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Evaluation of Pan-sharpened Image for Human Settlements Mapping: A Case of South East Asia Cities

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1. OBJECTIVE

To evaluate Landsat ETM Pan-sharp Image for human settlement mapping

2. DATA

Advanced Land Observing Satellite ALOS (JAXA)
Landsat ETM (NASA)

3. PROCESSES

- Data Importing and sub-setting
- Pan-sharpening Process (Landsat ETM 15mX1 + Landsat 30mX6, Thermal band omitted)
- Signature Evaluation in both ALOS and Landsat ETM
- Multispectral Classification

4. LITERATURE REVIEW

4.1. Comparison of Spectral Profiles

ALOS: Better spatial resolution but poor in spectral resolution (10mX4)
Landsat ETM: Better spectral resolution but poor in spatial resolution (30mX7)
Landsat ETM Pan-sharp: Better spatial and spectral resolutions (15mX6)

4.2. Applications

Previous study shows the vegetation index derived from ALOS images are suitable for urban area applications such as modeling of urban green space walkability to calculate greenness score by specific home address or walking routes (Lwin and Murayama, 2011).

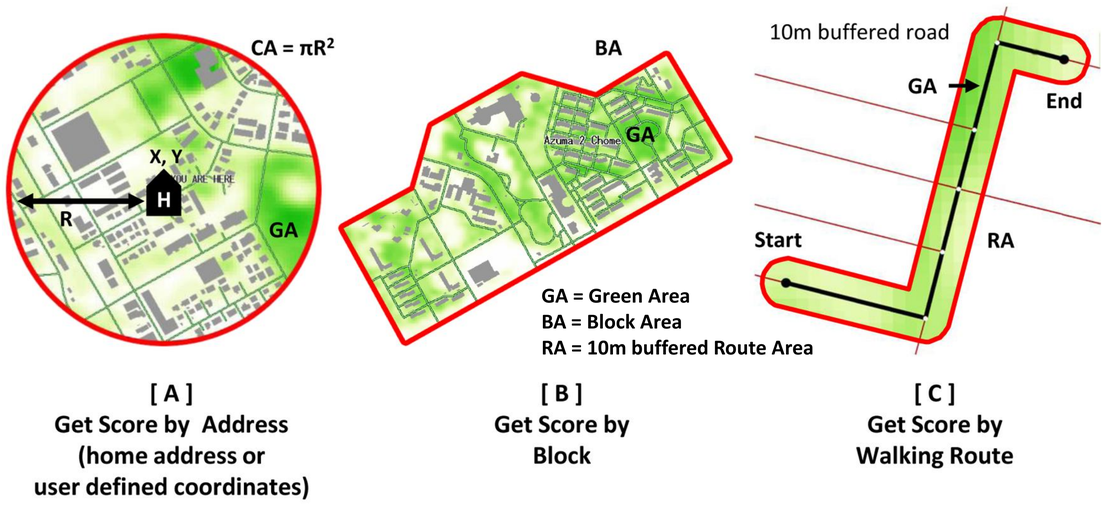

Figure 1: Three urban green spaces walkability models based on ALOS NDIV data

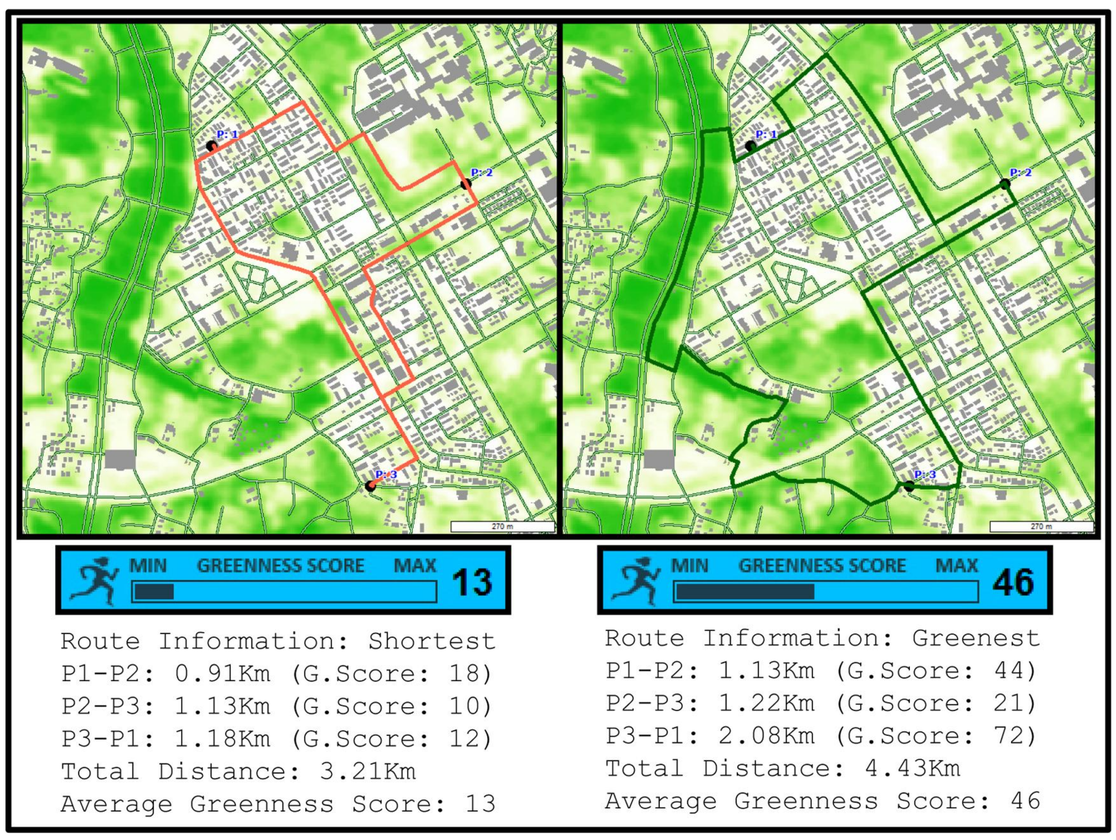

Figure 2: Finding the shortest path or greenest path in Tsukuba City by interactive Web-GIS based on ALOS vegetation data

5. RESULTS

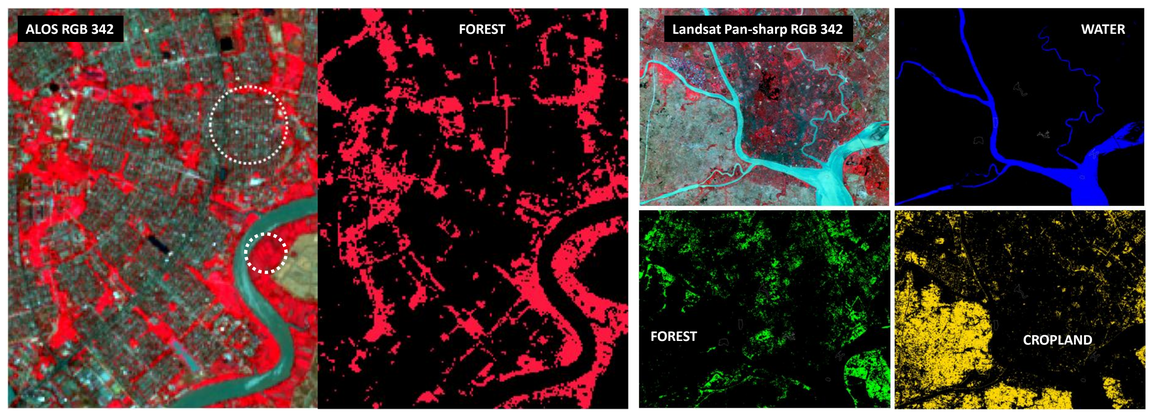

Figure 3: Signature collection from ALOS (left) and Landsat ETM (right)

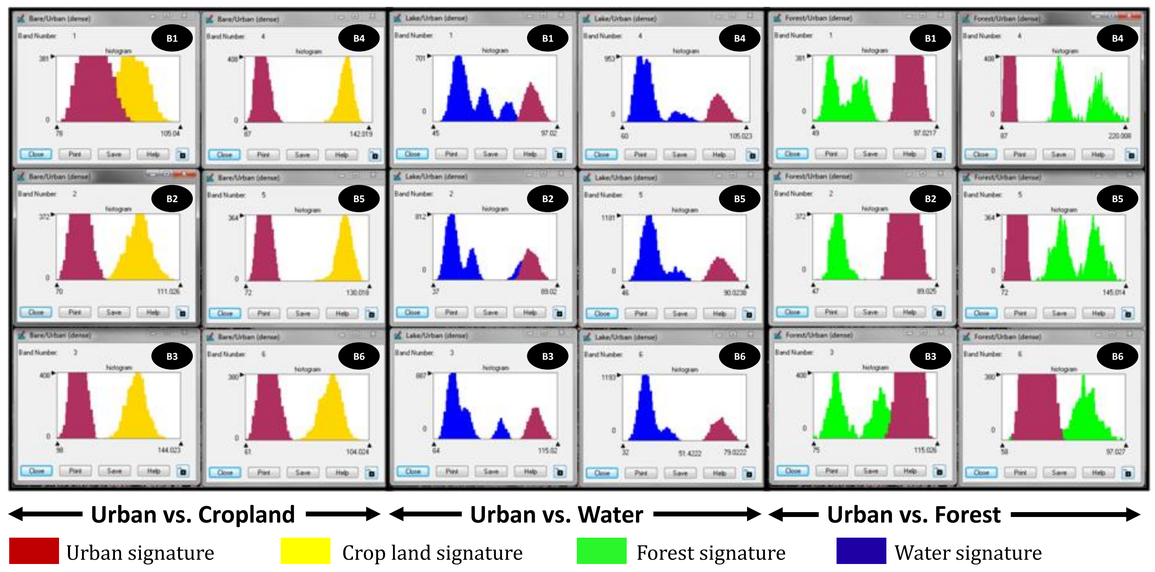

Figure 4: Signature evaluation between urban and other land covers in Landsat ETM Pan-sharped image

