3rd International Conference on

ETAR

BOOK OF CONFERENCE PROCEEDINGS

SEPTEMBER 26-27, 2016

3rd International Conference on
EMERGING TRENDS IN
ACADEMIC RESEARCH (3rd ETAR-2016)

*3rd International Conference on Emerging Trends In Academic Research
(ETAR-September, 26-27, 2016)

Global Illuminators, Kuala Lumpur, Malaysia.

ETAR 2016

Conference Proceeding

Book of Abstracts

3rd Internationl Conference on
Emerging Trends In Academic Research

Venue: Golden Tulip Galaxy Banjarmasin, Indonesia

Editor:
Dr Ahmad Saddam Ph.D.,
Country Director (Global Illuminators Iraq)

ISBN: 978-969-9948-60-2
Printed and Published by: Global Illuminators Malaysia

CONFERENCE PROGRAM

Welcome Reception & Registration

8:00 am –8:30 am

Opening Ceremony (08:30am – 10:15 am)

Venue: Room 1

08:30 am - 08:45am	Welcome Remarks - **Prof. Dr. Ir. H. Yudi Firmanul Arifin, M.SC -** Head of Organizing Committee ETAR 2016
08: 45am - 09:00am	Opening Speech - **Prof. Dr. H. Sutarto Hadi, M.Si, M.S -** Conference President and Rector of Lambung Mangkurat University (ULM) Banjarmasin, Indonesia
09: 00am - 09: 15am	Opening Speech – **Dr. Farooq Ahmad Jam-** Conference Chair ETAR-2016 & Executive Director Global Illuminators
09:15 am - 09:30am	Opening Speech - **Ibu Sina,S.Pi, M.Si -** City Mayor of Banjarmasin
09:30 am - 09:45am	Keynote Speech - **Prof. Dr. Ghazali Bin Sulong-** Faculty of Computing, Universiti of Technology Malaysia
09:45 am - 10:00am	Keynote Speech - **Dr. Jay P. Sah -** Research Faculty at the Southeast Environmental Research Center, Florida International University, USA

DAY 01 Monday (September 26, 2016)
Session 1 (11:15 am – 01:00 pm)
Venue: Room 1
Session Chairs: Chairil Faif Pasani & Ghazali Bin Sulong
Track: Social Sciences and Humanities

ETAR-16-109	Analysis of Urban Conflict Networks: Theoretical and Methodological Perspectives	Catherine Trudelle
ETAR-16-110	Siyakhulisa is an Early Childhood Development (ECD) Intervention Project Aimed at Improving The Knowledge and Skills of Early Childhood Development Practitioners in Townships in South Africa.	Elsa Fourie
ETAR-16-125	Toward Elderly friendly place making: Concepts and Steps	Bhezadfar Mostafa
ETRA-16-132	Learning Barrier and Learning Motivation of Nursing Students in Poltekkes Banjarmasin	Hammad Martapura
ETAR-16-138	Management Profile of Traditional Craft in City-based Region and Craft Management in Farm-based Region	Slamet Subiyantoro
ETAR-16-143	Lower Secondary School Student's Written Mathematical Communication based on Gender	Noor Fajriah
ETAR-16-150	The Urgency of Local Act Draft on Corporate Social Responsibility (CSR) in Way Kanan	Charlyna S. Purba
ETAR-16-154	Development Module Physics on Subject Matter Temperature and Heat Integration Local Wisdom in Making Coconut Oil	Mustika Wati, Misbah
ETAR-16-155	The Meaning of Trade for the Dayak Ethnic People of South Barito Central Kalimantan (An Analysis in the Adaptation Trading Style Communication and the Usage of Verbal Language)	Novaria Maulina

Lunch Break (01:00 pm – 2:00 pm)

DAY 01 Monday (September 26, 2016)
Session 3 (03:30 pm – 04:45 pm)
Venue: Room 3
Session Chairs: Vivi Andasari & Jay P. Sah
Track: Engineering and Technology Studies

