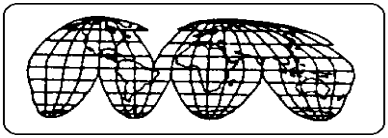

International Geographical Union
STUDY GROUP ON LAND USE/COVER CHANGE

NEWSLETTER

No 4 December 1999

PROGRESS OF IGU-LUCC

1999 was a year of consolidation for the Study Group. There have been meetings, networking, joining of new members, improvement of the Group's website, and so on. The Group is proud of the facts that it has been supported by a number of young researchers, as well as more senior specialists, and that it has been represented by as many as 40 countries/regions. The age and regional balances of the Group are not only important for a global environmental project with human dimensions, such as ours, but also relevant for the International Geographical Congress that carries the banner of 'Living with Diversity'. In August 2000, there will be the 29th IGC in Seoul, and the Group is planning pre- and post-congress meetings and excursions, as well as paper/poster sessions during the main congress. It will also be a crucial year for the Group's plan to publish a pilot atlas on land use/cover changes in selected regions in the world. Let's make them all succeed.

Meetings:

- Special Session for IGU-LUCC in NIES Workshop on Information Bases and Modelling for LUCC Studies in East Asia; Tsukuba, Japan; January 27, 1999, 15 participants, 7 countries; organised by Prof. Y. Himiyama.
- Symposium – Land Use/Cover Change; Honolulu, U.S.A.; July 10-13, 1999; 30 participants, 12 countries; organised by Dr. J. Fox, East-West Centre.

Publications:

- Proceedings of IGU-LUCC'98 Symposium (December 1999)
  contact: Prof. A. Firmino, New University of Lisbon, E-mail: am.firmino@ip.pt
- Proceedings of IGU-LUCC'99 Symposium (to be published in spring 2000)
  contact: Dr. R. B. Singh, University of Delhi, E-mail: singhrb@ndf.usnl.net.in

New Website: The Group's website is now at http://www.csis.u-tokyo.ac.jp/igulucc/

Activities related to the 29th International Geographical Congress

- Pre-congress meetings: Japan-Korea; August 7-13; Local Organisers - Prof. Y. Himiyama, Dr T Inchinose (both Japan) and Prof. M. Hwang (Korea); Main Theme - Land Use/Cover Changes in Comparative Perspective. The meetings include study tours and paper sessions. It consists of Part I (Japan) and Part II (Korea).
- Main Congress session: Land Use and Land Cover Change – The Contribution of Geography (T-1-s2*). During the Main Congress, general and poster sessions will be held. The poster session is mainly intended to contribute to the atlas mentioned below. National/regional-level contributions are particularly desired.
- Post-congress study tours: China; Local Organiser – Prof. Lu Qi (China); Tour I in Beijing and Inner Mongolia: August 19-24; Main Theme - Urbanisation and Land Degradation; Tour II in Xinjiang: August 26 - September 5; Main Theme - Land Use and Land Cover Changes in Historical Perspective.

Please see page 8 for further details.

Guidelines for a national/regional contribution to the atlas

Those who wish to contribute a national/regional report to the atlas are encouraged to present their work in the Group's session in the main congress. They are requested to take account of the outline of the proposed pilot atlas, as shown below, when they prepare a poster for the Group's poster session.

1. The atlas will be A3 in size, in vertical position, with about 200 pages.
2. The length of each contribution will be about 6 to 12 pages, with half of them for major maps, and the rest for other maps, tables and text.
3. Major maps should be ideally in colour.
4. Study area can be a region as well as a country, but it should not be too small.
5. Time range can be between 50 and 300 years.
6. The contents include description of data, method, basic facts, processes, driving forces and mechanisms of changes, models of changes, effects of changes, problems of changes, future prospects, etc.
7. There is no common scale for maps.
8. The types of major map include grid map, statistical map, conventional land use map, landscape map, etc.
9. The contribution should be useful for international comparisons, and should aim not only at specialists, but also at students, etc.

Yukio Himiyama, Chair of IGU-LUCC

The dynamics of land-use and land-cover change differ in different parts of the world. In much of Europe, land is being released from agriculture, and is reverting to scrub and (eventually) to forest. In many parts of Africa, Asia and Latin America, the agricultural area continues to expand. The two short papers that follow reflect some of the trends and concerns that characterise these contrasting parts of the world.

