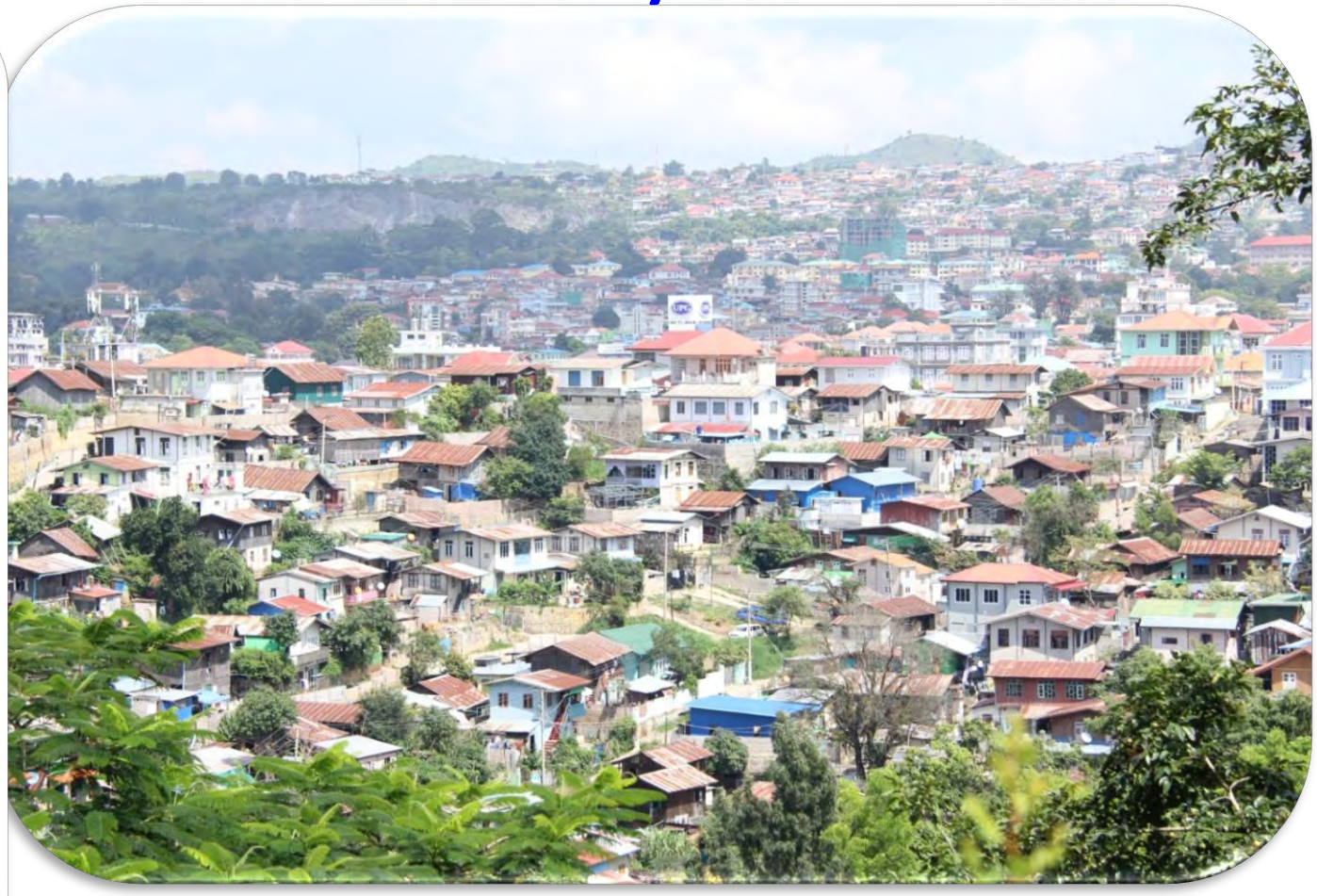
Case Study of Landslide in Taunggyi, RBP Team of Myanmar



