

## <<Taikichiro Mori Memorial Research Fund>>

### Research achievement report (2012/02/06)

- **Name of the Research Leader:** Balt Suvdantsetseg
- **Name of the Research Project:** Conceptual framework of decision support system with GIS and participatory approach for ecotourism planning process
- **Affiliation:** *Graduate School of Media and Governance*
- **Type of Program:** *Doctoral Program*
- **Student Year:** *3rd*
- **Email Address:** [suvdaa@sfc.keio.ac.jp](mailto:suvdaa@sfc.keio.ac.jp)

#### Acknowledgement

I would like to express my deepest gratitude to committee of Graduate School Program Grant for granting this opportunity to support my research survey in the field area, during 2011. This foundation was supported the research expedition expenses and other necessary items expenses that it given me great honors to recollect the datasets and to observe visitor and local's opinion due to study objective which was very important for my doctoral thesis and research opportunity.

#### Research objective:

The main purpose of this study was to present a framework of Decision Support System (DSS) using capabilities of Geo-spatial techniques and participation of local communities for the ecotourism planning process. The survey goal is to validate the outputs of Geo-spatial analysis for the formulation of the ecotourism spatial planning, reevaluate the alternative ecotourism activities considering its impacts on environment, social, and economy using participation of local communities, and also to check how it is useful or works and how satisfy it the decision makers and stakeholders in the case area.

#### Background and significance:

A key area for the ecotourism development in Mongolia is the Tavan Els sanatorium that attracts visitors by the natural sand sauna treatment from inside of country and abroad. In the recent years, because of the pristine surroundings and the best treatment output, the number of visitors has been raised that was leading cause of problems around region. Therefore, local development planners have a plan to improve its economy and nature conservation by utilizing ecotourism industry based on the local natural and recreational resources. Thus, main goal of this project is to protect the unique landscape resort for the future generation, leading public awareness on environment conservation and to regenerate the local economy and traditional culture in the one of Mongolian valley.

The challenge of ecotourism development lies in the complexity of the issue. Because of it is involving many sectors, including tourists or consumers, regional and national government agencies,

managers of protected areas or environmentalists, NGO, local communities and many others which difficult to organize in one point. Ensuring that all community able to participate in a challenge of participatory planning. In this case it is useful method. On the other hand, the creation of ecotourism spatial planning for a region is playing in many occasions of the lack of applications of GIS tools. It is one of the developed Decision Support System (DSS). Until now, this area is not yet well managed or operated. GIS can be applied which area suitable for developing destinations based on attractive aspects of culture, nature, traditional events, scientific interests, related facilities and availability of accesses in the region.

### **Study area:**

The Biger city is situated in the Gobi-Altai province, at south western of Mongolia that is largely remoteness area from centralization of economic and population centres see fig2.5. There are 5 villages (Bag in Mongolian) namely 1, 2, 3, 4, and 5 governed by this city. Biger region covers an area of 3730 square kilometres, sheltering 2249 inhabitants (male 1143, female 1106), 635 stakeholders, and 91700 numbers of livestock. The altitudinal range is between 1300 and 3750m above sea level. There are several major majestic peaks of Mongol Altai and Khukh Serkh mountains stretch exceeds 3000m. G.Namkhajantsan et.al 2006 has characterized the local climate as continental harsh, semi-arid, and salty. Summer annual average air temperature is about 25<sup>0</sup>C, sand surface temperature is 45-60<sup>0</sup>C, annual precipitation is 72.6mm, and sunshine is 3103 hours/year.

Biger town is an important communication network centre because of the meeting point for accessing road from other southern towns to centre of Gobi-Altai city. 24% percent of the population is living in the town centre where residents work in the offices whilst most of the residents are involved in the pastoral herding industry in neighbouring centre and in the remote area, providing the main local employment and livelihoods for local economy.