Land use changes in Gorenjska, Slovenia

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Land use reflects a complex correlation between natural, historical, and socio-economic factors. The latter are among first to single out in Gorenjska in the last century. The abandonment of agricultural production and reversion of land are the most evident indicators of cultural landscape dissolution. The proportion of cultivated fields, meadows, and pastures constantly decreases and the proportion of land in the process of being overgrown therefore increases, which later results in a higher proportion of forest. Slovenia ranks among the most-forested countries in the world Gorenjska is among the first to single out, especially since almost 10 percent of it lies above the tree line. This article presents land use in Gorenjska, in north-west Slovenia lying in the corner between Austria on the north and Italy on the west. Gorenjska is an alpine landscape with rocky mountains and forested hills dissected by glacio-fluvial valleys and basins accumulated by sediments.

The cadastral municipality of Gorenjska, one of the most forested despite having 10 per cent of its land area above the treeline, was selected as the basic unit for study. It has been a relatively stable territorial unit for almost two centuries since the introduction of the Emperor Francis' cadastre. The data in the land cadastre differ from the actual situation due to inconsistent monitoring and recording of the changes. For this reason, the data deriving from agro-maps that cover the whole territory of Slovenia at scales of 1:5000 were taken into consideration as well. Agro-maps, made and adjusted for agricultural purposes, are based upon aerial photographs taken between 1987 and 1991. This analysis deals with five land categories: cultivated fields, meadows and pastures, reverting land, forests, and unproductive land. The cadastre distinguished cultivated fields and gardens, meadows, vineyards, pastures, forests, orchards, vineyards, swamps and marshes, unproductive land. But the agro-map considers only agricultural land (cultivated fields, meadows, orchards, vineyards, reverting land).

The proportion of agricultural land in Gorenjska has diminished constantly since the beginning of this century, and on the other hand the proportion of forest and unproductive land has increased. The comparison of the land categories according to the cadastre between 1901 and 1994 shows that the proportion of cultivated fields decreased from 14.6 % to 8.1 %.

Table 1: Changes of land use in Gorenjska between 1901 and 1994

Year	Cultivated fields (%)	Meadows and pastures (%)	Agricultural land (%)	Forest (%)	Unproductive land (%)
1901 C	14.6	26.9	41.5	49.0	9.5
1938 C	12.4	26.6	40.1	50.5	9.4
1961 C	10.6	24.5	36.4	53.0	10.6
1994 C	8.1	21.7	31.2	56.7	12.1
1991 A	6.0	13.4	28.2	-	-

C cadastre A agro-map

The proportion of meadows and pastures decreased by one-fifth, the proportion of agricultural land altogether by one-quarter. The proportion of forests increased by one-sixth, from 49.0 % to 56.7 %: in Slovenia in the same period forests expanded from 42 to 48 %. However, according to estimates forests already cover almost 60 % of Slovenia and almost two-thirds of Gorenjska. Differences between the official data and estimates of foresters show the obvious discrepancy between the cadastre and the actual situation. At the beginning of the century, unproductive land covered 9.5 % of Slovenia, and in less than 100 years its proportion rose to 12.2 %. This increase is largely due to expansion of the built-up area.

According to the 1991 agro-map, cultivated fields extended to only 6.0 % of the municipality's area, which is one-quarter less than the cadastral figure for 1994. The greatest difference between data, deriving from different sources, is for meadows and pastures. According to the agro-map, the proportion of meadows and pastures was 13.4 %, which was one-third less than the cadastral figure for 1994. This is because the agro-map records agricultural land in the process of being overgrown (i.e. 'reverting'), as a special land category. The proportion of land in the process of being overgrown was 7.8 % in Gorenjska. The proportion of all agricultural land (cultivable fields, meadows, pastures, orchards, and the land in the process of being overgrown) according to agro-map was 28.2 %, which was one-third less than at the beginning of the century.

The map of prevailing land use according to cadastral municipalities was made on the basis of the agro-map. Forests comprise the dominant land category in most of the cadastral municipalities. Unproductive land prevails in cadastral municipalities that stretch over high mountains and in those that are densely populated. In most of the cadastral municipalities, meadows and pastures comprise the dominant land category. Most of these cadastral municipalities are in the highlands and in some high mountainous areas as well as in diverse conglomerate terraces of the basins. Cultivated fields prevail only in cadastral municipalities on gravel plains, while the 'reverting' land occurs mostly in the Julian Alps.