DEPARTMENT OF DISASTER MANAGEMENT

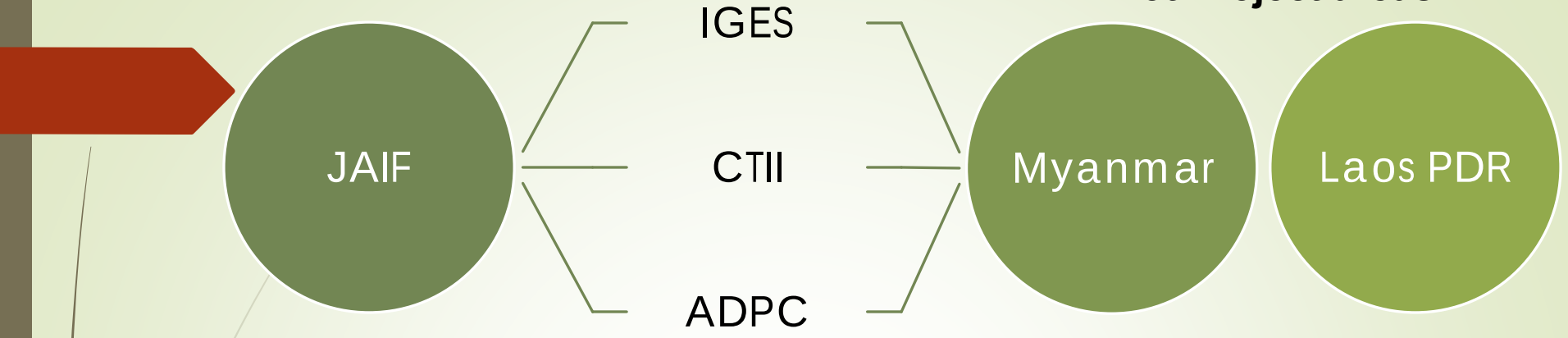
MONREC

DGSE

University of Yangon

GEOLOGY

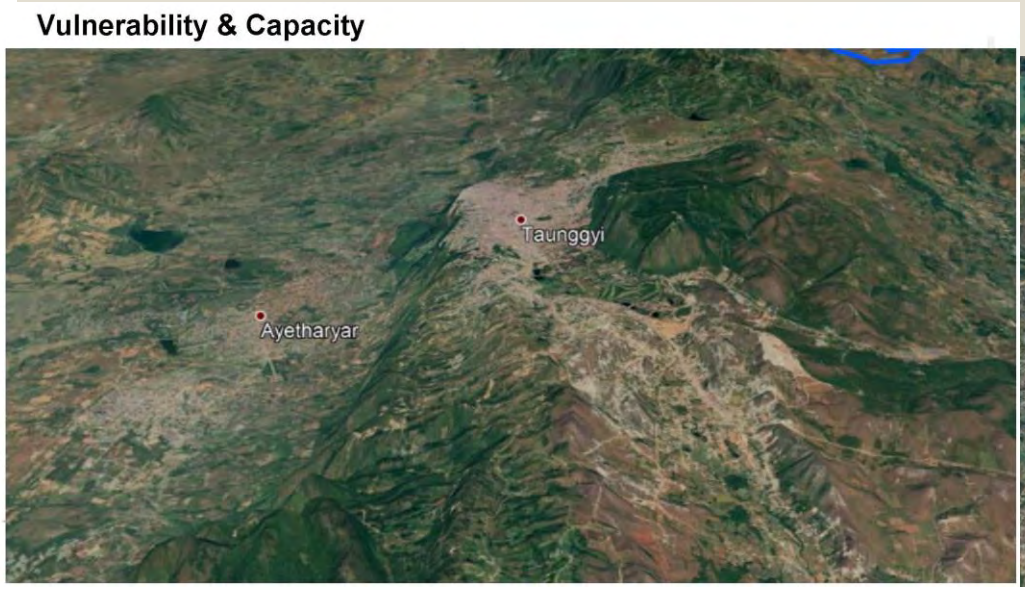
Pilot Project areas

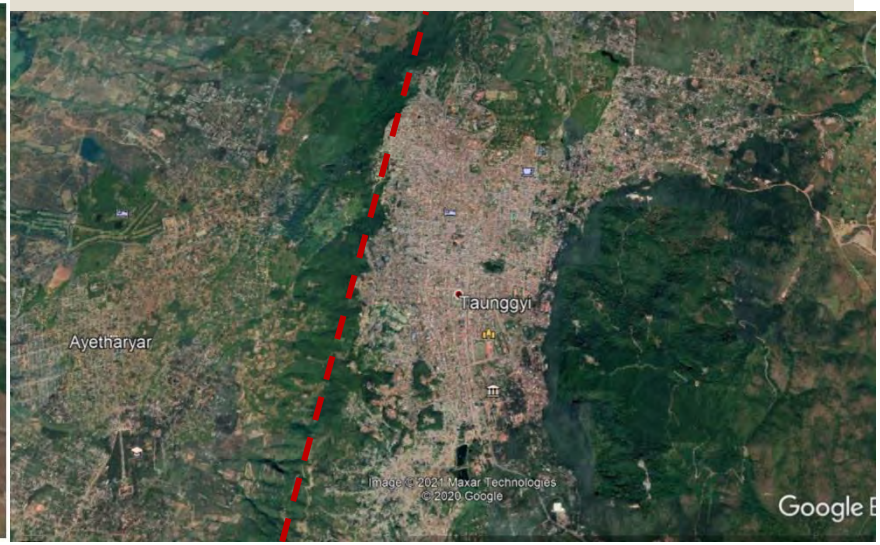


Taunggyi RBP team in Myanmar

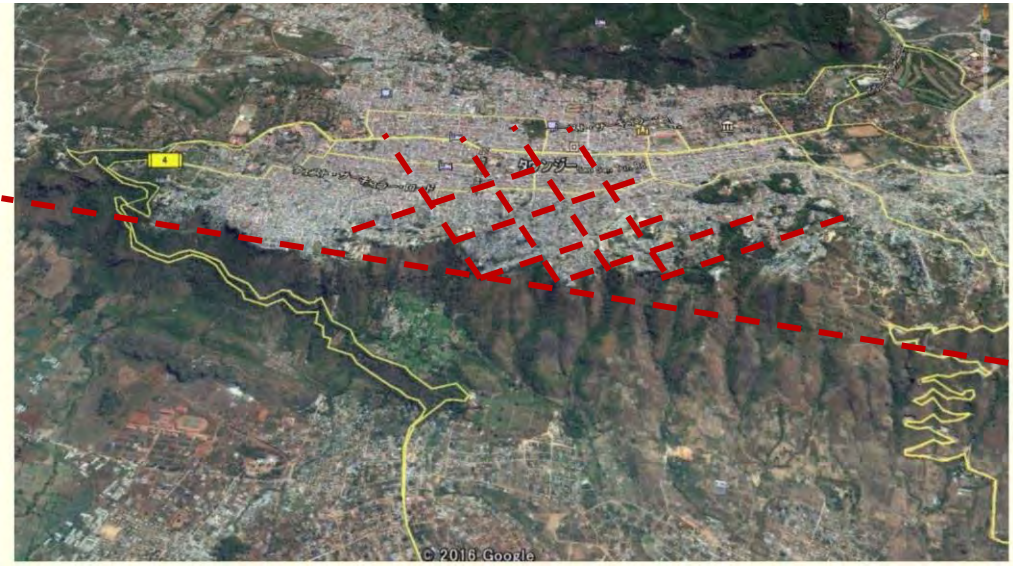
- DDM
- DMH
- DGSE
- UY& Taunggyi Unv.

Google Earth Image and Taunggyi City, Myanmar





Pilot project area for Landslide risk assessment in ASEAN Member States



RBP –Taungggyi , Myanmar Field Survey and Workshop

- ASEAN Landslide Risk Management Field Survey and Workshop was held in Taunggyi, Shan State, Myanmar.
- 3 on-site training workshops and field survey carried out between 11.2018 to 10.2019: knowledge sharing on landslide risk management, field and QGIS application for landslide susceptibility mapping.
- 80 ASEAN members had joined.
- Pilot project period -2018 to 2020.RBP team formed comprising of Department of Disaster Risk Management (DDM) as focal coordinating department, Department of Geological Survey and Mineral Exploration (DGSE) and Department of Hydrology and Meteorology (DMH), Taunggyi University and Yangon University as technical leads.
- 200 sample household survey of landslide risk assessment conducted in 4 communities.

