
ALUMNI MAGAZINE
FACULTY OF GEO-INFORMATION SCIENCE
AND EARTH OBSERVATION
UNIVERSITY OF TWENTE

ITC NEWS

SPECIAL FEATURE
LAND FOR ALL

LAND FOR ALL



OPENING ACADEMIC
PROGRAMME

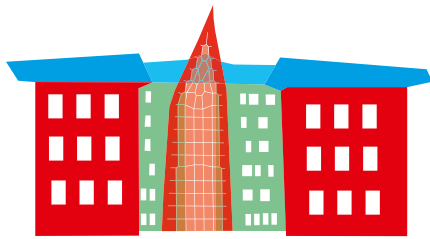


3D CADASTRE



GREETINGS FROM





GEOBIA2016

SOLUTIONS & SYNERGIES



GEOBIA 2016 announcement

From 14-16 September 2016 the Faculty ITC (www.itc.nl) of the University of Twente will host the 6th international conference of Geographic Object-based Image Analysis (GEOBIA 2016). It will focus on the theme *Solutions & Synergies*.

Under *Solutions* the conference will focus on existing bottlenecks preventing OBIA-procedures developed by the research community from being applied and implemented in practice, and ways to overcome those problems. *Synergies* relates to efforts to connect with researchers also working on segmentation-based image analysis in other domains, such as the bio-medical field or computer vision.

The GEOBIA conference will also feature an ISPRS-linked benchmark effort, where researchers working on urban science classification can have their solution objectively tested and evaluated (see website for details). The benchmark also relates to a focus of the conference on high spatial resolution data, including from UAVs/drones, and including oblique data that those instruments often provide.

There will also be a range of inspiring keynote speakers, including by distinguished researchers from outside the core GEOBIA community, to help set the research agenda in this field for the coming years.

**The deadline for abstracts is 1 March 2016,
and for extended abstracts 1 July 2016.**

Check the website (www.geobia2016.com) for more details, and register for updates.

See you in Enschede next year.



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"This picture was made from the airplane while on my way to conduct fieldwork in Nepal and it is a bird view of Kathmandu. Nepal is one of the most vulnerable countries in the world due to the effects of climate change" (Photo: Adish Khezri, Page 22)

INTRODUCTION



colophon

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It's that time of year again: the time when a colourful ceremony is held to officially mark the Opening of the New Academic Year; the time when new students from all parts of the globe are officially welcomed into the ITC community (page 3). On this particular occasion, it was also a great pleasure to welcome back ITC alumnus Wilber Ottichilo. Arriving at ITC for the first time in 1981 to participate in a series of courses, he then went on to obtain his doctorate in 2000, and now returned to deliver the Schermerhorn Lecture (page 3). It was a lecture warmly received by his audience, and one certain to inspire and motivate.

Professor Tom Veldkamp, dean of ITC, opened the proceedings, sharing his thoughts on the rapidly changing world of geodata. Perhaps to some extent we at *ITC News* can make amends to those unable to attend the ceremony by offering on page 5 an in-depth interview with Hon Dr Wilbur Ottichilo, explaining how the worlds of science and politics can connect.

As usual, this issue contains an array of articles dealing with various subjects. Even so, you'll be quick to notice that many are concerned with different facets of land administration. For instance, the role it plays in a post-conflict situation (page 15) or the role ITC itself plays as a committed partner of the Global Land Tool Network (page 20). The aims of an interesting new research initiative, ITs4land, are described on page 12, while the issue of developing capacity in the land administration sector is handled on page 8. These are just a few examples that will claim your attention, but should they or others whet your appetite for further reading on the subject, details of *Advances in Responsible Land Administration*, a new book hot off the press, can be found on page 18.

Reading may seem a somewhat passive activity, but this is by no means always the case. As new visions are being formulated, may we call your attention to the announcement on page 28 and, if it strikes a chord, encourage you to contact the author. He'll be most happy to hear from you.

A brief introduction then to *ITC News 2015-3*. Naturally, there is much more to unearth between these covers so, without further ado, I will bring this to a close by wishing you much pleasure in "prospecting for gold".

Virtually yours,
Jorien Terlouw
Editor



MAIN FEATURES

Vibrant Environment for Opening Academic Programme

Laurens van der Velde

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Dressed in traditional clothing from their country of origin, the international students formed a vibrant environment for the Opening of the Academic Programme of the ITC Faculty of the University of Twente (UT), which was held on 2 October at the Muziekcentrum in Enschede.

Dean Tom Veldkamp opened the academic programme and shared his thoughts on the rapidly changing world of geodata. The availability of new and extended data from modern (mobile) equipment leads to new opportunities for analysis and interpretation. They form a valuable addition to the processes of decision making but, at the same time, serious challenges arise concerning safety and privacy. Close collaboration between the ITC

faculty and the other UT faculties leads to new and useful insights into ways of dealing with both of these challenges.

As part of the packed programme, Honore Niyonsenga, on behalf of the Student Association Board, looked ahead to the coming academic year and welcomed the new students to the ITC community. The musical interludes were provided by the EVA Vocal Ensemble.

Dean Tom Veldkamp opened the academic programme and shared his thoughts on the rapidly changing world of geodata





Honore Niyonsenga, on behalf of the Student Association Board, looked ahead to the coming academic year



Students dressed in traditional clothing



EVA Vocal Ensemble

Schermerhorn Lecture

The Schermerhorn Lecture, named after Willem Schermerhorn, the founder of ITC, was delivered by Wilber Ottichilo, an ITC alumnus and currently Member of Parliament for the Emuhaya constituency in Kenya.

Ottichilo first arrived at ITC in Enschede in 1981, attending a course on Remote Sensing Techniques and Application. "I came as a village boy and went back as a global citizen. In Enschede, I met people from all over the world who were facing similar challenges. Problems that looked complex and unsolvable suddenly changed into challenges that we were able to handle adequately." In 2000, he received his PhD at the Department of Natural Resources.

His lecture included a warm plea to close the gap between science and everyday life. In his work as a Member of Parliament, he combines a scientific approach with the ability to translate the complex material to the level of the voters. Ottichilo showed some clear examples of how geodata supported decision making in the educational and agricultural fields.

