

Considering the Astro-tourism Potential in Indonesia using GCIS-MCDA

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Abstract. We developed a method to identify potential astro-tourism sites by considering parameters characteristically relevant to astronomical observation such as air quality, dark sky quality, annual average cloud coverage, as well as terrain feature. Applying this method on Indonesia by perusing data from Geographic Information System and applying Multi Criteria Decision Analysis we identify a number of potential astro-tourism sites. We cross correlate this with Indonesia Tourist Destination to produce a list of recommended sites. Fulfilling the astrotourism criteria is one sure way towards sustainable tourism.

Keywords. Astro-tourism, Geographic Information System (GIS), Multi-criteria Decision Analysis (MCDA)

Indonesia has numerous tourist destinations which makes tourism one of Indonesias economic leading sectors. However, sustainability aspect is a concern, mainly due to various environmental issues yet to be addressed. We introduce astro-tourism – as a form of sustainable tourism – in several potential existing tourist destinations.

We examine the astro-tourism potential in Indonesia, in particular the 80 points of strategic natural tourist destinations, which includes 6 geoparks. We utilized Geographic Information System (GIS) (Malczewski (2006)), considered four astro-climatological factors (Graham *et al.* (2005)) such as artificial light, aerosol optical thickness (AOT), altitude and cloud coverage. We set up a classification model for the astro-tourism potential sites over those 80 destinations. as an approach to prioritize the development strategies for astro-tourism in potential location.

About 73% of Indonesian area has good night sky with low light pollution and nearly half of area has good air quality suitable for astronomical observation. With nearly 90% of the area having more than 70% annual cloud coverage a tourism strategy needs to be developed. This leads to 14 out of the 80 investigated existing tourist destinations recommended as astro-tourism sites.

Indonesia has considerable astro-tourism potential. The success of astro-tourism will not only enhance local economy development but also be beneficial for the advancement of astronomical works in Indonesia, public science education, whilst ensuring sustainable development through environmental protection.

References

- Graham et al. 2005, *Meteoroligal Aplications*, 12, 77-81
Malczewski, E. 2006, *Int. J. Geogr.Inform. Sci*, 20, 703-726