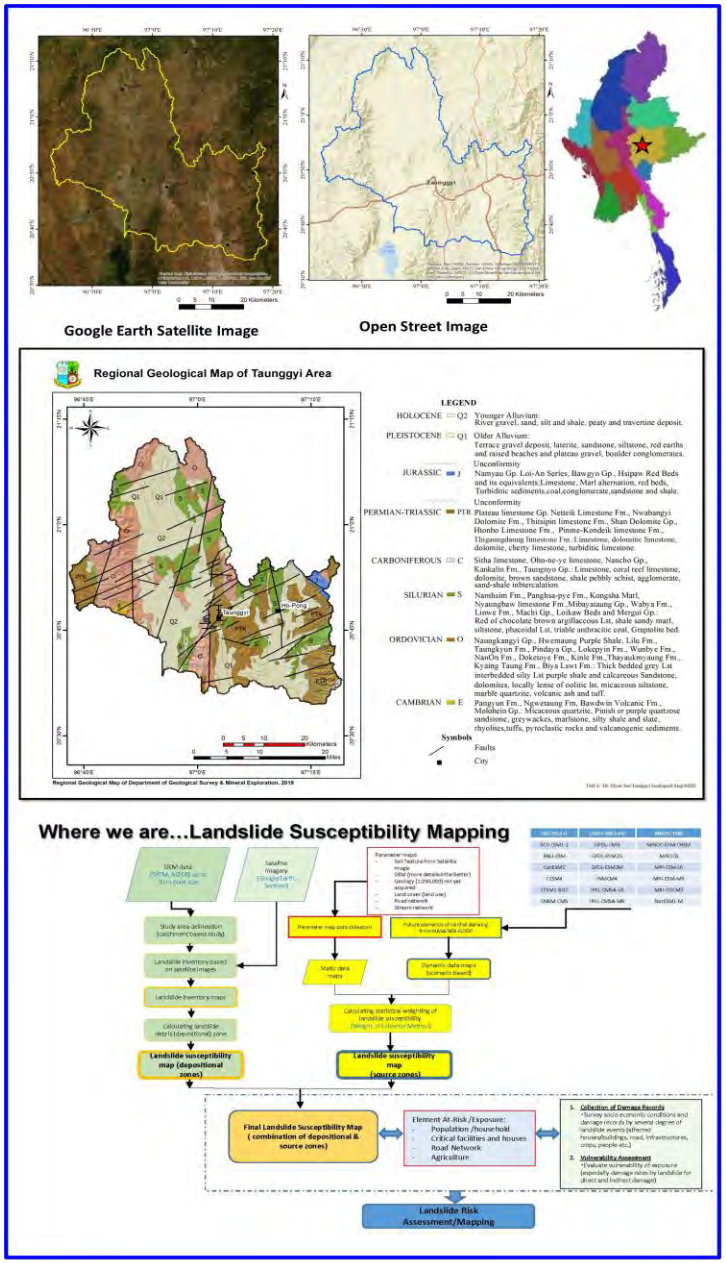
International DDM Experts and Training

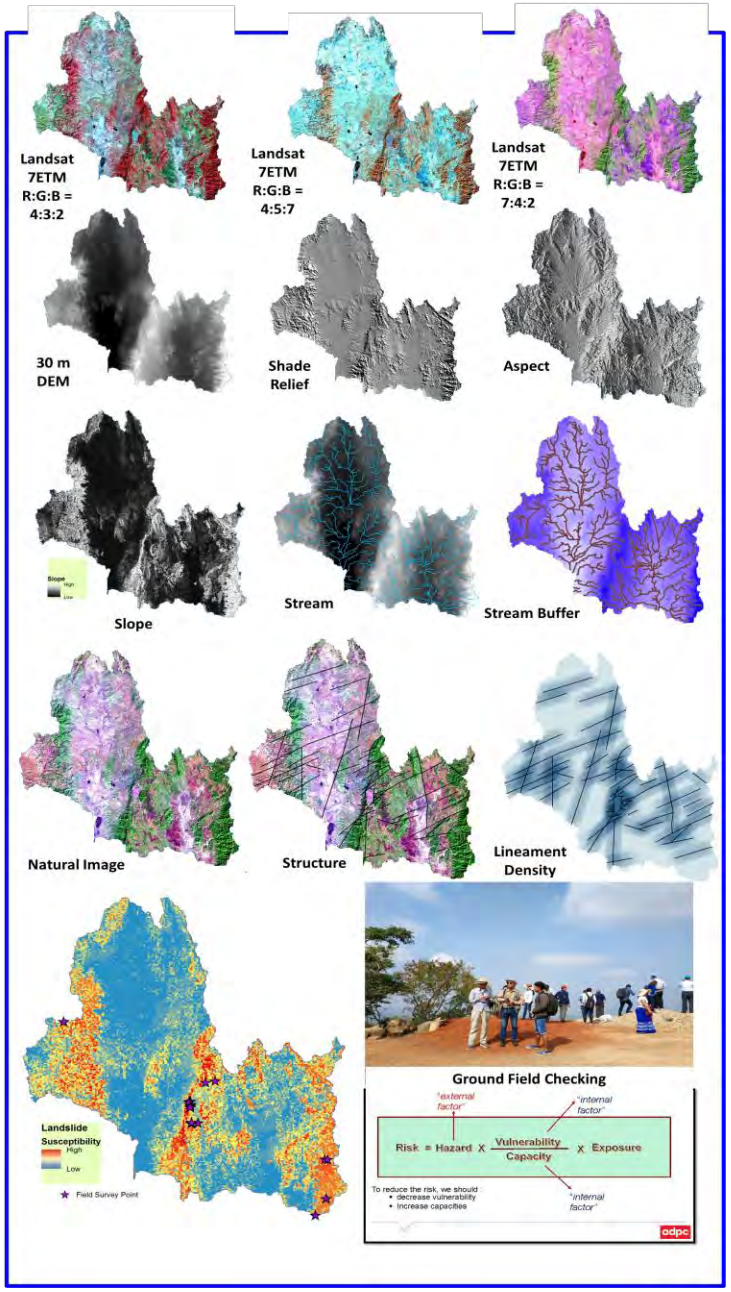
Understanding and characterizing landslide risk integrating climate change.
AMS- landslide risk assessment mapping challenges and capacity gaps