ITC Publication Award

As has become a tradition, the ITC Publication Award has been handed out at the ceremony. This year's award, consisting of an award certificate and a cash prize, went to Mitra Shariati Najafabadi. Her PhD-project focused on predicting the timing of spring migration of avian herbivores. ■



Hon Dr Wilber Ottichilo



Mitra Shariati Najafabadi receiving the ITC Publication Award from Prof Veldkamp

Connecting the Worlds of Science and Politics

Laurens van der Velde

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His eyes twinkle as he speaks full of passion about his achievements in Kenyan politics. Wilber Ottichilo, 63 years old, has made it his life's work to connect the worlds of science and politics. On 2 October, the ITC alumnus was back in Enschede to deliver the Schermerhorn Lecture at the Opening of the Academic Year 2015-2016 of ITC.

Over the past few years, the politicians of Kenya have started to pay substantially more attention to science in both the realization of innovation policy and the manner of doing politics. "Our Parliament consists mostly of business people and lawyers," Ottichilo remarks. "They were only considering the economic effects or whether the laws were technically sound. Luckily this is now changing. Science has been put at the top of the agenda, and more and more we are considering what we can achieve in a scientific manner."

Sustainable Energy

Integration of science and politics does not just happen. Ottichilo talks proudly about the heavy lifting he has performed to make it happen. A great example is the future of the energy supply in Kenya. The law that makes nuclear energy possible had already passed through Parliament and a national nuclear energy agency had already been established. "But I was not happy with it. In Kenya, we have countless opportunities for sustainable energy generation – solar energy, geothermal energy, wind energy – sustainable and with considerably less risks attached."

"I arranged for a working visit with a large delegation to the International Atomic Agency in Vienna, in order to learn what scientists think of the risks. They explained the risks to us, as well as the huge effort a country needs to make to contain these risks. Subsequently, we visited a nuclear power plant in the Czech Republic. There we met scientists who had been working in the field of nuclear energy for 50 years and who told us that there is still no real solution regarding the handling of nuclear waste."

The visit made quite an impression on his fellow Members of Parliament. Ottichilo: "The discussion from then on considered the facts, not sentiments. After a while the leader of the coalition came to me and said that we ought to seriously reconsider our decision." Not long after that, Ottichilo effortlessly passed a motion through Parliament, which called on the government to shift its attention from the development of nuclear energy opportunities to investment in sustainable energy.

Changing Perspective

Whether it is about his fellow Members of Parliament or his constituency, Ottichilo's approach – being on their side, translating it into daily practice, and being patient – focuses on allowing everyone to join in the conversation on complex technological



"Everyone should be able to join in the conversation on complex technological subjects"

subjects. "Other Members of Parliament suddenly realized that they too could join in the discussion on complex technological subjects."

Increasing the accessibility of complex decisions made Ottichilo very popular. In May, in a survey performed by the renowned research agency Infotrack, he was elected Member of Parliament with the highest approval rating among his constituents.

He also makes big subjects accessible to his constituency, and innovation and technology are put in a prominent position. Take the sustainability dossier, for example. "People noticed that the weather was changing, but did not connect this with their own actions. We organized public hearings in public locations throughout the entire country. We engaged in discussion and particularly tried to be specific. Not just talk about abstract structures, but tracing them back to the core for the people. Why isn't water flowing in the river any longer? Why are the trees no longer growing? What has changed? By making it tangible, people saw what was happening. The demand for policy became louder, which led to the Climate Change Bill we now have – a first for Africa."

For and by the People

As a result of making politics and its content accessible, the inhabitants have become increasingly more involved in their own surroundings. "In 2014, I was closely involved with the realization of the new Wildlife Act. The guiding principle of the new policy is that the government should no longer be at the centre of power. The community will have to play more of a key role. Over the course of the years, the people considered government involvement as something negative. This stemmed from the colonization era, when people felt as if their country were being taken from them. Although the wildlife reserves were created to ensure the preservation of endangered species and nature, they only led to a situation where preservation remained limited to those areas."

Ottichilo: "By making the inhabitants responsible again, fences disappear and more space is created for nature and wildlife outside the reserves. There is a lot of respect for nature and people have always been used to living in harmony with nature. However, because they were no longer responsible, their attitude towards nature shifted. This will change now." ■

CURRICULUM VITAE

Having obtained his bachelor's degree in Biology, the 29-year-old Wilber Ottichilo arrived at ITC for the first time in 1981 to participate in a series of courses. "It really opened my eyes. I came as a village boy and left as a global citizen. It was my first time in Europe; I had never seen snow; I mixed with people from all over the world. Until then, I had never met any American or Chinese people. When we talked, I noticed we all had similar stories. They faced the same challenges and we all learned from one another's experiences. Problems that seemed unsolvable suddenly became challenges that we were able to deal with." In 1997, Ottichilo returned to ITC, obtaining a PhD in Use of Geo-information in Natural Resources and Environmental Assessment in 2000.

Ottichilo's first real job was in 1974, when he became a physics teacher at a secondary school in Maseno. He worked as a researcher and manager in various ministries, and accepted a job as director of the Regional Centre for Mapping of Resources for Development (RCMRD) in 2000. In 2008, he was elected Member of Parliament for the Emuhaya constituency, in the south-west of Kenya. In 2012, he was re-elected.



Wilber Ottichilo was elected Member of Parliament with the highest approval rating among his constituents



Hon. Dr. Wilber Ottichilo giving the Schermerhorn lecture during the Opening Academic Year



From left to right: Prof. Andrew Skidmore, Hon. Dr. Wilber Ottichilo and Prof. Emeritus Klaas Jan Beek

Land for All

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For every aspect of human life we need access to land in one way or another. This access is arranged in many different ways: public, group-related or private. In many cases, the ease of access differs substantially between groups in society. Especially for the powerful, rich and connected part of society this access goes without saying: it is part of the formal legal system of the society and is well protected by an advanced documentation system (land registry and/or cadastre). In this way, they have what we call “security of tenure”, which encourages them to invest, allows them to participate safely in the land market, and allows them access to relatively cheap credit via mortgages.