ETAR-16-167	Estimation Erosion Based Geographic Information SystemFor Rating Characteristics Watershed Tabunio in the District of Tanah Laut	Syarifuddin Kadir
ETAR-16-169	Land cover Changes Through Geographic Information Systems in Order to carrying capacity Determine Satui Watershed South Kalimantan Province	Badaruddin or Karta Sirang
ETAR-16-174	Evaluation of Tidal and Channel Geometry Effects to Dissolved Iron Accumulation Pattern In Terantang Reclamation Channel	Riduan, Rony
ETAR-16-180	The Effectiveness of Charcoal Powder Size in Biogas Purification	Achmad Kusairi Samlawi
ETAR-16-181	Utilization of Fly Ash, Palm-Pressed Fibers, and Empty Fruit Bunches of Oil Palm in Lightweight Concrete	Yulian Firmana Arifin
ETAR-16-192	Irrigation Requirement and Water Availability Analysis for Jejangkit Ii Area	Maya Amalia

Tea Break: (04:45 pm to 05:00 pm)

Available online at www.globalilluminators.org

GlobalIlluminators

FULL PAPER PROCEEDING
Multidisciplinary Studies for Engineering and Technology Studies

Full Paper Proceeding ETAR-2016, Vol. 3, 252-257

ISBN: 978-969-9948-63-3

ETAR 2016

Estimation Erosion Based Geographic Information System for Rating Characteristics Watershed Tabunio in the District of Tanah Laut

Syarifuddin Kadir[1*], Badaruddin[2], Nurlina[3], dan Eka Farma[4]

[1,2,3,4] University of Lambung Mangkura, South Kalimantan, Indonesia

Abstract

Watershed Tabunio is one of the watershed in Tanah Laut District which has an important role to support the environmental aspects and socio-economic aspects, it is caused by the upstream part of the watershed there are different types of land use can increase the rate of erosion, the flow surface , Also on the middle and downstream utilized by the Tanah Laut for agriculture, plantation and fisheries.
This study aims to determine the level of erosion, which is useful as a reference for determining the direction of land use for watershed restoration efforts Tabunio. This research method using a regional approach ecological watershed analysis process and presentation done spatially through Geographic Information Systems. The results showed that: a) Amount highest erosion 219,08ton / ha / yr on land unit (LU) 3B (mining land use with a gradient of 3-8%), while the lowest amount of erosion 11,44ton / ha / yr on UL 8 (use of secondary dry forest with slopes 25-40%); b) The level of erosion is very light danger land unit (LU) 8 on the use of secondary dry forest on the slope of 25 40%), while other land units at the rate of moderate to severe erosion hazard.

Keywords: Erosion, Watershed, Geographic Information Systems

Introduction

Characteristics of the watershed is a parameter determining the vulnerability of flood prone. Tanah Laut including Watershed Tabunio in the period 2007 to 2010 looks increasingly risen to 22 villages (Agency for Research and Development, 2010). Critical land in the watershed is Tabunio area of 19109.89 ha or 31% of the watershed (Watershed Management Institute Barito 2013). The population of the watershed is increasing and requires Tabunio land resources to improve the welfare of society. Damage to the environment has become a concern of many parties, due to the increased perceived natural disasters, such as floods, landslides and drought. Accordingly, necessary to study the level of erosion hazard characteristic part of the watershed is the reference watershed restoration.

This study aims to determine the level of erosion hazard to vote Watershed characteristics Tabunio. Benefits of this experiment diharpkan be the basis of determining the direction of land use for watershed restoration efforts Tabunio

Method

The study was conducted in the watershed Tabunio which is administratively located in the district of Tanah Laut South Kalimantan. The experiment was conducted in 2015 through 2016. Tabunio DAS consists of three sections as shown in Table 1, while the map of the location of the research presented in Figure 1

*All correspondence related to this article should be directed to Syarifuddin Kadir, University of Lambung Mangkurat, Banjarmasin, South Kalimantan, Indonesia
Email: odeng1987@yahoo.com