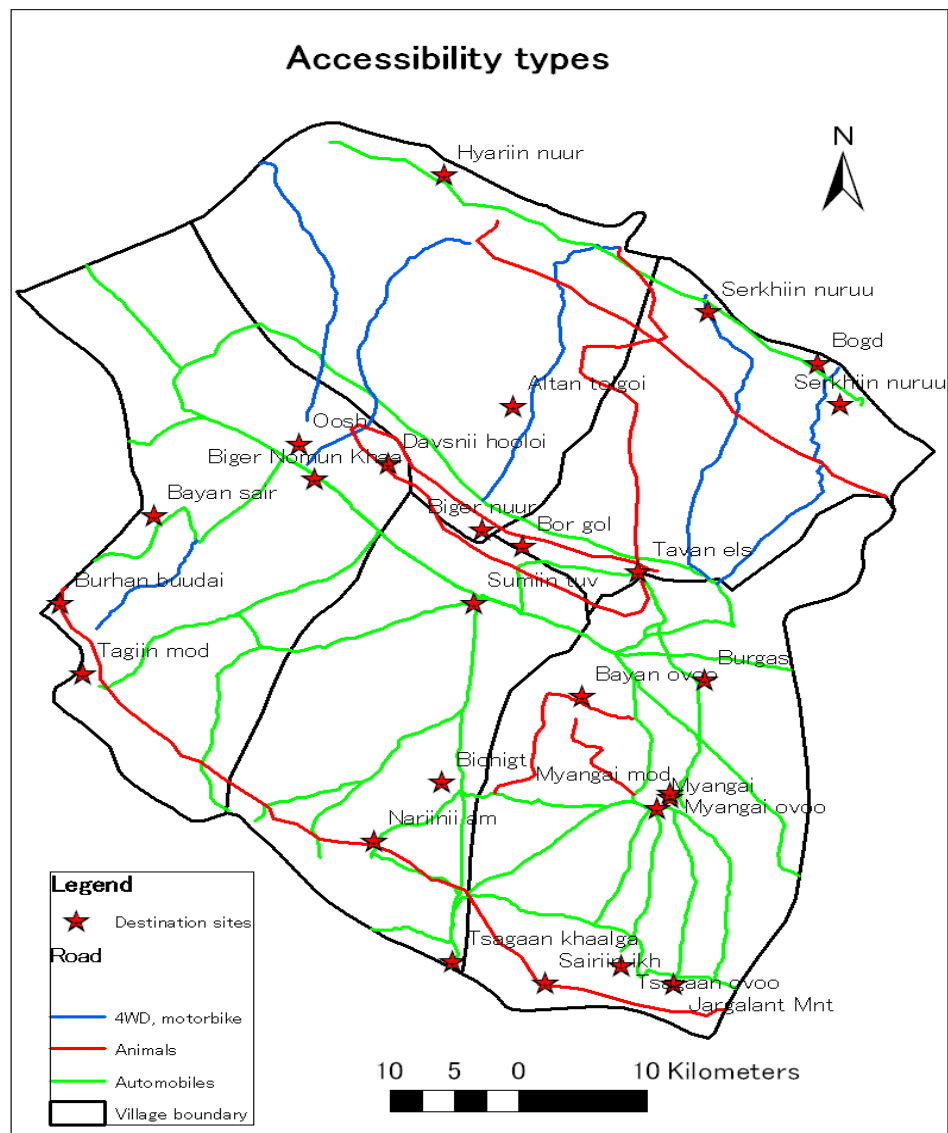
### **Overview of the methodology:**

The proposed methodology is based on theoretical principles of tourism planning, Geospatial techniques, role of all sectors, and field work experiences in the local area. The platform of Decision Support System with GIS and Participatory approach is the participatory design of the development plan using capabilities of Geo-spatial techniques and participation of local communities to help decision makers. The methodology process was divided into three optional steppes to develop the strategy of the ecotourism planning in the case area.

**1) Participatory mapping.** This step is mapped the all resources and destinations based on the thematic maps, remote sensing and GIS data sets, GPS data, locals' knowledge and ground truth measurements that conducted by researchers, Ecotourism Program developers and local householders.