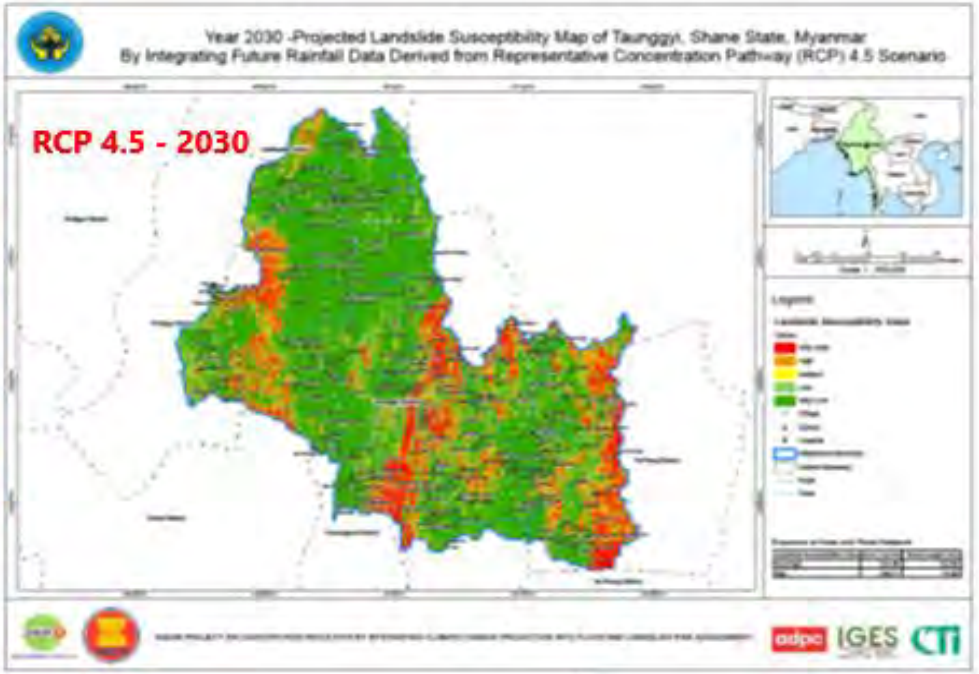
Sharing Knowledge of DDM

- Institutions, tools, resources and landslide risk assessment team formation

Landslide Risk assessment by WOE method







Length of Road exposed to high and very high landslide susceptibility zones

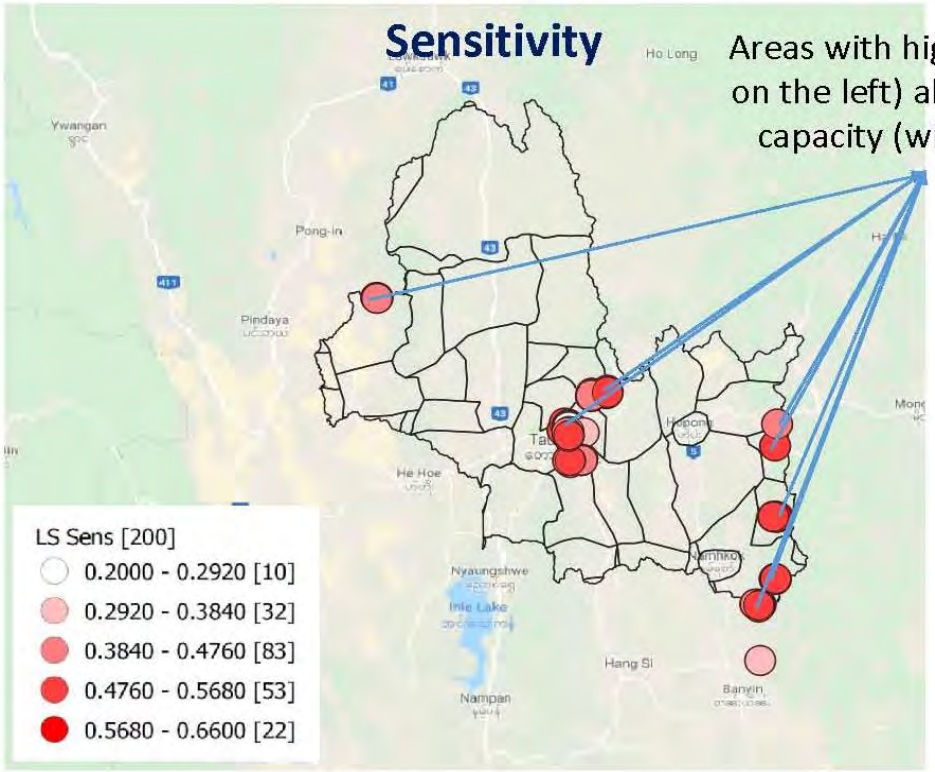
Class	2030	2050	2080
High	79.50	105.66	143.49
Very High	113.79	169.05	230.99
Sum (Total)	193.29	274.72	374.49

Household Survey around River Basin Pilot area of Taunggyi

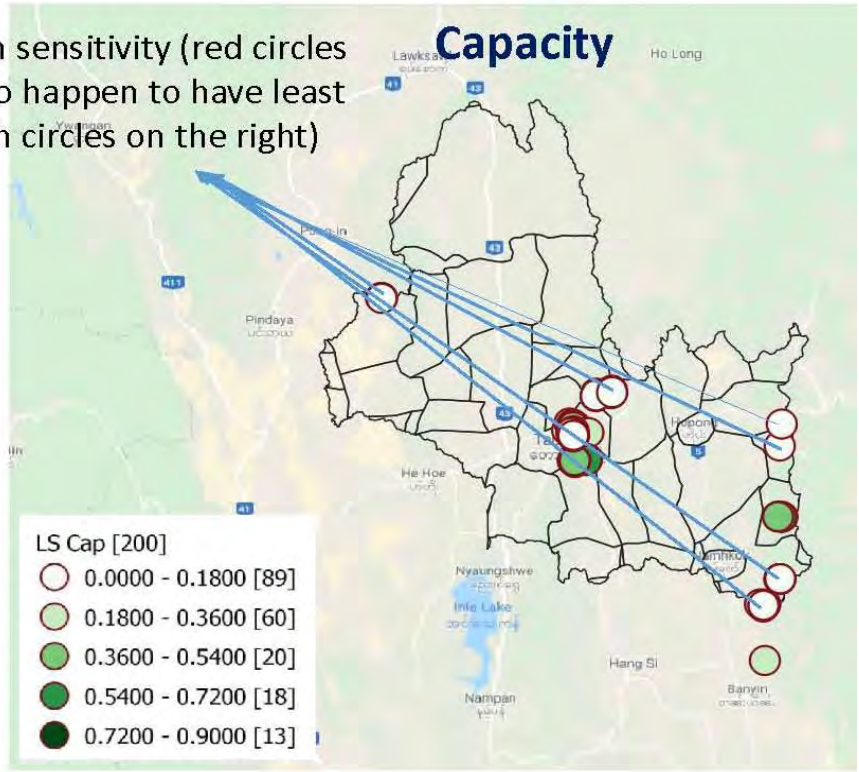
- Chanmyatharsi Quarter
- Nyaungphyu Quarter
- Yadanarthiri
- Kyaunggyisu
- Kyauktayan, Hopone
- Nann Mu Htein, Baw Saing
- Htee tain+ Sung Lann
- Htan Ae, Hopong
- Shwetaung+ taungtanshe

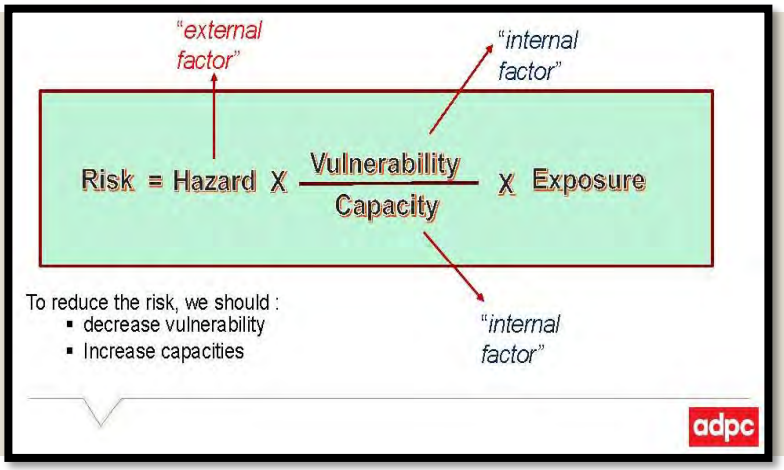
Household Survey around River Basin Pilot area of Taunggyi

Landslide Susceptibility of Taunggyi



Areas with high sensitivity (red circles on the left) also happen to have least capacity (with circles on the right)

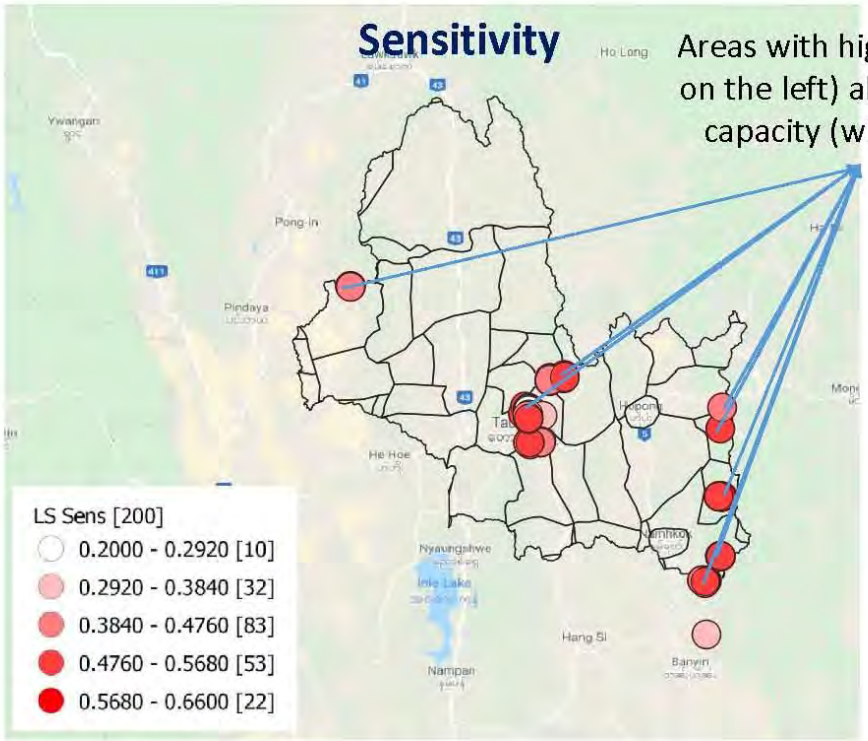




Household Sample Surveys in Myanmar: Demographic Characteristics

- Sample location: Taunggyi
- Total No of samples: 200
- Total sampled population: 952
- Average family size: 5
- Sex ratio of sampled HHs: 0.82
- Average annual income of the surveyed HHs: 2484 USD
- Average age of the sampled population: 31 years
- Predominant gender of the respondents: 55% female
- % of surveys responded by head of the household: 43%

Where people have more capacity and where more sensitivity?