Table 1

Sub Watershed DAS Tabunio

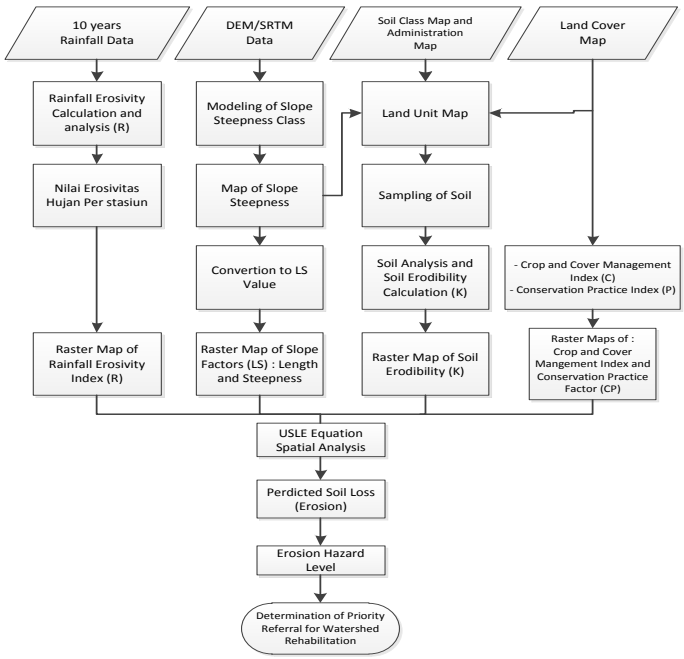
No	Bagian DAS	Subzone	Village	Large
1.	Upstream	1)Tebing Siring; 2)Amparo Kecil; 3) Riam	Tebing Siring; Tanjung; Sungaibakar; Martadah	17,542.82
2	Middle	1)Berasau; 2)Bakar; 3)Atu-atu; 4) Kandangan	Pabahanan; Bajuin; Atu-atu; Ketapang; Kunyit; Angsau; Galam; Tirtajaya; Pamalongan; Pantailinuh; Tampang; Gunungmelati; Saranghalang	13,038.44
3	Downstream	1) Panjaratan; 2) Tungkaran; 3) Takisung	Sungaijelai; Ambungan; Panggung; Pelaihari; Panjaratan; Ujung batu; Panggungbaru; Tugkaran; Tabanio; Pegatan besar; Guntung besar; Ranggang; Ranggang dalam; Takisung; Gunung makmur; Benualawas; Benuatengah; Batilai; Telaga	31,978.30
Total				62,559.56

Tools and Materials Research

Tools and materials research consists of: a) A set of Computers; b) Software gegrafi information system ArcGIS); c) Global Position System (GPS); d) Handhel; e) Digital Cameras; f) Ring Samples; g) Drill Land. A necessary ingredient in this study are: a) Map Tanah Laut regency administration; b) map Tabunio basin; c) Map of soil types, Tanah Laut District; d) The land cover map Tanah Laut; e) Data Digital Elevation Model (DEM) of 30x30 m pixel Tanah Laut; f) Data rainfall and number of days of rain the last 10 years.

Analysis

This study uses a watershed approach ecological area using Universal Soil Loss Equation (USLE) method, process analysis and presentation done spatially through Geographic Information Systems (GIS). The process flow diagram for estimating erosion watershed characteristics Tabunio votes in Tanah Laut is presented in Figure 2.



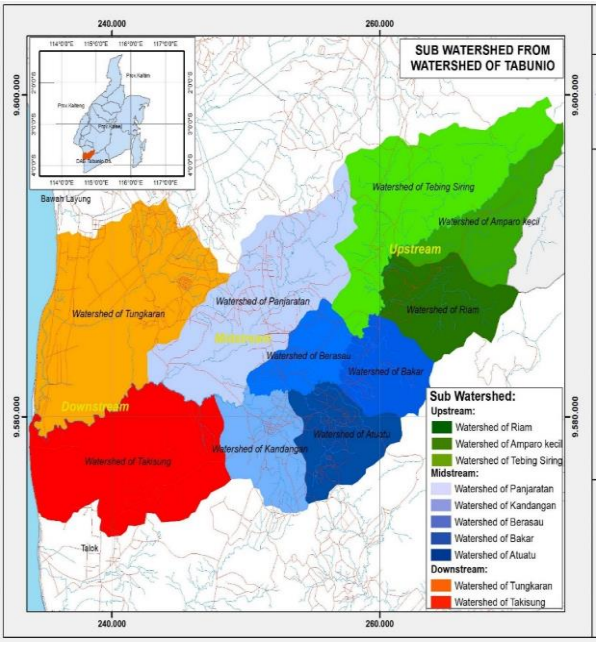


Figure 1. Process Flow Diagram Figure Characteristics Rating Watershed Tabunio

2. Erosion Prediction Research Location Map

Results and Discussion

Based on research conducted in the watershed Tabunio, the information obtained watershed characteristics consisting of: a) the land unit: b) the value of erosion; c) Erosion Hazard rate as a factor in watershed characteristics votes.