For those that are underrepresented – the poor, those living in informal areas, those belonging to traditional communities or minorities (often women and the youth) – this is completely different. Finding space to live and to make a living is often a daily struggle. Their relationships with land are ignored, or at best tolerated by the government and especially the formal land agencies. They suffer from “insecurity of tenure”, and often perceive threats of losing their access to the land and being relocated or even evicted by bulldozers. Although local (informal or even local government) initiatives give a primary level of security within communities, often they hardly help in cases of outside large-scale investments (e.g. the agricultural “land grabs”, urban expansion, infrastructural development, and even unscrupulous environmental policy implementation).

The need to address the problems of the second group is self-evident, and is also acknowledged under several diverse themes of the Sustainable Development Goals (poverty, food security, gender). The idea of a diversity of types of relations between people and land is increasingly being realized and accepted as a starting point for policy formulation and implementation. We can call this the pull towards land administration. Luckily, the ongoing developments in geo-ICT always give us the push towards land administration, making it possible to develop tools and approaches that can reach the three quarters of the world population that do not yet have comprehensive documentation of land relations, and therefore miss out on the advantages of security of tenure.

In the teaching, research and projects concerning land administration at ITC, we constantly aim at combining these institutional (societal, legal and organizational) issues with the technological (geo-ICT) possibilities. We apply this in many different settings – in different regions and countries, related to urban and rural issues, in stable and post-disaster and post-conflict cases – focusing on both the design and assessment of tools and interventions, and on the support of both land registration and land development. I hope you enjoy viewing the examples given on the next pages as much as we enjoyed compiling them. ■



Prof Mr Dr Jaap Zevenbergen

Developing Capacity Developers: A Curriculum for the Global Land Tool Network

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For a long time, capacity development was perceived solely as the enhancement of the knowledge and skills of individuals. More and more, it is also understood in terms of incentives and governance, and in terms of organizations and environment. Capacity development is generally defined as “the process whereby people, organisations and society as a whole unleash, strengthen, create, adapt and maintain capacity over time” (*OECD. The Challenge of Capacity Development – Working towards Good Practice*, p. 12).

Since its beginnings, ITC has been a vector for the development of capacity. At the individual level, generations of students and professionals have been trained and formed in the classrooms of ITC. At the organizational level, the ITC land administration group, in collaboration with Kadaster International, has directly participated in the creation and development of land administration systems worldwide. The department continues to promote good practices in land administration and to strengthen their capacities through refresher courses. But more importantly, it has participated in the development of academic programmes, enabling the emergence of national competences for the development of capacity in the land administration sector. Moreover, the group has built over time a solid network of partnerships with other universities, deploying an international framework for exchanges and collaborations. At the social level, the department has participated in the international rise of awareness concerning responsible and inclusive land governance and has promoted the importance of education in the development of land administration systems. At all levels of capacity development, the land administration group has been and still is active.

The development of capacity is one of the major issues related to country development – and collaterally to aid effectiveness – and one of the main points regarding the sustainability of any measures of development. Therefore, the General Assembly of the United Nations enjoined all its organizations to embed the notion of capacity building/development in their activities, and among others, to adopt measures that ensure sustainability in the development of capacity and to support the efforts to establish and maintain effective national institutions for capacity development (United Nations, A/RES/59/250). Consequently, UN-Habitat and the Global Land Tool Network (GLTN) now work to strengthen the capacity of land administrations in a pro-poor, gender-appropriate, effective and sustainable way (UN-Habitat. *Global Land Tool Network Phase 2: Secure Land and Property Rights for All*). GLTN looks specifically for partnerships with in-country institutions that “represent and articulate the contextual information, perspectives, experiences and positions on land.” Universities could be seen as the natural institutions for developing national capacities.

Beyond capacity development by the transmission of knowledge and technical skills, developing universities and academic programmes brings a new vision of development – the vision of developing capacity developers.

From this perspective, the issue is now to find out how this support could take form. The land administration group is charged with preparing a concept note on the feasibility of an undergraduate and a post-graduate curriculum for GLTN. At this point, the objective is to make an inventory of the existing realizations in relation to GLTN; to assess the needs; to create a consortium of partners; and to define objectives and strategies. Some regional initiatives already exist, such as the Curriculum Resources realized by the Association of African Planning Schools (www.africanplanningschools.org.za/resources/curriculum-resources), but the question is how to bring all these initiatives and partners together and how to create sustainable partnerships for capacity development. As a new perspective is opening up in the way to develop capacities in the land administration sector, GLTN plays the role of catalyst, bridge builder and facilitator, while ITC takes on the role of a leader and a key partner. ■



The department has participated in the international rise of awareness concerning responsible and inclusive land governance



The ITC land administration group, in collaboration with Kadaster International, has directly participated in the creation and development of land administration systems worldwide

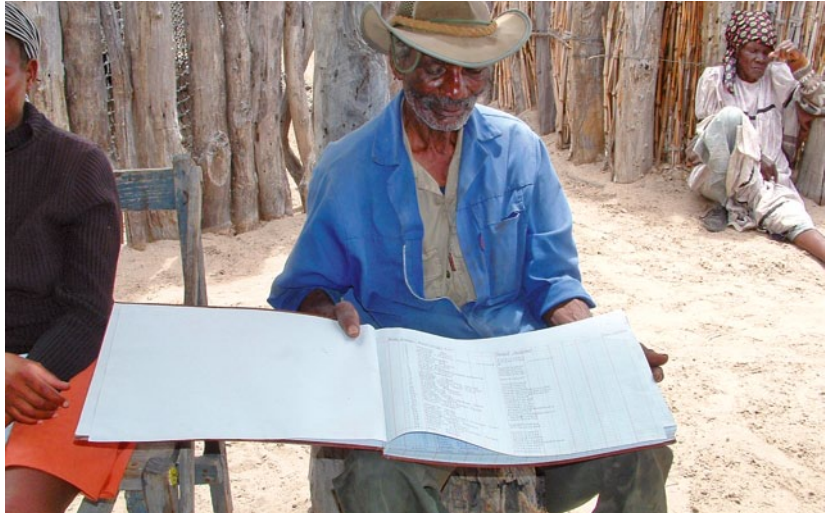


FIG: Your Home away from ITC

Liza Groenendijk

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You must all know FIG, the International Federation of Surveyors, with its bright red logo. But do you know about ITC's active role in this professional organization? Let me give you a short (re-)introduction. FIG is a United Nations- and World Bank-recognized non-governmental organization of national member associations and covers the whole range of professional fields within the global surveying community. It provides an international forum for discussion and development, aiming to promote professional practice and standards. Ten commissions lead FIG's technical work.