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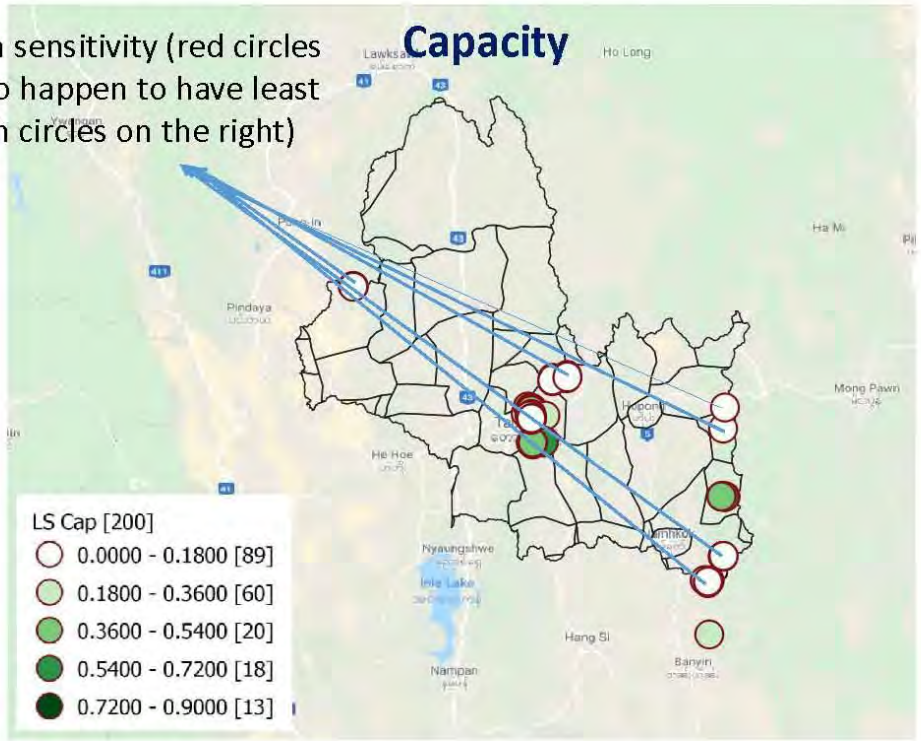
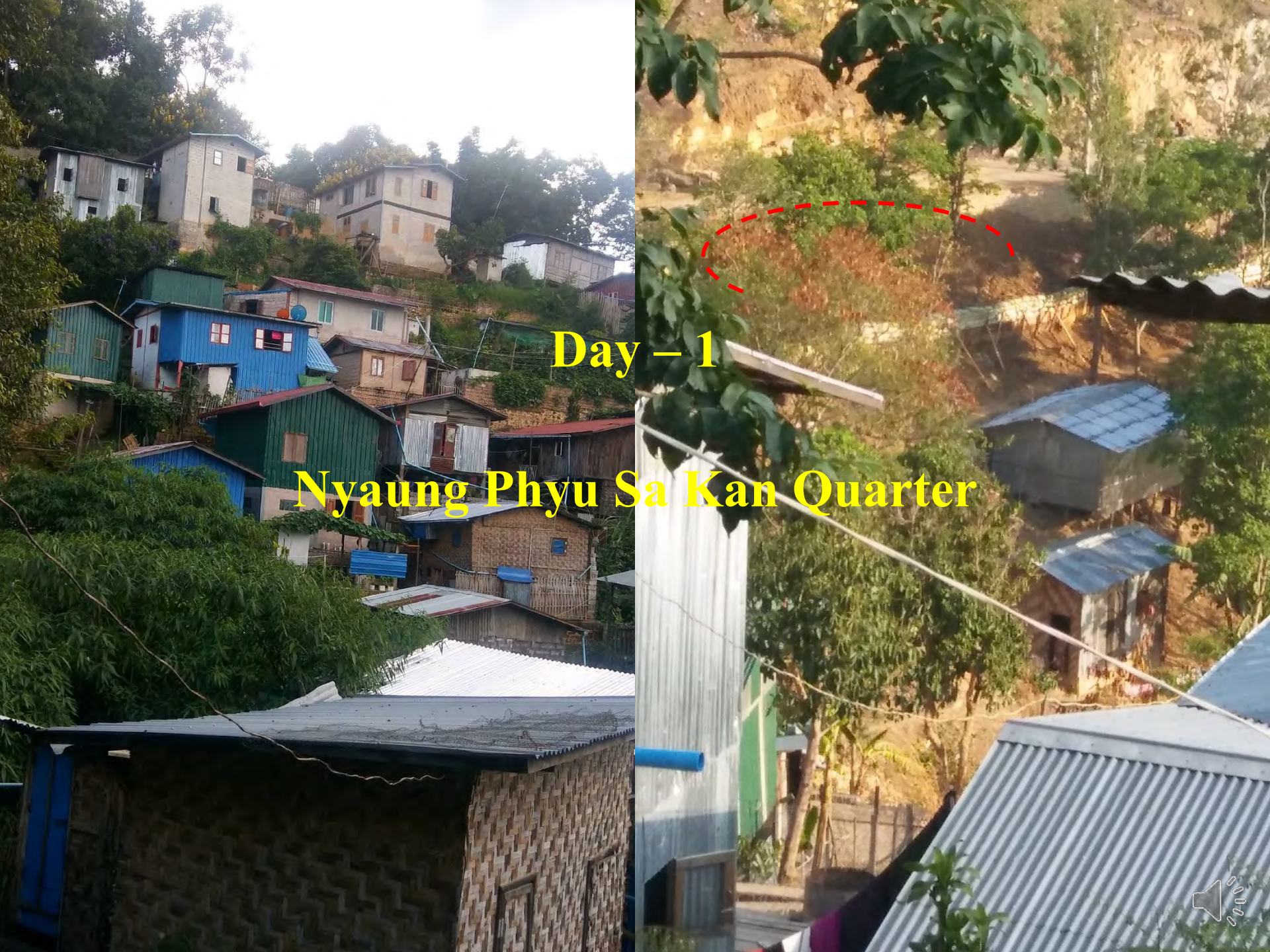


Overlaying these over the landslide susceptibility map will give the real picture of who is more vulnerable and who is not

Disaster Risk Management Workshop

Landslide risk assessment strategy development

Training before field survey of community based landslide risk assessment


Day – 1
Nyaung Phyu Sa Kan Quarter

Nyaung Phyu Sa Kan Quarter


Day – 2
Chanmyatharsi & Yadanar Thiri Quarters

Chanmyatharsi & Yadanar Thiri Quarters

Chanmyatharsi & Yadanar Thiri Quarters

Myoma & Kyaunggyisu Quarters

Community / Public base Disaster Risk Reduction

Vulnerability assessment methodologies


Day – 3
Kyaunggyisu Quarter

အင်အား လိုအပ်ချက် ဖြည့်တင်းရန် ဆောင်ရွက်နိုင်မည့် နည်းလမ်းများ

- ~~ကြက်ခြေနီ ၊ ရဲကာနီ ၊ ရေစုပ်စက်~~ C.B
- ရဲကာနီ - + G + CB
- ရေစုပ်စက် - (G)
- ဆေးဝါး (+ CB)
- ငွေ (ဓါတ်ဆီ) (C.B)
- ရန်ပုံငွေ (C.B)
- ရေမြောင်းစနစ် (G)
- လမ်း (ထိခိုက်နိုင်ခြေရှိတဲ့လမ်း) (G)
- သဲအိတ် (CB)

Community based participatory landslide risk management strategy

Discussion of Stake Holders from multidisplinary Depts.