Agricultural institute of Slovenia (1992) *Agro - map*. Ljubljana
Gabrovec M., Kladnik D. (1997) Some new aspects of land use in Slovenia, *Acta Geographica* 37, Ljubljana
Gemeinde Lexikon für Krain (1905) Vienna, 1905
DZS (1998) Geografski atlas Slovenije, Ljubljana
Surveying and Mapping Authority of the Republic of Slovenia (1961 and 1994) *Land cadaster data on land categories according to cadastral municipality.* Ljubljana
Ministry of Agriculture (1940) *Agricultural annual statistics 1939*. Belgrade
Ministry of Forestry (1940) *Statistics of forests 1938*. Belgrade

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Can China Feed Itself?
An integrated analysis of China's food prospects on a CD-ROM

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China's food prospects have been the subject of serious political concerns. Today, China faces the challenge of feeding its 22 percent share of the global population on only some 9 percent of the world's arable land. Recent projections assume that the population will increase by another 260 million people during the next 25 years. A food crisis in China could threaten political stability. The country's increasing food import demand might also destabilise world grain markets.

This analysis brings together new data, arguments, and in-depth analyses that show that China's farmers will be able to feed the projected population of 1.48 billion by 2025 only if certain policy measures are taken now. Previous research has primarily focused on the availability of agricultural resources. This study, however, shows that the scarcity of water and land are just two factors in a multi-term equation that also includes demographic, economic, social, cultural, and political elements. One important result of this study is that previous publications have seriously *under*estimated China's cultivated land area. Based on recent data from agricultural surveys we found that China's cropland area is in the range of 132 million hectares – which is some 40% *larger* than the 'official' cropland area still published in the *China Statistical Yearbook.* If this estimate is correct, we must assume that China's agricultural productivity is much *lower* than previous studies (such as the analysis of Lester Brown) have found. This is *good* news for China's food prospects. China's farmers have not reached the maximum attainable crop yields – they still can significantly improve productivity.

Based on IIASA's Agro-ecological Zones Model (AEZ) we also found that China has some cropland reserves in the range of 30 million hectares – primarily in the North and Northeast. About 15 million hectares of this reserve could be cultivated under rain-fed conditions - the rest would require irrigation. Unfortunately, these cropland reserves are primarily located in remote areas, so that considerable investment into infrastructure would be necessary.

We also analysed the decline of China's cropland area since 1988. Contrary to widely published arguments we found that most of the decline is *not* due to degradation or infrastructure expansion. Data from China's State Land Administration indicate that most of the cropland decline is a result of agricultural *conversion*. Farmers converted cropland areas into horticulture land and fishponds or used it for reforestation. This clearly is as a sign of greater market orientation, as farmers responded to the increasing consumer demand for vegetables, fruits and animal protein.

Water – *not* land – is the most critical natural resource for China's agriculture. The extreme water deficit in the North is causing serious water-related production problems in the northern part of the North China plain and the semi-arid border regions of North-central China. Unfortunately, China's agriculture is not only affected by a deficit of water, but also by its opposite. Some agricultural areas – particularly along the Yangtse and Yellow River – are frequently devastated by massive floods. Flooding is a major risk factor for China's food security. More cropland is lost due to flooding than due to infrastructure expansion and urbanisation. It is also a risk factor with political and economic dimensions, because dams and dykes are often poorly maintained and inadequately upgraded.

This study emphasises the demographic, social, economic and political dimensions of China's food security. It includes modelling results on the impact of diet change (primarily the increase in meat consumption), population growth and urbanisation on food demand. With a massive increase in urban population, China must quickly build up its food industry and food logistics. More and more people do not live from their own land, but have to be supplied over a long food chain.

In conclusion, this study gives a more optimistic outlook for China's food prospects than those doomsday scenarios published in recent years. In particular we found that the resource situation is *not* as critical as previously thought. However, this is no guarantee for glorious food prospects. As China's (recent) history – in particular during the 'Great Leap Forward' – has shown bad (economic) policy can ruin everything. This study identifies those political measures, which are critical for improving China's food security in the 21st century.