**2) Participatory assessment.** This steppe is evaluation analysis on the actual local situation in related to ecotourism development, needs of tourism industry, analysis on resources classification, identifying alternative activities and imagining businesses, and as well as assessing impacts of

activities on the environment and economic benefits. It is made in the official discussion workshops and interviews with the evaluation group members including all sectors in the field area.



**3) Participatory planning.** The last step is to establish the steering committee that effectively represents all sectors to make clear the principles of policy, priorities, strategies, and actions for the potential tourism development and also to monitor the plan implementation and keeps the communication flow. The proposed development plan has been validated by the stakeholders and a local committee during the planning workshops formed to assure its implementation. Then steering committee should act as steward of the proposed strategy, ensuring that responsible organizations and providing the necessary pressure in order to stimulate the implementation of the actions.

#### Field survey:

The field work held on 8 July- 10 August, 2011 in study area that were validated carryout maps, collected the questionnaire on tourist interest, locals possibilities, treatment effects and did interviews with visitors, local residents, patients and governors. This year field survey was divided into two main parts of 1) Decision Support System for ecotourism planning and 2) effects of sanatorium treatment.

Communities' participation and tourists' satisfaction are the key determinant of future intentions for the ecotourism development to make decisions. Therefore, we conducted with visitors to hearing their opinions on tour management and their satisfaction on attraction through that improve and monitor the facilitation management to achieve the project program in the case point. Moreover we reintroduced the opportunity to local communities who want to participate in this industry for both tourism management planning and interpretation services. Interviews were conducted with a numbers of experts working in the provincial and local government who are related to ecotourism developer in the study area. We made face to face workshop between researchers (professors and assistants), and local governors, sanatorium proponents, doctors, patients, visitors and local settlements at the Five Sand sanatorium. The open discussion contains the sanatorium background and service quality, policy establishment for ecotourism services, available alternative activities for visitors, sanatorium and pastoral environmental conservation, and herd's livelihood improvement or locals' participation which connected with ecotourism development.

Figure 1. Accessibility types to the destinations in the case study of Biger city, Mongolia

### Expected results :

1. The first section of study could carry out the ecotourism management developments that including resources of attractions, accessibilities, human participation and needs, necessary infrastructure facilities and environmental degradations and also defined available alternative ecotour activities considering participation of communities. From this section we could found the needs of developments in the each of destination sites. GIS and Participatory approaches are very useful decision Support Systems. For example GIS analysis mapped and analyzed all resources potential spatially and quantitatively in the region and then participatory approach identified the all local situations, necessary items especially conducted with local residents and visitors. Due to results of approaches, decision makers have accepted the results and imagined the development needs and necessary facilities for the ecotourism development in the each of sites. Finally, the results of this section will publish in the volume 12(1) of ASEAN journal on Hospitality and Tourism entitled **Evaluation of Ecotourism resources through Participatory Geo-spatial approach: A case of the Biger City, Mongolia** by Balt Suvdantsetseg, Hiromichi Fukui, and Moriyuki Oe.
2. The other section was study on treatment effects at Tavan Els sanatorium. In 2011 our study further investigated the effects of sand sauna treatment based on some laboratory findings and technical measurements. In 2011 a total of 720 patients, 429 inpatients and 291 outpatients were treated at the facility. This study selected 150 patients with different symptoms of chronic glomerulonephritis; swelling (31%), blood in urine (9%), high blood pressure (over 130/80 mmHg; 10%), and mixed symptoms (50%). After the 10 days treatment, proteinuria had decreased in 52.6% of patients, blood in urine decreased in 16.6% of patients. Furthermore, hypertension decreased in 45% of patients by 10mmHg, 35% by 20mmHg, and 20% did not change. Swelling disappeared for 51% of patients and decreased for 45%, with 4% experiencing no change. 66% of patients experienced weight loss of between 2-4kg. The

result of this section will publish in the volume 75(2) of Journal of the Japanese association of Balneology, Climatology and Physical Medicine that entitled **Tavan Els Kidney Sanatorium in the Western Mongolia**, by Balt Suvdantsetseg et al.