ITC-University Twente is an academic member of FIG. Staff from the land administration domain are well represented within FIG, its various commissions, working groups and task forces. Jaap Zevenbergen, Christiaan Lemmen and Paul van der Molen are active contributors to FIG Commission 7: Cadaster and Land Management. They are driving forces in the discussion and development of innovative and pro-poor approaches in land administration. ITC has played a key role in Commission 2: Professional Education in the field of e-learning. Currently ITC is hosting the chair of FIG Commission 2. Over the years, ITC has organized and contributed to several FIG workshops and conferences. In the FIG publications and proceedings, it is not difficult to find the names of ITC authors. Participating in this international professional organization has great benefits for ITC and the UT. Through its participation in FIG, ITC is well connected to the professional field. Technological developments have changed the work of the surveyor dramatically. The introduction of the broader concept of the land professional is a response to this develop-

It is a pleasure and often great fun to work together with other FIG members from all over the world, many of them ITC alumni



ment. UN-Habitat, the World Bank and FAO are well embedded in FIG. As an active member in FIG, ITC takes part in the main global platforms and think-tanks responding to the world's major challenges, such as climate change, disaster management and responsible governance of tenure of lands, fisheries and forests. Being part of the FIG "family" means hard work – often in your spare time. But above all it is a pleasure and often great fun to work together with other FIG members from all over the world, many of them ITC alumni. To conclude, I would like to mention the FIG Young Surveyors Network at the moment chaired by Eva-Maria Unger, a PhD student supervised by ITC's land administration staff. I recommend all our young students to join – and pave the way for the surveyors of tomorrow. So join FIG! You will feel at home. ■

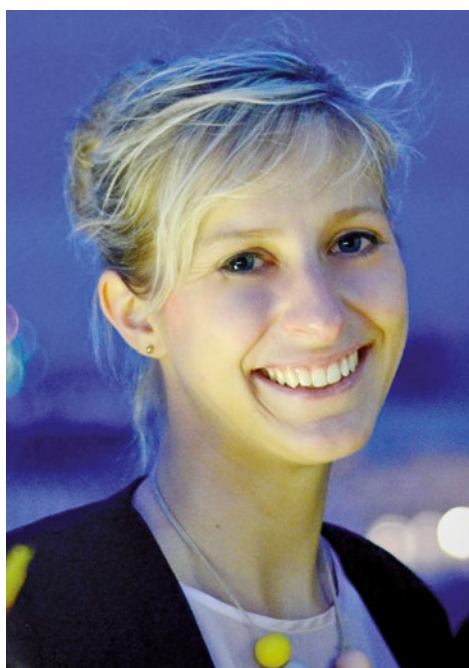
Ensuring the rapid response to change, ensuring the surveyor of tomorrow

• Chryssy Potsiou, FIG President

Liza Groenendijk is involved in the MSc and post-graduate course Land Administration. She is the portfolio holder Eastern Africa of the School of Land Administration studies. She is a member of the International Federation of Surveyors (FIG) and she chairs Working Group 2.2. (e-Learning), Commission 2 (Professional Education). www.fig.net/



Liza Groenendijk



Eva-Maria Unger, Chair FIG Young Surveyors Network

Surveyors of tomorrow: it is us who are going to make a difference in the world!

• FIG YSN

Its4land: A Major New Land Administration Research Initiative for ITC

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Commencing in February 2016, ITC will lead a consortium of eight partners in a new 3.9M EU research programme entitled Its4land – Geospatial Technology Innovations for Land Tenure Security in East Africa. The project is funded by the European Commission’s Horizon 2020 research programme, under its ICT sub-theme focusing on international partnership building in low- and middle-income countries. The new four-year venture will see ITC collaborate across continents and industry sectors by teaming with experts from the Institute of Land Administration (Bahir Dar, Ethiopia), the Technical University of Kenya (Nairobi), Institut d’Enseignement Supérieur de Ruhengeri (Rwanda), KU Leuven (Belgium), Westfälische Wilhelms-Universität Münster (Germany), Hansa Luftbild (Germany) and Esri-Rwanda (Rwanda).

Its4land aims to deliver an innovative suite of land tenure recording tools that can support responses to sub-Saharan Africa’s urgent challenge to rapidly and cheaply map millions of unrecognized land rights. The consortium argues ICT innovation can play a central role, along with new approaches to governance and business models enabling private sector involvement. Previous initiatives aimed at providing land tenure security have resulted in mixed outcomes at best. Disputes still abound, investment remains impeded, and the community’s poorest continue to lose out. Its4land will respond to these challenges by developing solutions that can ideally be adapted and scaled.

Its4land reinforces strategic collaboration between the EU and East Africa. The project is not starting from scratch: established local, national and international partnerships are key to the project. The experienced consortium is multisectorial, multinational and multidisciplinary. The ultimate aim will be to drive project results beyond R&D into the commercial realm. This is why the involvement of both Hansa Luftbild and Esri-Rwanda is essential. Their understanding of how to develop tested prototypes into scalable and operational enterprise systems will be crucial as the project progresses.

From the technological side, Its4land intends to combine a multi-sectorial innovation process with emerging geospatial technologies (including smart sketchmaps, UAVs, automated feature extraction and geocloud services) to deliver land recording services that are end-user responsive, market driven and fit for purpose. The transdisciplinary work will also develop supportive models for governance, capacity development and business capitalization. Gender-sensitive analysis and design are also incorporated: females are already well represented in the makeup of the consortium leads and project staff.

Based in the East African development hotbeds of Rwanda, Kenya and Ethiopia, Its4land will consist of eight work packages that enable contextualization, design, and eventual support for land sector transformation. In line with Living Labs thinking, localized pilots and demonstrations will be embedded in the design and development process. Beyond the tools and project outputs, the project will also contribute to East African land administration through the funding of five PhD scholars and one postdoc. ■

If you’re interested in learning more about Its4land, or even in becoming involved, please contact the project coordinator, Rohan Bennett (r.m.bennet@utwente.nl), for more information.