Landslide risk management action plan and implementation strategy

Landslide Risk Management Strategy development- Action plan

Duration plan

short, medium and long term?

Design one project idea each ministry/department would like to implement to mitigate landslide risks (**objectives, activities, timescale**)

Resource Plan

Available provisions currently are adequate

Need external resources as requirement exceeds the annual budget allocations

Capacity for implementation

House capacity is not adequate and needs Technical assistance

Policy needs

Present policy and Institutional arrangement are adequate

Identify specific **policies/guidelines/procedures** your department/ministry is responsible benefit from these project technical or financial.

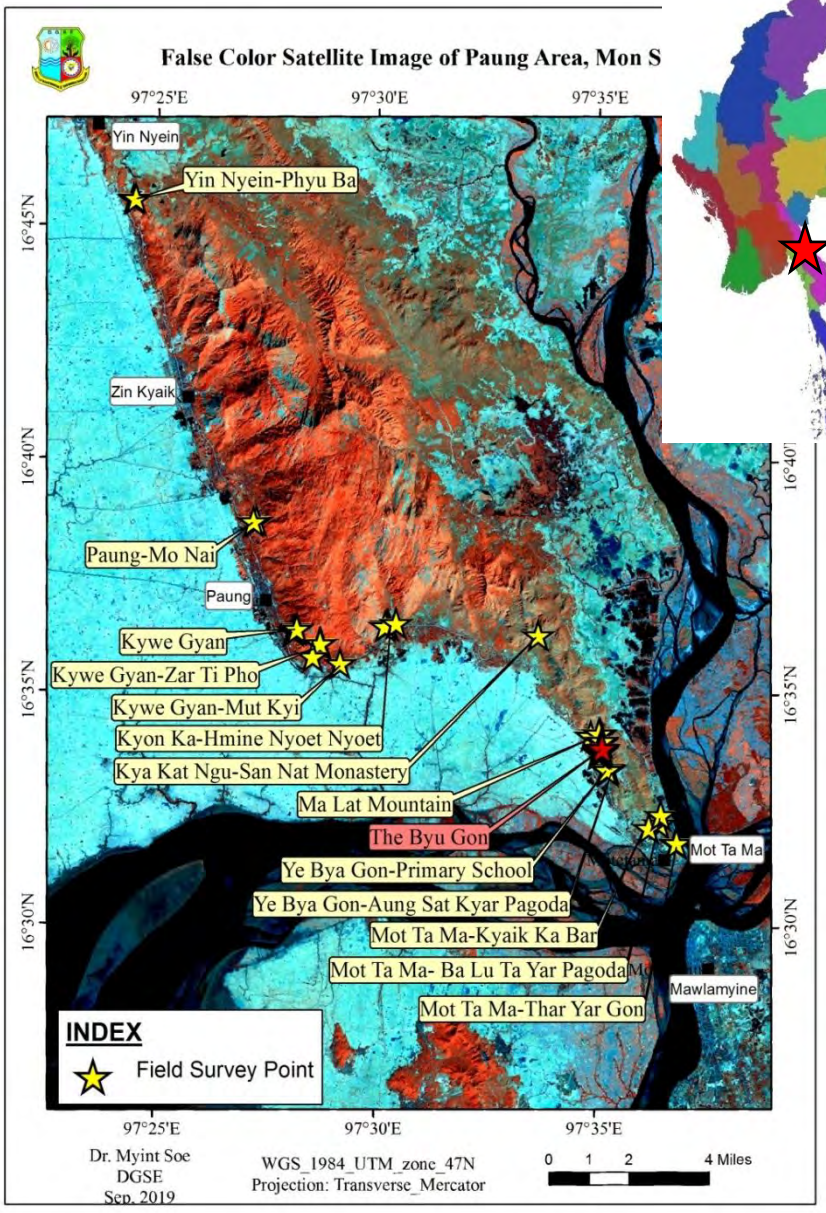
Current benefits from ASEAN Pilot Project Methodology

University	DGSE
• Three Master students in detail studies of community based landslide risk assessment with integration of climate change in Taunggyi • Two Master thesis in Paung Landslide area (zonation)	• **Naypyitaw – Pinlaung Car Road** • **Paung Landslide** • **Landslide Social and Economic Assessment in Hakha, Chin State**

ASEAN Pilot Project Methodology Application on Naypyitaw – Pinlaung Highway Road (Aug, 2019)

ASEAN Pilot Project Methodology Application on Loikaw – Taungoo Highway Road (Aug, 2019)

ASEAN Pilot Project Methodology Application on Paung Landslide, Mon State, 9 Aug 2019



The death toll from a landslide in Thae Phyu Gone village killed 72 and 47 injured

ASEAN Pilot Project Methodology Application on Paung Landslide, Myanmar (9 Aug 2019)

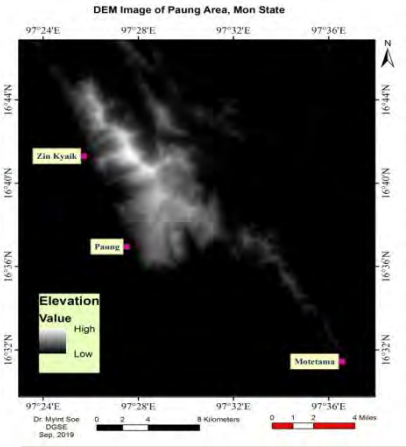
ASEAN Pilot Project Methodology Application to Paung Landslide, Myanmar (9 Aug 2019)

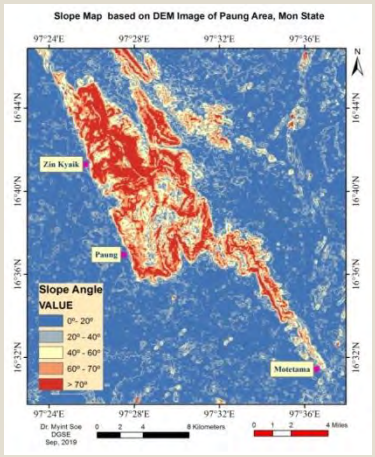
LANDSLIDE GEOHAZARD SURVEY FORM
Department of Geological Survey and Mineral Exploration