More details about the study and the CD-ROM are available at IIASA's ChinaFood Web site at: http://www.iiasa.ac.uk/Research/LUC/ChinaFood/

IGU-LUCC Tours/Meetings Schedule (tentative, as of 2 December 1999)

1. Pre-Congress Meeting/Tour Part I in Japan (August 7-11)

Aug 7 starting at Downtown Tokyo / to visit Tokyo Bay reclamation area, and to stay in Tsukuba Academic City

8 paper session in the morning / to observe Tokyo rurban fringe, and to stay in Downtown Tokyo

9 morning flight from Tokyo to Asahikawa / to observe urban and agricultural development in Asahikawa and Biei (known as a town of hills) / to visit Hokkaido Map Co. Ltd. (a major map company in Japan)

10 paper session in the morning / to visit 'Canadian World' (a theme park) and Kitanihon Seiki Co. Ltd. (a high-tech industry) in Ashibetsu, a former mining town.

11 bus from Asahikawa to Chitose via Sapporo / a short visit to Downtown Sapporo /afternoon flight from Chitose to Seoul

2. Pre-Congress Meeting/Tour Part II in Korea (August 11-13)

Aug. 11 arrival in Seoul

12 New international airport and new town on reclaimed land

13 Visit to De-militarised Zone (reversion towards wilderness: no land use)

Cost: Part I in Japan: US $450 and extra US $135 for single room

Part II in Korea: US $250 and extra US $100 for single room

Both Part I and Part II includes accommodation, meals and local transportation. The air fare from Tokyo to Asahikawa is included, but not the air fare from Sapporo to Seoul.

3. Group Session during the Main Congress

Schedule is not issued yet from the Congress Secretariat. Those who wish to use the same accommodation as during the pre-Congress meeting/tour in Seoul are requested to write to the local organiser.

4. Post-Congress Tour I in Northern China

Aug. 19 arrival in Beijing

20 to visit urban expansion areas in the suburbs of Beijing

21 to visit the new vegetable production base in Yanqin County, Beijing

22 bus from Beijing to Wengniute County, Inner Mongolia

23 to observe landscape change of grassland in Wengniute County

24 bus from Inner Mongolia to Beijing / end

US $250 (includes accommodation, meals and local transportation)

5. Post-Congress Tour II in Western China (Aug 26 - Sept 5)

Aug. 26 flight from Beijing to Wulumuqi, Xinjiang / start
27 bus from Wulumuqi to Tulufan to visit historical relics and vineyard
28 bus from Tulufan to Kueler, to visit Bosteng Lake along the road
29 bus from Kueler to Kuche, to visit oasis agricultural region in dry-land areas
30 bus from Kuche to Alkasu, to visit dry-land areas in the Talimu basin
31 bus from Alkasu to Kashi, to visit husbandry development

Sept 1 bus from Kashi to Alkasu
2 bus from Alkasu to Kuche
3 bus from Kuche to Kueler
4 bus from Kueler to Wulumuqi
5 flight from Wulumuqi to Beijing / end

Cost: US $700 (includes accommodation, meals and local transportation, but excludes transportation from Beijing to Xinjiang)

If you would like further details, please contact (for Japan) Professor Y Himiyama or Dr Inchinose (himiyama@atson.asa.hokkyodai.ac.jp), (for Korea) Professor M Hwang (maniks@plaza.snu.ac.kr); (for China) Professor Lu Qi (luq@iog.ac.cn).

Registration: Registration for the Pre-Congress Meetings, Main Congress and Post-Congress Study Tours is done through the IGC Seoul Congress Agency by using an official registration form. Those who do not have the registration form should contact the Congress Agency at E-mail: choijk@kaltour.com Fax: +82-2-778-2514.

Abstracts: Abstracts of papers and posters, to be presented in the above meetings, should be submitted to the corresponding local organisers by e-mail or floppy disk before 1 February 2000. Abstracts should be less than 600 words in length, and should have the title of the paper/poster, author(s) name(s) and their affiliation(s).

IGU-LUCC Membership

If you are interested in the activities and possible membership of IGU-LUCC please write to Professor Yukio Himiyama, Institute of Geography, Hokkaido University of Education, Asahikawa, 070-8621, Japan with the following information. Date/title/name/institute or company/address/e-mail/URL/tel/fax/research interests/ professional activities related to Land Use and Land Cover Change. Those who are willing to add their personal information in the open members' list in the Group's website are requested to write to Professor Himiyama.