European Commission’s Horizon 2020 research programme

Joint Learning Programme on Innovative Concepts, Tools and Practices in Land Administration

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For the past few years, RCMRD, GLTN, Kadaster and ITC have run a two-week joint learning programme on innovative concepts, tools and practices in land administration.

Typically, the main purpose of land registration is to secure land rights, as well as to support the broader land administration by making information about land tenure available. There is general consensus that currently about 70 percent of tenure information in developing countries is not documented. This means the rights to land of the majority of people are neither recognized nor legally and institutionally supported. People and communities living under undocumented tenures are susceptible to tenure insecurity. A paradigm shift offering an alternative framework is needed to include the interests of the majority of the citizens, particularly the poor, rural and urban populations.

The recent joint learning programme brought together land officials, technical personnel and experts from member states of the RCMRD and also from outside the region. Member states shared experience and information regarding key land administration approaches, achievements, and the challenges they face. Innovative concepts, tools and practices in land administration were described, analysed and practically illustrated. A need to move away from the conventional land administration methods of acquiring tenure information towards affordable and flexible approaches that are fast, cheap and inclusive (fit for purpose) was discussed. Fit-for-purpose approaches would enable the capture and management of a rich complexity of tenure systems and land rights on the ground as is. This means including the least secure tenures (e.g. squatters' rights) as well as those with some degree of security (e.g.



Joint learning programme on innovative concepts, tools and practices in land administration



Joint learning programme on innovative concepts, tools and practices in land administration

customary rights). Using fit-for-purpose approaches would therefore be a means to address the problems of conventional land administration.

The first week of the training introduced the concepts and approaches for innovative land administration and registration, while the second week focused on hands-on sessions using QGIS and the social tenure domain model (STDM). ITC, represented by Dr Monica Lengoiboni, gave training on innovative land registration and the importance of innovative approaches in land registration. ■



Land Governance: Assessing Gaps in Land Curricula

Monica Lengoiboni

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There is a commitment by the AU member states to build adequate capacity (human, institutional, financial) for land policies and establish an appropriate institutional framework for the implementation of the AU declaration on land. It is against this background that in May 2015 the Land Policy Initiative (LPI) organized an Expert Group Meeting (EGM) in Bahir Dar, Ethiopia, where land governance training and curricula in institutions of higher learning in Africa were discussed. The workshop was part of the implementation strategy of the AU declaration on land, which is dedicated to enhancing capacity and skills in support of land policy development and implementation

The AU Framework and Guidelines on land policy in Africa identifies capacity building and skills enhancement as one of the main challenges confronting land policy implementation. This, along with the lack of technological know-how required to manage contemporary land reform programmes, is also cited as a major constraint to the implementation of land policies in the continent. Capacity building in tertiary institutions of learning could be an avenue for enhancing capacity and skills while addressing the dynamism of land use and institutional changes in Africa. In response to this, the LPI is currently undertaking a study entitled “Curricula Gaps Assessment and Institutional Mapping”, which aims to assess the training needs and recommend avenues for improving training on land governance in the African tertiary institutions of higher learning. In addition to the capacity needs assessment formulating recommendations, the study will identify tertiary institutions of learning that could potentially participate in

the African Centre of Excellence on Land Governance (ACELG), which is currently in the preparatory stages of development.

The EGM in Bahir Dar brought together a number of lecturers from several African countries and beyond. At the workshop, early findings on the institutional mapping assignment were presented and participants were invited to contribute by brainstorming on three main questions, i.e. by providing additional information on what land-related studies exist in the continent and identifying gaps in relation to land governance; by discussing priority needs in land-related education and research; and by discussing possible models for the ACELG. The outcomes of the workshop will enrich the ongoing institutional mapping study by providing additional knowledge, data and references concerning the training/curricula on land governance.



The Expert Group Meeting in Bahir Dar, Ethiopia



Land governance training and curricula in institutions of higher learning in Africa were discussed

A tripartite MoU between LPI, GIZ/BMZ and the World Bank has been signed to support the creation of the African Centre of Excellence on Land Governance. The main role of ACELG will be to enhance the role of African Universities and research institutions in support of land policy development, implementation and monitoring. ACELG will be hosted by LPI. It aims to partner with African universities and networks, and policy think-tanks in Africa and outside that conduct training and research in aspects of land

governance. Collaboration with academic and research institutions that deal with land is important to train and retool land professionals; to generate research, evidence and knowledge; as well as to undertake monitoring of the land sector. At the EGM, the agenda for ACELG was presented by Thea Hilhorst of the World Bank. Discussions about the rationale, agenda and funding for ACELG were led by Joan Kagwanga (LPI), Thea Hilhorst (WB), and Jorge Espinoza and Marc Nolting (GIZ). ■

Post-Conflict Land Administration: Facilitator of Post-Conflict State Building

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Land and its administration are always negatively affected during conflicts and in post-conflict contexts. This has been confirmed both in the literature and in practice. This research has shown that if land and its administration are neglected or not properly addressed after the end of a conflict, they can be a cause for renewed armed conflict and an obstacle to the rebuilding of a post-conflict society. The authors' initial research on the topic revealed the gap in knowledge in the literature about the relation between land administration and post-conflict state building (as illustrated in Figure 1).

Therefore, the main research objective of the PhD is *to identify which interventions in land administration facilitate post-conflict state building under which circumstances*.

In order to achieve this main research objective, a qualitative research approach is applied to two main case studies: Kosovo and Rwanda. Findings from these main case studies are supported by three supportive case studies, Mozambique, Cambodia and Timor-Leste, by collecting data from the literature. The research first derives general findings on land, conflict and post-conflict contexts, and at the end specific findings are presented

within a framework for rebuilding post-conflict states and grouped as institutional weaknesses, economic and social problems, and serious security problems.