Land Unit

Results overlay unit soil maps, land cover and slope, then acquired the land unit as the unit of analysis. The number of units of land are presented in Table 2.

Table 2

Total Land Area Research Unit

No	Land unit	Area (Ha)	Land Cover	Soil Map units	Slope (%)
1	UL 1a	1.474	Amalgamated plantations	Dystrudepts	0 - 3%
	UL 1b	3.327	Shrubs and thickets		
2	UL 2a	7.215	Plantation	Endoaquepts (sulfic)	0 - 3%
	UL 2b	4.924	Shrubs and Thicket Swamp		
3	UL 3a	6.859	Plants Mixed	Hapludox	3 - 8%
	UL 3b	2.102	Mining		
4	UL 4a	3.509	Amalgamated plantations	Kandiudults	3 - 8%
	UL 4b	2.407	Shrubs and thickets		
5	UL 5a	8.736	Plantation	Kanhapluduts (skel)	3 - 8%
	UL 5b	3.274	Plantation		
6	UL 6a	2.450	Dryland Mixed Farming	Kanhapluduts	3 - 8%
	UL 6b	2.904	Shrubs and thickets		
7	UL 7a	2.599	Plantation	Kandiudox	8 - 15%
	UL 7b	5.393	Shrubs and thickets		
8	UL 8	5.389	Dryland Forests Secondary	Inceptisols	25 - 40%

Source: The results of primary data in 2015

Table 2 shows that the overlay of the land unit made up of 15 units, then it appears that the largest land unit UL 3a. 6,859 ha on land use mix plants with a slope of 3-8%, while the smallest land units UL 1a. 1,474 ha in plantation land use mix with slopes 0-3%. Land unit is the smallest unit in watershed management, based on the characteristics of the land unit can be a reference or recovery efforts and maintain it.

Zhang et al. (2008) suggested that the unit of land in a watershed is generally regarded as a development unit which rely on the availability of water. Hernandez-Ramirez, (2008) suggested that the planning of land use and management using the watershed as the management unit. In addition Soemarno (2011) unit of land in the watershed can be used as a means of monitoring the land use either as a unified ecosystem.

Total Erosion

Results of analysis for determining the amount of erosion using USLE equation, the obtained amount of erosion per unit of land as presented in Table 3.

Table 3

Total Erosion on Each Unit of Land in the Watershed Tabunio

No	Land unit	Area (ha)	(R)	(K)	LS	(C)	(P)	A
1	UL 1A	1.474	1579	0,153	0,35	0,6	1	50,88
	UL 1B	3.327	1579	0,124	0,35	0,4	1	27,16
2	UL 2A	7.215	1579	0,104	0,35	0,5	1	28,55
	UL 2B	4.924	1579	0,142	0,35	0,02	1	1,55
3	UL 3A	6.859	1579	0,147	0,82	0,1	1	19,07
	UL 3B	2.102	1579	0,169	0,82	1	1	219,08
4	UL 4A	3.509	1579	0,111	0,82	0,5	1	71,49
	UL 4B	2.407	1579	0,133	1,06	0,4	1	89,11
5	UL 5A	8.736	1579	0,210	0,82	0,5	1	136,11
	UL 5B	3.274	1579	0,059	1,10	0,6	1	61,93
6	UL 6A	2.450	1579	0,093	1,57	0,45	0,35	36,35
	UL 6B	2.904	1579	0,096	1,37	0,1	1	20,87
7	UL 7A	2.599	1579	0,124	2,65	0,6	0,35	108,80
	UL 7B	5.393	1579	0,093	2,65	0,5	0,6	116,34
8	UL 8	5.389	1579	0,100	14,54	0,005	1	11,44

Source: The results of primary data in 2015.

Description: A = Number of erosion (tonnes / ha / yr), R = Value erosivitas, K = Value erodibiltas, LS = The length and slope, land cover C = Value, P = Value conservation measures.

In Table 3 shows that the highest amount of erosion 219.08 tonnes / ha / yr on land unit 3B (mining land use with slopes 3-8%), while the lowest value of normal erosion consideration of land cover on land units UL 8 sebesar11,44 ton / ha / yr on dry land forest land use secondary with gradients of 25-40%. Changes in land use into mining activities often reduce infiltration and otherwise improve runoff and erosion, so that the necessary consideration and planning of land use changes.