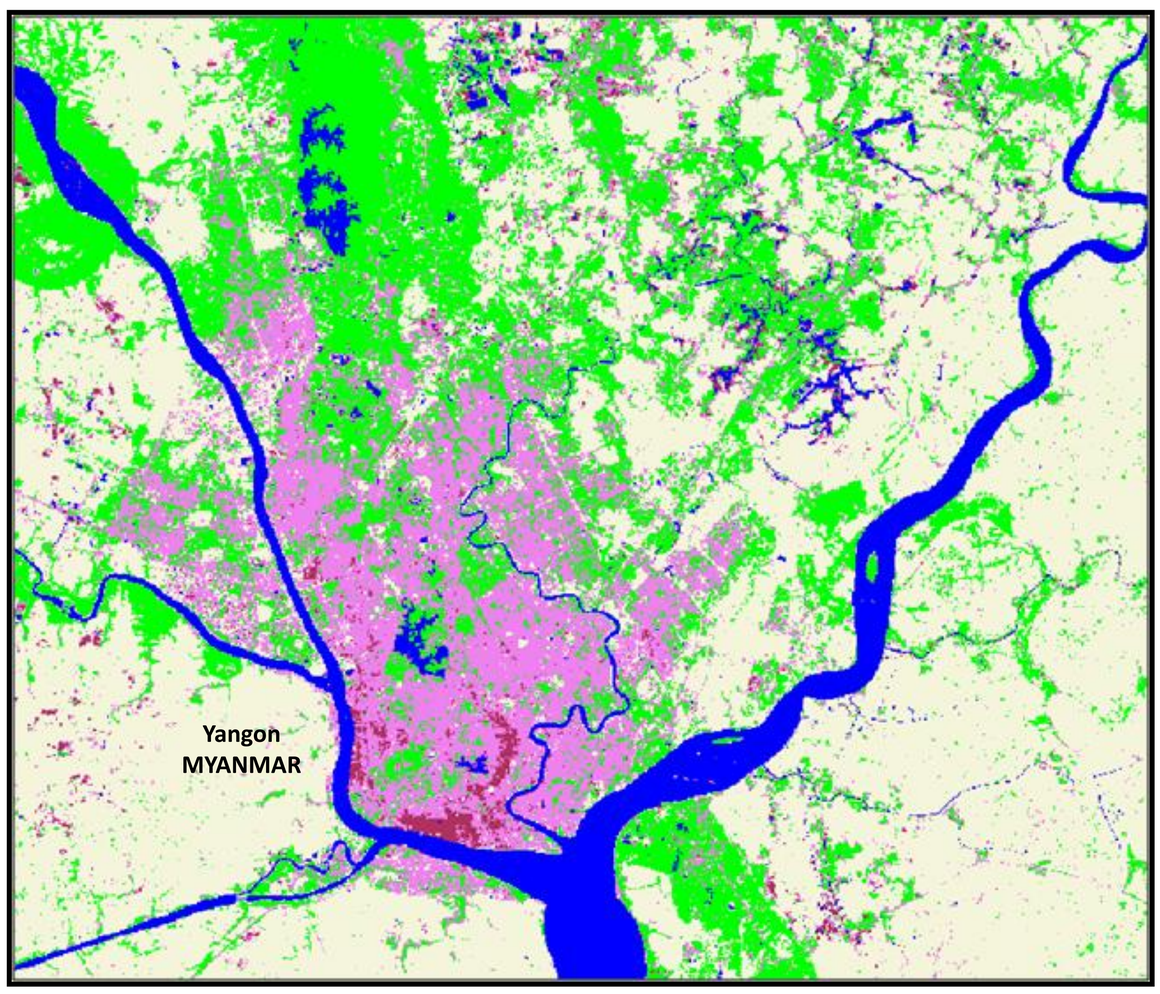

Figure 5: Map of human settlements derived from Landsat ETM Pan-sharpened image of Yangon City, Myanmar in 2006.

6. DISCUSSION

Landsat ETM Pan-sharpened image (15m X 6 Bands; Thermal band omitted) is suitable for delineation of human settlements areas in South East Asia cities.
This data can be used for further population estimation and urban studies.

ACKNOWLEDGEMENT

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Landsat ETM: NASA Landsat Program, 2003, Landsat ETM+ scene L71132048_04820060225, SLC-Off, USGS, Yangon, 02/25/2006.

REFERENCES

Lwin, K. K., & Murayama, Y. (2011). Modelling of Urban Green Space Walkability: Eco-friendly Walk Score Calculator, *Computers, Environment and Urban Systems*, (DOI information: 10.1016/j.compenvurbsys.2011.05.002), (In Press).

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