With regard to *institutional weaknesses*, this research has shown that development of a national land policy in post-conflict contexts resulted in a benefit to all related users. This was most efficient when it was developed within a broader national development strategy, jointly created and accepted by all related stakeholders. The land policy needs to contain clear directions about the development of the land law and the appointment of specific organizations with a mandate for enforcement of the law

and the policy. In all researched cases, the creation of specific organizations, such as land administration organizations and land claim commissions, revealed that this supported the governmental structure and strengthened the weak post-conflict political system. In addition, capacity building was required and implemented in relation to the legal framework, the creation of organizations, the education and training of land professionals, and equipment. In all cases, building capacities was supported by assistance from international actors or development partners. Findings from this research have shown that the mentioned land-related activities are most effective and efficient when developed with international assistance and through implementation programmes. Interventions in land administration, as discussed in the final analyses, contributed to improvements in the low legitimacy of the political leaders and the legitimacy of the state as well. For one of our cases, Rwanda, findings showed that building the legitimacy of the state was initially based on the ad hoc land sharing policy, allocation of state land, and housing and village settlements.

With regard to *economic and social problems*, the conclusions of this research were as follows. Addressing the specific land management/administration intervention within the peace agreement documents in three researched cases, and addressing land issues as regards displaced persons in all cases were the first step in the involvement of land and its administration in the improvement of the economic and social situation in post-conflict contexts. In addition, the creation of specific land claim commissions and land administration organizations supported the population and specifically the displaced people in settling the land disputes and reduced the social and security tensions. The aim of land administration organizations is the creation or improvement of the land registration and land administration system. Our cases showed that this was successfully realized supported by implementation programmes or projects, which further contributed to a sustainable development and supported the real property market. The success of the implementation programmes and projects, as was the case in both main case studies, reveals that it influenced the economic development and reduced social tensions. Development of land administration, specifically in the creation of land records (in four cases) or the recovery of the land records (as in the case of Kosovo), contributed to the service provision to all land-related sectors and significantly increased the security of

land rights. This supported the establishment of the land market and improved the overall economic development. This research showed that when land records became available, provision of land products and services assisted the requirements of displacement and destroyed properties.

With regard to the *security situation*, addressing specific land management/administration (in three cases) and land-related issues concerning the displaced population in the peace agreement document (as shown in all five cases of this research) contributed in some degree to addressing the difficult security situation. Land dispute and claim mechanisms were adequately developed in each of our cases. In addition, this research revealed that these mechanisms are seen as instruments that supported the settlement of the disputes over land and reduced conflict tensions.

The main findings from this research lead to the conclusion that the identified interventions in land administration can be seen as facilitators of post-conflict state building. ■

The final result of the research, sponsored by the Netherlands' Kadaster, will be defended on 3 February 2016



Cadastral map with updates from Kosovo, scale R=1:500
(photo from fieldwork D. Todorovski, 2013)

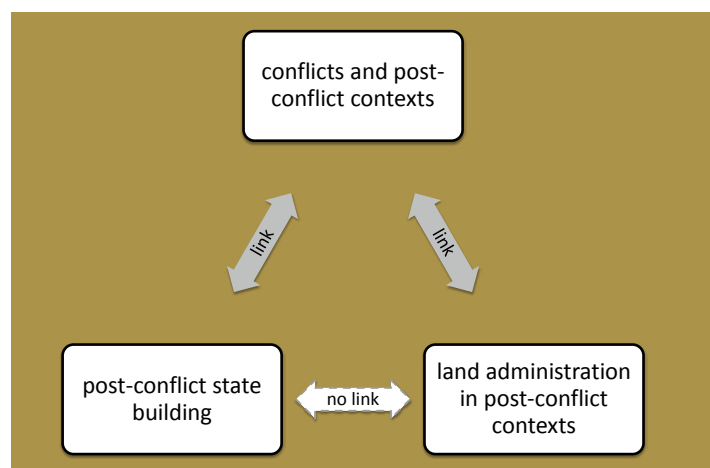


Figure 1 The gap in the knowledge (adopted from Todorovski et al., 2012)

E-Governance for Effective Land Administration Services

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A refresher course on E-Governance for Effective Land Administration Services was successfully conducted from 17 to 28 August 2015 in Ulaanbaatar (Mongolia) and well-coordinated by the national agency Administration of Land Affairs, Geodesy and Cartography (ALAGaC), with strong support from Nomad Systems LLC, a private enterprise that deals with land issues in Mongolia.

Twenty alumni (13 females and seven males) from eight south and southeast Asian countries (namely Bangladesh, Bhutan, Cambodia, Mongolia, Nepal, Philippines, Sri Lanka and Thailand) participated in this refresher course, which was fully sponsored by the NUFFIC fellowship programme. The programme was officially opened by Mrs Gochoosuren Baigalmaa, Vice-Minister of Construction and Urban Development in Mongolia. This refresher course was intended to provide new insights and innovative ideas concerning the policy and strategy of their organizations in the e-governance setting, with a high level of transparency and effectiveness of land administration services contributing to the socio-economic development. The refresher course highly regarded the involvement of the private sector and the use of land information systems for e-service delivery to the citizens. In addition to the series of lectures and practical inputs by ITC staff, ALAGaC and Nomad Systems, excellent lectures on the governance system and e-services in Mongolia and a workshop on gender sensitization were delivered by three distinguished Mongolian experts from (i) the National Academy of Governance, (ii) the Information Technology, Post and Telecommunications Authority (ITPTA), and (iii) the National Committee for Gender Equality in Mongolia, respectively.

Another interesting part of the refresher course related to learning and experiencing the nomadic lifestyle and the culture of the Mongolian people, where understanding land issues took the participants into most deeply rooted land issues embedded within the nomad culture. The participants spent a night at Ger camp to familiarize



Twenty alumni from eight south and southeast Asian countries participated in this refresher course

All participants are awarded with a certificate

ITC alumni gathered together to share interesting experiences gained on their professional journeys



themselves with the nomadic lifestyle by visiting the nomad family and attending the Naadam traditional festival. This refresher course also included several visits to the IPTA office, the provincial land affairs office, the property office, the municipality office and a big telecommunications company. These offices demonstrated the latest ways of providing e-services for the variety of land-related issues in governance settings, including the involvement of international non-government organizations in facilitating community participation in decision making on the delivery of urban services. During the visit to the telecommunications company, the National TV

Channel of Mongolia interviewed Dr Tuladhar on the issues of e-governance and service delivery, and on how the country could improve services using geo-ICT. This interview was broadcast the same night on the TV channel. (See interview on website <http://youtu.be/znXfuSvhl30>.) The last two days were dedicated to presentations by participants on own country situations, in order to share experiences and lessons learned on e-governance. All participants then prepared the action plans that they wished to carry out after their return home. Finally, the awarding of certificates of attendance to all 20 participants brought the programme to a close.