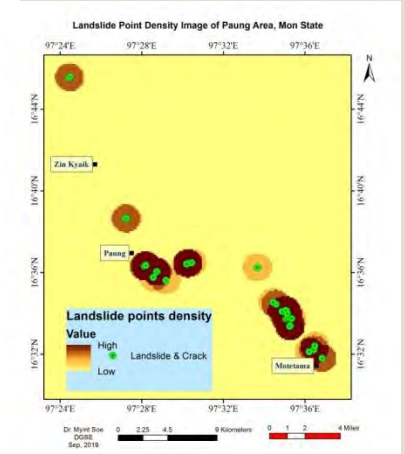
Inspected by - DGSE Landslide Geohazard Survey Team	**Date** - 4.9.2019

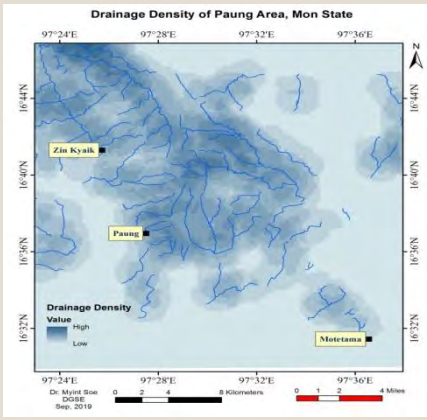
No. - (L - 014), **Name** – Ma Latt Taung pagoda
Location/Village name - (Kan Phyu), **Township** - (Paung), **State & Division** - (Mon State)
Map Reference (MMD 2000) - UTM Map No. 1697/10
- 47Q/ 349000E, 1832271N (Elev 152 m)

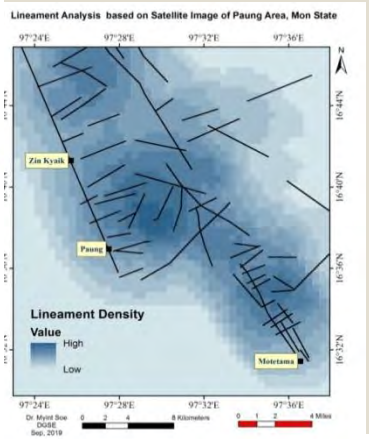
1	Group/ Formation	Martaban Beds
2	Age	Late Permian to early Triassic
3	Rock Type Group	Sedimentary Rocks
4	Lithology	Milky white coloured highly jointed, medium to thick bedded, quartzose sandstone interbedded with bluish gray coloured, highly jointed, thin bedded soft and friable mudstone.
5	Weathering Grade	Highly weathered
6	Geological Features	Bedding - 360°/22°E, Shear Plane – 330°/75°SW Gully erosion occurs along the slope.
7	Joint Information	J1 - 10°, J2 - 130°, J3 - 350°
8	Type of Landslide	Rotational Landslide
9	Date & Time of Landslide	9.8.2019
10	Dimension of Landslide	Length - 130 m, Width – 50 m, Height – 5 m
11	Slope Angle	50°
12	Slope Type	Natural
13	Distress Location	 (Middle)
14	Distress Sign	Crack, Erosion
15	Settlement at Downslope	Yes
16	Main Vegetation Cover Type	Fern, Shrub, Jungle
17	Vegetation Cover Condition	Average
18	Rock Exposures	Yes
19	Fault Line	Yes
20	Drainage	Yes
21	No. of Cracks	1
22	Cracks Alignments & Distance	335° & 50 m
23	Cause of Landslide	Poor Material, Erosion, Geological
24	Failure Materials	Soil and rocks
25	Evidence of Past Failure	No
26	Injury/ Loose Life/ Property Damage	No. of people Injured - 0 No. of people killed - 0 No. of damage buildings - 0
27	Failure Potential	High
28	Percentage of Natural Induce Hazard	100%
29	Percentage of Human Induce Hazard	0 %

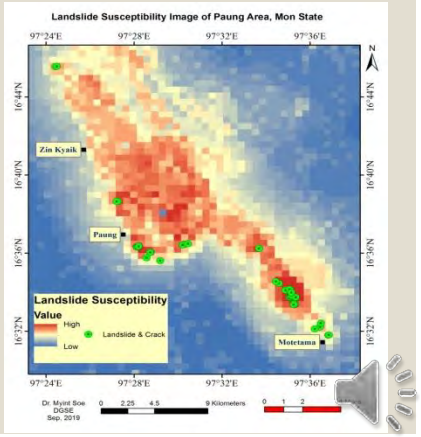












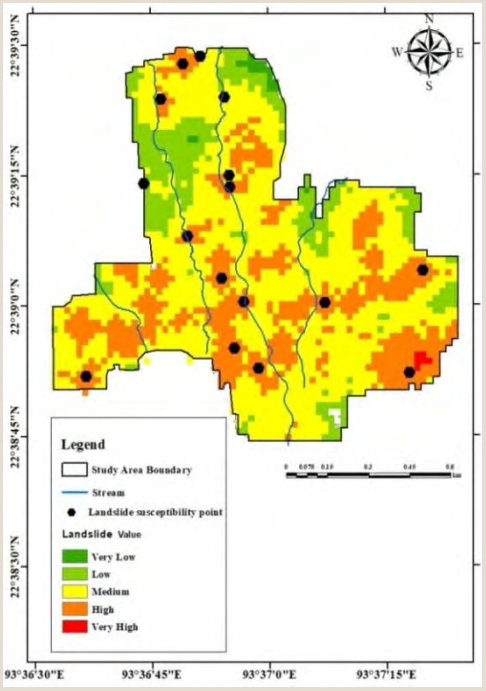
Drone Image and Local People easy understanding the Landslide Zoning Map, Hakha, Chin State (August, 2020)

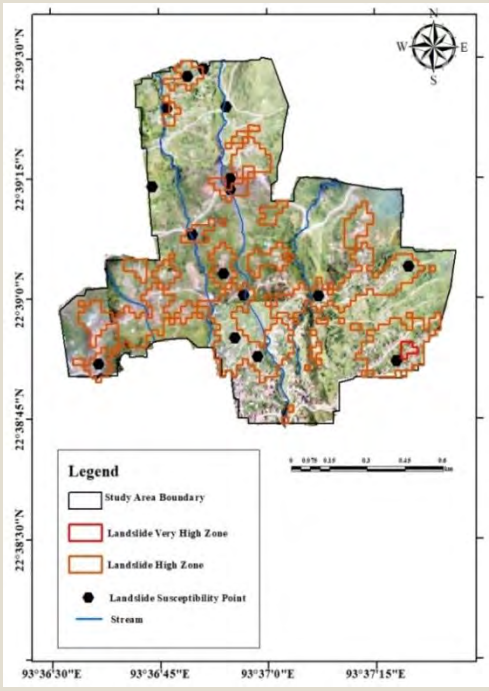
Better View Drone based Image (un-zoomed)

Google Satellite (un-zoomed)

Better View Drone based Image (zoomed)

Google Satellite (zoomed)





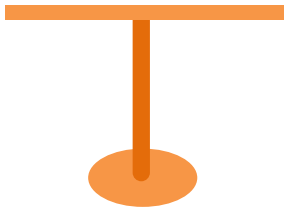
Landslide Social and Economic Assessment in Hakha, Chin State (Aug, 2020)

Landslide Disaster Reduction Awareness to Local Community

Prioritize actions/strategies related to Priority-1 (hazard and risk identification, analysis and evaluation) :

Priority - 1

Increased understanding of landslide risk



1. Initiate/encourage the formation of a technical working group on landslide DRRM which comprises cross-sectoral agencies such as NDMO,DMH,DOR, Academia, etc.
2. Adapt the gained knowledge to identify and map the landslide risk in other part of the country which are prone to landslide (using the guideline and the case study developed under the ASEAN DRR-CCA project)
3. Initiate/encourage more detail mapping on the areas identified as high and very high landslide susceptible.
4. Encourage community-based landslide risk mapping especially for the community that are identified /located in high and very high prone to landslide.
5. DDM has been carried out the Shan State (North& South) hazard maps, and also hazard map of each district for 10 years plan.
6. Need to establish the volunteer association and young association, all associations.
7. All the people in village in landslide prone area need to participate (DDM).

