTM and MGRS.
- The resulting map can be printed in the print tab with advanced customization options on format, paper size, etc.

Question: The uploaded data will be seen only by the uploader or it will go public?
Answer: Only the uploader, temporary. It wont be saved in the platform; after close or refresh the browser, the information will be deleted

3 Myanmar by Night / Night-Time Satellite images – *MIMU*

Night-Time Satellite images are built from photographs of the earth taken from satellites over the course of the calendar year. Previously in 2014, MIMU complied Night-Time Satellite images of Myanmar and neighbouring countries over the period 1992 to 2012 into a video. With the availability of better satellite systems, an updated video has been made spanning a 28 years period from 1992 to 2020. https://themimu.info/nightlights
2021 version (1992 – 2020) 2014 version (1992 – 2012)

Night lights can also be used as an approximate indicator for socio-economic phenomena and many studies have taken advantage of extensive historical data for that. But it is important to keep in mind that night lights by themselves should not be the unique and authoritative sources but should play a supportive role in tandem with more concrete data using a proper methodology. An interesting scientific paper was mentioned - Noam Levin et. al. (2020). Remote sensing of night lights: A review and an outlook for the future. Unlike daytime satellite based remote sensing, night time provides more options using various forms of light sources even without the moonlight. More details on this can be seen in the presentation.

On the topic of sensors, the most well-known sensor is the International Space Station (ISS) itself. The images from the ISS are taken by astronauts using their DSLR cameras; however, the images are not scientific data, lack of georeferencing and lack of consistency. There are two satellite-based systems designed specifically for nighttime remote sensing and both are used for MIMU's nightlights videos: Defense Meteorological Satellite Program - Operational Linescan System (DMSP – OLS) of the Space and Missile Systems Center (SMC) - began in 1992 and continues to this day. Visible Infrared Imaging Radiometer Suite Day/Night Band (VIIRS – DNB) has been operational since 2012 through a joint partnership between NASA and NOAA.

MIMU's previous video showing nightlights from 1992-2012 used the DMSP-OLS images as the only ones openly available. That system is good as a source of historical data but suffers from low resolution. The newly released video of nightlights from 1992-2020 uses DMSP-OLS for years before 2012 and VIIRS after 2012 because of its vastly superior resolution. The night time satellite images can also be displayed with different color ramps and statistics adjustments, producing different views for a better interpretation and purposes. Differences in the resolution and clarity between the two systems can be seen in the presentation.

Some points came up during the discussion. One is whether detailed yearly analysis can be made. The monthly satellite images can be downloaded but yearly images are better compiled and thus have higher quality. It is then possible to create a detailed analysis of a year using monthly images of that year depending on the quality

	of said images. Note that some months will have problems due to cloud and precipitation. Another point is that the videos highlighted the disparity in access to electricity between urban and rural Myanmar, percentage of population connected to grid and growth rate compared to neighbours.
4	**Flood Mapping Production – *MIMU*** MIMU always produce flood mapping every monsoon season to support maps for required organisations and these organisations give humanitarian needs in disaster area. Process of flood mapping, Check the weather condition and daily water level via these links, • https://www.windy.com/ • https://www.gdacs.org/ • http://www.tropicalstormrisk.com/ • http://themimu.info/river-water-alerts • https://www.moezala.gov.mm/ Monitor Satellite image (radar-based flood mapping explains the use of Synthetic Aperture Radar (SAR - Sentinel-1) satellite imagery for flood mapping) for flood event date and download • https://scihub.copernicus.eu/ Processing Satellite image • SNAP software use for pre-processing and processing of SAR imagery using a threshold method for deriving the flood extent. • As pre-processing steps, calibrate and speckle filtering of data, geometric correction, terrain Correction, determine flooded areas and band Maths (to extract water extent) • As post-processing steps, view resulting flood areas, convert data to ArcGIS Format, data verification with Image and data cleaning Calculating Statistics Data • WorldPop estimates are based on the relationship between land cover and population data and also include geospatial data that may correlate with human population presence (e.g. roads networks, large water bodies, settlements, etc). • https://www.worldpop.org/ MIMU flood maps are uploaded on Emergencies page and easily download for Floods Emergency Response. • https://themimu.info/emergencies/floods-2021
5	**UNOSAT** UNOSAT is division of Satellite Analysis and applied research at the United Nations Institute for Training and Research (UNITAR) and operated since 2001, recognized as the United Nations Satellite Centre in June 2021. Operational Pillars – Training and Capacity Development, Satellite Analysis and Applied Research and Innovation