An enjoyable event was held in the evening of the last day, 28 August 2015, when ITC alumni gathered together to share interesting experiences gained on their professional journeys. More than 70 ITC alumni, including the refresher course participants, attended the gathering. Dr Bayasgalan, who studied at ITC in 1994, welcomed the ITC alumni and shared the joy of an event where refresher course participants from other countries were also present. The gathering ended with an excellent dinner supported by ITC. ■

Advances in Responsible Land Administration: New Book from ITC

Walter de Vries

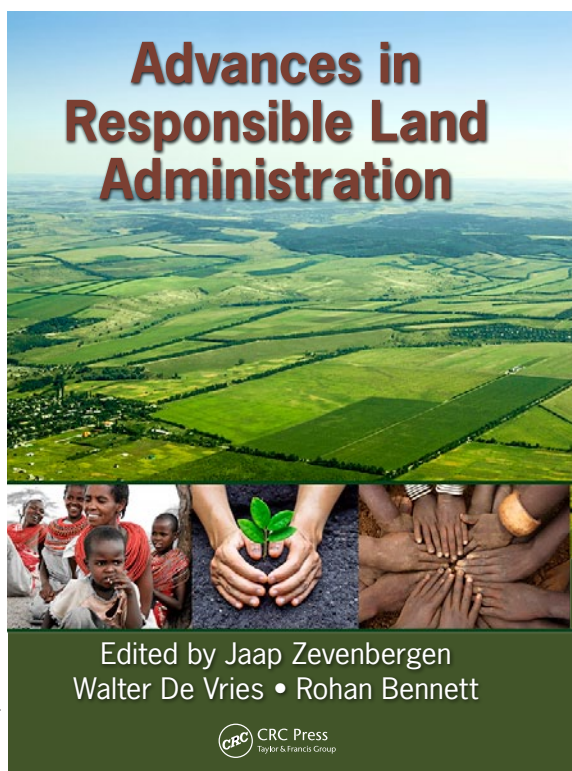
wt.de-vries@tum.de

We have published a new book: *Advances in Responsible Land Administration*. The idea for the book came from the work of multiple MSc and PhD students, combined with personal project experiences and research work. We have aggregated these under the term “Responsible Land Administration” and the book presents a consolidation of knowledge that had for a long time been hidden and fragmented.

The result is a book that on the one hand is strongly rooted in empirical data, yet on the other is also firmly grounded in scientific concepts and methods. The book delivers findings surrounding the design and evaluation of responsible land administration approaches. It starts by examining contemporary forces that are changing the way land is managed and administered. These include a wide variety of technological innovations, post-conflict behaviour and contexts, rural poverty and food security. A design section considers land information system design, innovative data capture tools and techniques, and algorithms and approaches to support land consolidation and pastoralist land administration. In addition, the book reflects upon the outcomes of the new approaches, paying specific attention to workflow design, land use changes, land tenure perceptions, conflict reduction and governance measures.

International reviewers emphasize that in the emerging era of new land administration new inspiration and innovative approaches are critically important in order to move forward. Furthermore, by introducing the concept “Responsible Land Administration” the authors add a new notion to conventional

Cover *Advances in Responsible Land Administration*



approaches by aligning the administration with the ever-changing dynamics of societal demands.

All in all, the essence of the adjective “responsible” for land administration is the adoption of a collection of practices in relation to land. These include a multi-stakeholder focus, multi-disciplinarity in conceptualization, pro-activeness in execution, international focus in finding solutions, and the constant aim to be relevant and usable. Responsible land administration is especially developing within the context of the Anthropocene – an urban

age where global challenges of rapid and massive-scale urbanization and migration coincide with major conflicts relating to land, food security, water, infrastructure and other resources. ■

The book *Advances in Responsible Land Administration* is published by CRC Press of the Taylor & Francis Group.

It is available via www.crcpress.com/product/isbn/9781498719599.

3D Cadastre in the Land Administration Programme

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Nowadays, there are a lot of developments in the fields of 3D cadastre, building information modelling (BIM), 3D GIS and 3D technologies for the proper visualization and modelling of the complexity of the built urban environment. Research on 3D cadastre is already being undertaken in almost 30 countries. The third dimension is important for the registration of objects above or below ground, and it would also be beneficial to include time (4D) in order to record how legal status changes over time.

The PGM department has made recent efforts to upgrade current education and research activities to incorporate technologies, methodologies and innovations relating to 3D cadastre. Some changes and improvements are already being implemented in the land administration specialization of the MSc programme. 3D modelling using different technologies will be included. These will be beneficial for 3D cadastral object reconstruction where conventional methods are insufficient. The possibilities for low-cost solutions for 3D data collection, modelling and distribution – for example, the usage of non-metric cameras and even smart phones – will be also included.

Regarding my own background, after being a lecturer in Photogrammetry and Remote Sensing and obtaining my PhD degree it was my pleasure to join the PGM department in August. The aim of my dissertation was to present the opportunities for three-dimensional visualization and modelling in architectural photogrammetry and the possibilities for their interactive representation. To clarify the methods, systematic research and comparative

analysis regarding the principles and technological processes needed for 3D modelling in modern architectural photogrammetry were performed. To solve the problems relating to the proper selection of the methodology, classification according to criteria for comparison was proposed. After the detailed literature review and a theoretical clarification of the possible methods that can be used for 3D modelling, the main efforts were concentrated on the practical part. As a result, three differ-

ent technological methods for the visualization and creation of three-dimensional models and their interactive representation were proposed:

- 3D image-based modelling using non-metric handheld cameras
- 3D visualization of cultural heritage using 3600 panoramic cameras
- 3D geometric modelling and photorealistic modelling based on architectural plans.