### Research Achievements

1. B.Suvdantsetseg, H.Fukui, and R.Tsolmon “Ecotourism development planning in the Biger soum of Gobi-Altai province, Mongolia”, The 4<sup>th</sup> Annual International Conference on the Application and Development of Geospatial Technologies in Mongolia, p 153-158, June 21-23, 2010, Ulaanbaatar, Mongolia.
2. B.Suvdantsetseg, H.Fukui, and G.Purevdorj “Inventory of the soil properties for sanatorium treatment: Case study of Five Sand sanatorium, Mongolia”, Journal ONOSH of medical association of Mongolia, Vol 3 (47), p 19-23, 2010, Ulaanbaatar, Mongolia.
3. B. Suvdantsetseg, and H.Fukui “Geo-Informatics approaches for ecotourism planning; A case study for Gobi-Altai province, Mongolia”, The 10th Annual Association of Pacific Rim Universities Doctoral Students Conference, CD publication, Kyoto, Japan, 6-10 July 2009.
4. B. Suvdantsetseg, and H.Fukui "Detection of potential Ecotourism sites using remote sensing and GIS" Geo-information forum 2009 Japan, CD Geo09-09, Yokohama, Japan, 17-19 June 2009.
5. B. Myanganbayar, R.Tsolmon, R.Tateishi and B.Suvdantsetseg “Determination of desertification process and dynamic using Remote Sensing, Case study: Biger, Gobi-Altai province, Mongolia” Geo-information forum 2009 Japan, CD Geo09-04, Yokohama, Japan, 17-19 June 2009.
6. B.Suvdantsetseg, H.Fukui, and R.Tsolmon “Interoperable web based GIS services as decision making system for sharing environmental information: Case study in Gobi-Altai province, Mongolia” proceedings of 3<sup>rd</sup> International and National workshop “Applications of Geo-informatics for Mongolian Natural Resource and Environment”, June 29-30, 2009, Ulaanbaatar, Mongolia.
7. B. Suvdantsetseg, H.Fukui, and G.Purevdorj "Identification of the Soil Properties Using Spectral and Laboratory Analyses on Field Case Study of “Five Sand” Sanatorium, Mongolia" proceeding of 33rd International symposium on Remote Sensing of Environment, sustainable the Millennium Development Goals, Vol I & II, p1057-1060, Stresa, Italy, 4-8 May 2009.
8. B. Myanganbayar, R.Tsolmon and B.Suvdantsetseg, “Analysis of the changes in landscape and population growth of Ulaanbaatar city using remote sensing and GIS” the 4<sup>th</sup> International Student conference at Ibaraki University, CD-5, 1-2 Nov 2008, Hitachi City, Japan.
9. O.Munkhdulam, D.Enkhtaiwan, B.Suvdantsetseg, and H.Fukui “Identification of the Landscape and ecological expedient region using Satellite data and Ecosystem map” The 4th International Conference Natural Resources and Sustainable Development in Surrounding Regions of the Mongolian Plateau, 97-102p, 12-13 September 2008, Ulaanbaatar, Mongolia
10. B.Suvdantsetseg, H.Fukui, R.Tsolmon “Saxaul forest area determination by remote sensing in Mongolia’s Gobi region” The International Archives of the Photogrammetry, Remote Sensing

and Spatial Information Sciences.Vol. 37. Part B8. Beijing, 2-11 July 2008.

11. B.Suvdantsetseg, H.Fukui, R.Solongo, B.Khosbayar “Analysis of the changes in landscape and population growth of Ulaanbaatar city using remote sensing and GIS” 13<sup>th</sup> Inter–University conference on ASIAN MEGA-CITIES, CD-session 1-3, 11-13 march 2008,Quezon City, Philippines