- Intro to UNOSAT Humanitarian Rapid Mapping Service: UNOSAT provide satellite image analysis during humanitarian emergencies for natural disasters and conflict situations. 24/7 operational service: team of experience analysts based in GVA and BKK ensure timely delivery of satellite imagery derived maps, reports and data according to needs of UN agencies and Humanitarian actors.
- UNOSAT Geospatial Catalogue and Services: based on different disaster, type and also according to different phases of reading know the energy response throughout the humanitarian program cycle. And then, produce in a number of different products (satellite derived map products and analysed GIS data, satellite derived reports, Web maps, Dashboards and Statistics and satellite mapping coordination tool (GDACS-SMCS)).
- UNOSAT AI based flood detection model (FloodAI): Sentinel-1 data are processed by machine learning algorithm to output flood extent, vector data. This tool includes the steps of downloading images, developing scripts and generating statistics. User can see as an output of statistics charts/graphs, flood extent and download Data link.
- GDACS – Satellite Mapping Coordination System (SMCS) is a web-based platform implemented by UNOSAT to: facilitate horizontal coordination between satellite mapping organisations and provide GDACS users with info and access to satellite derived analysis and products released during disaster events.
- Case studies: 2021 Southwest Monsoon Season – Nepal, Bangladesh, Myanmar and Thailand floods.

6 Trainings

MIMU's GIS team currently provide Basic Mapping and Basic GIS Training.

- **Basic Mapping Training** consists of three parts – Basic concepts of GIS, MIMU ArcGIS online and Google My Maps.
  Trainer will explain Basic concepts of GIS: the basic concepts of GIS, Cartography, Projection, Type of Coordinates, Map Type and elements of Map (Scale, inset map, grids, symbology, legend and so on) and how to use webmapping developed by MIMU using ArcGIS platform (Selecting layer, Queries, importing external data, labelling, printing map and so on). The last part is how to use Google My Maps (My Map window, creating point, line and polygon layers, changing symbology and color, working with data table, editing features, importing external data, changing base map and sharing your custom map to your colleague or friends).
  This training will take only one day. User without too much knowledge of GIS and would like to get custom map with existing webmapping and Google My Maps.

- **Basic GIS Training** will learn theories of GIS in detail, how to use open-source GIS software (QGIS): GUI interface, QGIS configuration, importing data, Data visualization, georeferencing, creating new shapefiles, calculating attribute data, joining external data, geoprocessing, map layout and QGIS plugins. This training will take five days and on the last day, user have to do mini project with their own data.

- GIS team also provide GPS training when organisation request.
  Other MIMU trainings are Excel distance learning, IM Workshop, Tableau, Orientation on Digital Data Protection and PowerBI.

7 Events

This meeting introduces GIS event/conference and trainings for November and December 2021.

- Modern Remote Sensing and Image Analysis: https://www.esri.com/en-us/lg/industry/education/modern-remote-sensing-and-image-analysis
- Effectively Communicate Risk to Enhance Resilience Using GIS: https://www.esri.com/en-us/lg/industry/public-safety/communicating-risk-reduction

	• Humanitarian Community GIS Day: https://www.esri.com/en-us/lg/industry/humanitarian/humanitarian-gis-day • Creating Apps for Web and Mobile: https://www.esri.com/en-us/lg/product/creating-apps-for-web-and-mobile-with-arcgis-instant-apps-and-appstudio • GIS Day 2021 Event: https://www.gisday.com/en-us/overview • 2021 7th International Conference on Space Science and Communication: https://www.ukm.my/iconspace/ • 2021 NASA iTech Cycle II: https://www.nasa.gov/directorates/spacetech/itech/upcoming_events • 2021 NASA iTech Cycle II: https://www.icc2021.net/ • ARSET - Monitoring Coastal and Estuarine Water Quality Using Remote Sensing and In Situ Data: https://appliedsciences.nasa.gov/join-mission/training/english/arset-monitoring-coastal-and-estuarine-water-quality-using-remote • Migrating to ArcGIS Pro from ArcMap: https://www.esri.com/training/catalog/6010a37d03ffb92c80d3d2d1/migrating-to-arcgis-pro-from-arcmap/ • Python for Everyone: https://www.esri.com/training/catalog/57630436851d31e02a43f13c/python-for-everyone/ • Drone Imagery: Creating Orthomosaics, DEMS, and 3D Mesh: https://www.esri.com/training/catalog/615cc2199367504e70351f71/drone-imagery%3A-creating-orthomosaics%2C-dems%2C-and-3d-mesh/ • ArcGIS Velocity: Real-Time and Big Data Analytics: https://www.esri.com/training/catalog/615cc27a9367504e7035229c/arcgis-velocity%3A-real-time-and-big-data-analytics/ • ARSET - Introduction to NASA's "Black Marble" Night Lights Data: https://appliedsciences.nasa.gov/join-mission/training/english/arset-introduction-nasas-black-marble-night-lights-data • Geneva International Centre for Humanitarian Demining (GICHD) Information Management IMSMA, for Mine Action: https://training.gichd.org/en/
8	## AOB No comments