Steel (2012) stated that in land use planning and the selection of the type of land use, determining the optimal spatial location of the planned activities, should identify and formulate opportunities for land use changes, and anticipate the consequences of land use changes. Zhao et al. (2012) reported that the demolition of land cover in a watershed effect on runoff and soil erosion.

Changes in land use have a negative impact on environment (Kasereka, 2010) Asdak (2010), the amount of water that goes into the ground through the infiltration process is influenced by several factors, among others, the texture and structure of soil and land cover, these factors interact to affect infiltration and runoff and erosion.

Aspects of the slope proved to have a major impact on the rate of soil erosion, and the slopes exposed to the sun appeared to have a greater erosion than the shaded slopes, especially for agricultural land (Li et al., 2010)

Erosion Hazard Level

Arsyad (2010), the movement of soil erosion is an event or portions of land from one place to another by natural media. Furthermore, according to Yu (2003), the low capacity of infiltration causes heavy erosion as a result of high runoff. Based on the value erosion in Table 2, it can be determined the level of erosion per unit of land by considering the depth of solum.

In Table 3 shows that the rate of erosion in the watershed Tabuni consists of; a) 5 klasfikasi land unit weight; b) 5 units of land classification being; c) 2 units of land classification of light; and d) 2 unit is very light land classification. Unit lands with severe erosion hazard level classification is dominated by mining land cover, shrubs and plantations solum into the mixture at 60-90 cm.

Erosion hazard level classification is determined by the physical properties of the soil and its closure and soil solum. Is shown in Table 3 that land mines (UL3B) including severe erosion hazard level classification it is because of the high sensitivity of soil eroded fatherly (UL3B in Table 3). According Arsyad (2010), soil properties that affect sensitivity to erosion.

Sajikumar and Remya (2015) evaluated the effects of land use and land cover on runoff-surface characteristics of the two watersheds in Kerala, India. Furthermore Zhang, et al. (2015), the land of former opencast coal mine in Shanxi province may increase the rate of erosion. Mainuri and Owino (2014) study the relationship between landscape and land use, soil degradation. Solum is one of the characteristics of the soil in a watershed that could affect the infiltration, runoff and erosion. Kadir et al. (2013) reported that the rehabilitation of mined lands through vegetative and mechanical is one of the best alternatives to control the level of vulnerability to flooding and erosion.

Differences in soil depth and soil permeability, together with differences in vegetation cover, can determine differences in surface runoff processes that occur at each location, and explains the differences in the characteristics hidrografnya (Lana-Renault, et al., 2011). Furthermore Kadir et al. (2016), the enrichment of vegetation types based on the suitability of land in the watershed Tabunio is one of a watershed restoration efforts.

Table 3

Value Erosion Hazard Level for Each Unit of Land in the Watershed Tabunio

No	Land unit	Area (ha)	Depth		Erosion hazard		Erosion Hazard Level
			(cm)	Class	ton/ha/thn	Kelas	
1	UL 1A	1.474	> 90	Deep	50,88	II	Light
	UL 1B	3.327	60 – 90	Moderate	27,16	II	Moderate
2	UL 2A	7.215	> 90	Deep	28,55	II	Light
	UL 2B	4.924	> 90	Deep	1,55	I	Very light
3	UL 3A	6.859	> 90	Deep	19,07	II	Light
	UL 3B	2.102	> 90	Deep	219,08	IV	Heavy
4	UL 4A	3.509	60 – 90	Moderate	71,49	III	Heavy
	UL 4B	2.407	60 – 90	Moderate	89,11	III	Heavy
5	UL 5A	8.736	60 – 90	Moderate	136,11	III	Heavy
	UL 5B	3.274	60 – 90	Moderate	61,93	III	Heavy
6	UL 6A	2.450	60 – 90	Moderate	36,35	II	Moderate
	UL 6B	2.904	60 – 90	Moderate	20,87	II	Moderate
7	UL 7A	2.599	> 90	Deep	108,80	III	Moderate
	UL 7B	5.393	> 90	Deep	116,34	III	Moderate
8	UL 8	5.389	> 90	Deep	11,44	I	Very light

Source: The results of primary data in 2015

Tabel 4.