Priority -2

Strengthened disaster risk governance to manage disaster risk;

Prioritize actions/strategies related to Priority-2 (engagement of NDMO, DMH,DOR, Academia and other relevant agencies in landslide DRR governance at different levels):

From Local authorities

- Start from secretary to Volunteers as well as all other organizations should be incorporated. (not enough the gov. dept & quarters)
- Social organization, young organization, Woman affair federation from each quarter should attend every monthly meeting/ workshop concerning with hazard.
- Representative who'd attended the training should share again in quarters/wards

Department

- Active leader is essential and should be assigned.
- Workshop should be done regularly.

Priority -2

Strengthened disaster risk governance to manage disaster risk;

Prioritize actions/strategies related to Priority-2 (engagement of NDMO, DMH,DOR, Academia and other relevant agencies in landslide DRR governance at different levels):

From Head of Quarter,Head of(100 housholds)- ShweTaung)

There are four waste-water pipelines that across the quarter, which had been blocked by the garbage. Among them, three has been cleaned by their own capacity, one is still left and needs to ask support from TCDC.

Region (3) on 21-9-2019, 10househols(56 nos.) had been destroyed by flood associated landslide, restricted land to reconstruct.

AD, DDM

All the people in landslide prone area should be participated.

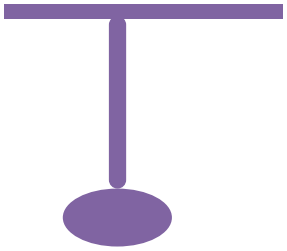
Yadanar Thiri qtr.

Their quarters have already the associations including social,young, women…etc. They want the training from DDM.

Remark
DG, DDM - he agrees to provide the training. Teachers and Students from Taunggyi University are willingly to support for training.

Priority-3

Invest in DRR for resilience



Prioritize actions/strategies related to Priority-3 (prevention and mitigation to reduce risks in sectors through structural and nonstructural measures) :

1. Need installation of public address system (PA system) in slope areas Taunggyi. (ST)
2. Training , capacity building, sharing knowledge (poster, signboard) (LT).
3. Existing houses on the slope need to be reinforced, road(sensitive land use, conflict with legal land use), Improper land use (LT)
4. The slope failure in 2019 Konethar, Need more resilient structure at the base of the slope, (problem refilled soil) (MT-LT), Need fund of resilient structure for long term.
5. Legal area in slope area needs evacuation road, relocation of settlement (MT-LT)

Remark

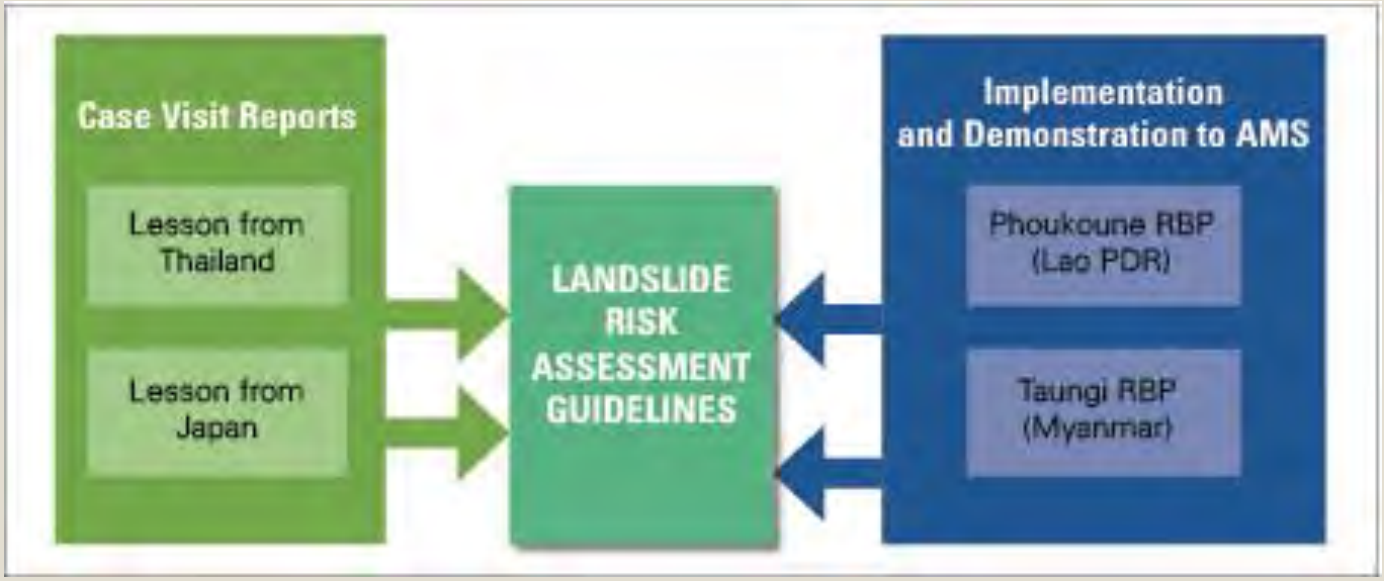
DG, DDM – The problems and risk of hazard of some sensitive landuse area on slope shall be discussed with senators.

Priority-4

Prioritize actions/strategies related to Priority-4 (Preparedness for effective response and recovery through Landslide Early Warning System/LEWS) :

Enhanced disaster preparedness for effective response, and to "Build Back Better" in recovery, rehabilitation and reconstruction

1. Initiate the establishment of community-based early warning system prioritizing for the community located in high and very high prone to landslide. ST, MT
2. Construct Database landslide inventory, (Lat , Long, rainfall (1, 3,7 days before and after))ST, MT
3. Need to install DAN application (all Heads of quarters).ST
4. Announce with Megaphones /PA system based on specific area. ST
5. Viber group, Fb group(Heads of quarter) to announce urgent condition. ST



Flood and Landslide Risk Reduction Measure and Risk Assessment
ASEAN Project on Disaster Risk Reduction by Integrating Climate Change Projection into Flood and Landslide Risk Assessment
28 October - 8 November 2019
Japan

Regional Workshop for Development of Guideline Integrating Climate Change Projections into Flood and Landslide Risk Assessment
ASEAN Project on Disaster Risk Reduction by Integrating Climate Change Projection into Flood and Landslide Risk Assessment
13-15 February 2020
Lao PDR

Results & Conclusion

- **Improved technical skills on risk assessments for DRR decision making and application**
- **Strengthened cooperation and coordination among Disaster Risk Reduction Network in ASEAN**
- **Improved knowledge of Disaster Risk Management**
- **Enhanced landslide risk knowledge-sharing and bridging information/coordination gaps**
- **Strengthened inter-agency coordination for managing landslide risk**
- **Output ASEAN Landslide Guideline & Technical Reports**

Thank for your Attention