Priority Locations and Tutorial forest and forest rehabilitation Watershed Tabunio

No	Land unit	Land cover	TBE	Arah Rehabilitasi	Area (ha)
1	UL_2a	Plantation	Heavy	Traditional terrasering	32,05
2	UL_3b	Mining	Heavy	Rehabilitation dan Traditional terrasering	13,86
3	UL_5a	Plantation	Heavy	Traditional terrasering	9,35
Total					55,26

Source: The Results of Primary Data in 2015.

Conclusion

Based on the results of research and discussion, we can conclude:

1. Arab land overlay of soil type, land cover and slope of the land consists of 8 units (1A-B, 2A-B, 3A-B, 4A-B, 5A-B,6A-B, 7A-B and 8 land unit).
2. The amount of the highest erosion 219.08 tonnes / ha / yr on Land Unit 3B (mining land use with a gradient of 3-8%), while the lowest amount of erosion of 11.44 tonnes / ha / yr on Land Unit 8 (use of dry-land forests secondary with gradients of 25-40%);
3. Danger Level moderate to severe erosion on land units 1 to 7, while the land unit 8 at the rate of erosion is very light.
4. Characteristics of erosion potential of moderate to severe land rehabilitation needs to be done in the form of a mechanical approach of making traditional patio (terrace garden) and drain the water.

References

Arsyad, S. 2010. Soil and Water Conservation, the First Edition. IPB Press. Bogor.

Asdak. 2010. Hydrology and Watershed Management. Prints Fifth (revised) Gadjah Mada University Press. Yogyakarta.

Research and Development Agency of South Kalimantan Province and the Faculty of Forestry Unlam. Masterplan 2010. Floods and Their Management in South Kalimantan, Banjarmasin.

Baja,S. 2012. Analytical methods of evaluation of land resources. GIS applications, fuzzy set, dan MCDM, Identitas Universitas Hasanuddin, Makassar.

Hernandez-Ramirez, G. 2008. Emerging Markets for Ecosystem Services: A Case Study of the Panama Canal Watershed. Journal of Environment Quality. 37

Kadir, S., Rayes, M. L., Ruslan, M., and Kusuma, Z. 2013. Infiltration To Control Flood Vulnerability A Case Study of Rubber Plantation of Dayak Deah Community in Negara, Academic Research International. Natural and Applied Sciences. 4 (5):1–13. http://www.savap.org.pk.

Kadir, Badaruddin Nurlina dan Fonnyi Rianawaty. The recovery of Tabunio Watershed through enrichment planting using ecologically and economically valuable species in South Kalimantan, Indonesia. Biodiversitas ISSN: 1412-033X Volume 17, Number 1, April 2016

Lana-Renault,N., J. Latron, D. Karssenberg, P. Serrano-Muela, D. Regüés dan M.F.P. Bierkens. 2011. Differences in stream flow in relation to changes in land cover: A comparative study in two sub-Mediterranean mountain catchments. Journal of Hydrology, 411(3–4): 366-378.

Mainuri,Z.G. dan J.O.Owino. 2013. Effects of land use and management on aggregate stability and hydraulic conductivity of soils within River Njoro Watershed in Kenya. International Soil and Water Conservation Research, 1(2): 80-87.

Sajikumar,N. dan R.S. Remya. 2015. Impact of land cover and land use change on runoff characteristics. Journal of Environmental Management, In Press, Corrected Proof, Available online 7 January 2015

Soemarno. 2008. Pemodelan Sistem dalam Pengelolaan Sumberdaya Alam dan Lingkungan. Program Pasca Sarjana, Unviversitas Brawijaya, Malang

Yu, J., Lei, T., Shainberg, I., Mamedov, A. I., and Levy, G. J. (2003). Infiltratin and Erosion in Soils Treated With Dry Pam and Gypsum. Soil Science Society of America Journal. 67 (2): 630-636.

Zhang, X., Yu, X., Wu, S., and Cao, W. 2008. Effects of Changes In Land Use and Land Cover on Sediment Discharge of Runoff In A Typical Watershed In the Hill and Gully Loess Region of Northwest China. Frontiers of Forestry in China. 3 (3): 334–341. doi:10.1007/s11461-008-0056-1.

Zhao, Y., Zhang, K., Fu, Y., and Zhang, H. 2012. Examining Land-Use/Land-Cover Change in the Lake Dianchi Watershed of the Yunnan-Guizhou Plateau of Southwest China with remote sensing and GIS techniques: 1974–2008. International Journal of environmental research and public health. 9 (11): 3843–65. doi:10.3390/ijerph9113843.