Webportal for visualizing panoramas for touristic objects

The important factor was that all of them were also realized practically. For example, the web portal specially created for visualizing the panoramas for 50 touristic objects was published on the websites of four Bulgarian municipalities in three languages (http://regtour.lovech.bg/LOVECH_ENG/index.html). The touristic objects were organized in routes and supported with GPS coordinates, routes, images, radar, tourist information and videos.

For each of the above-mentioned methods, the technological processes were described, clarified and compared and the main scientific results were systematized. As a conclusion, suggestions and guidelines for future development were given. ■



3D image-based modeling using non-metric hand held cameras - Hotel Hilton in Sofia



3D geometric modeling and photorealistic modeling based on architectural plans

ITC: A Committed GLTN Partner

Jaap Zevenbergen

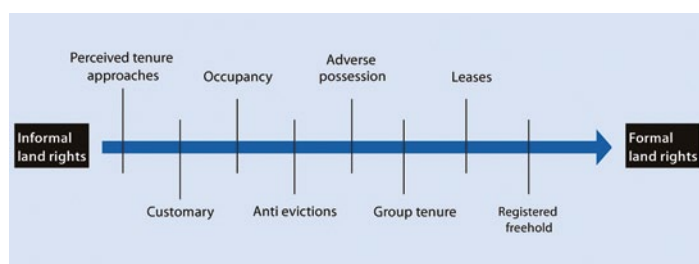
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In the last ten years, a lot of the work to improve the situation of the three quarters of the world population whose access to land is undocumented – and therefore often under threat – has been brought together, coordinated and aligned within the Global Land Tool Network (GLTN). ITC is one of the founding partners of this continuously growing network, which today brings together 70 internationally active organizations that feel committed to addressing these global land tenure and land governance challenges. Organizations come from very different backgrounds, and are clustered into civil society organizations (both urban and rural), professional bodies, multilateral and bilateral donors, international training and research organizations, as well as grassroots representation.

With the realization that the conventional, mainly Western-inspired, approaches to documenting (individual) ownership rights with complex, time-consuming and expensive surveying techniques and legal procedures were making no more than a dent in the enormous amount of undocumented land relations, a call for another approach became increasingly heard in the first years of this century.

Acknowledgement of the diversity of forms in which people relate to and hold interests in land in the broad sense (including buildings, trees, etc.) was looming, but the lack of appropriate land tools to deal with this diversity was often used as an excuse not to really commit. This led to the establishment of GLTN, which aims to explore and develop pro-poor and gender-appropriate land policies and tools. Facilitated by UN-Habitat, GLTN partners recognize and promote the concept of a continuum of land rights (UN-Habitat 2008, 2012).

Along the continuum, different tenure types are featured: the complex interactions between individuals, groups, land resources, plots, dwellings and settlements should all be catered for. As GLTN partners express it, conventional land titling approaches have largely failed to deliver their expected results because the existing technical solutions are expensive, inappropriate for the diversity of tenures found in developing countries, and unsustainable in terms of finance or available capacity.



A continuum of land rights (UN-Habitat 2008)



Sixth partners' meeting of GLTN, Nairobi (Kenya)

Individual land titling by itself is too slow and cannot deliver security of tenure to the majority of people in the developing world (Zevenbergen et al., 2013).

Although the concept is incrementally and widely accepted in the global discourse, a new set of land administration and information management systems are necessary to support and implement the continuum of land rights. In practical terms, this means responding to the needs and requirements of three quarters of the citizenry in a developing country (mostly comprised of poor people), and providing them with equal socio-economic opportunities. Developing and enabling the rolling out of land tools to make it possible to implement such inclusive policies has constituted the bulk of the work of GLTN.

The land administration group within ITC has been contributing to GLTN since its formation process. Two well-established tools have been heavily influenced by research and design work carried out at ITC: the Transparency in Land Administration training toolkit, and the social tenure domain model (STDM). Currently, three ITC-led projects are about to be completed, focusing on the design of a land capacity needs assessment tool (to determine what capacity development activities would be needed to develop and implement an inclusive land policy, and how and with whom to undertake these); the second phase of the so-called "pro-poor land recordation" approach (in which land documentation is primarily kept for, by and within local communities to secure the land tenure types and transactions in those that take place locally (a co-management approach is suggested to balance biased local power structures, and to allow (future) linkage

with the land agencies); and finally a study into the need and possible approach to create a GLTN-inspired land curriculum (available for inclusion in any existing university programme that trains land professions, see page 8).

In addition to these ITC-led projects as part of land tool development, land administration staff have also participated as experts in many expert group meetings, workshops and expert consultation meetings. Furthermore, for eight of the past ten years they have been represented on the International Advisory Board, which is composed of a representative from each of the mentioned clusters. In 2013, together with our main partner in many land administration-related activities, Kadaster International, we hosted the biannual Partners Meeting at the Dutch Ministry of Foreign Affairs in The Hague. Much of our PhD research focuses on land issues that are on the GLTN agenda, but in true academic tradition, GLTN's work is scrutinized as critically as anything else by the PhD candidates. In the Land Administration specialization of the ITC MSc, GLTN experiences and land tools are embedded in several places, with most visibly the concept of the continuum of land rights and pro-poor approaches (module 7), the STDM (module 10) and the Transparency in Land Administration training toolkit, which has been the basis for the development of the advanced module Land Governance. In all these ways, ITC has profited from GLTN and GLTN has benefited from ITC – and most importantly ITC has been and will continue to be a part(ner) of GLTN. ■



Mountain-SDI for Integrated Land Administration and Climate Change

Adish Khezri

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I am doing research at the Department of Urban and Regional Planning and Geo-information Management (PGM) to develop a community adaptive system that enables timely and reliable delivery of land information and related services in climate change adaptation to mountain communities, as well as relevant stakeholders (including policy makers, and government and non-government organizations)

I started my research work with interesting opportunities for the review of the 2014 IPCC Synthesis draft report on climate change, and this made me to understand the lack of a common language to understand the goals and priorities in adaption policy, design and planning. My initial findings show that 12% of the world's population are mountain people. They live on land and use it to farm, raise livestock and provide shelter for their families. Many of them do not have access to the land and climate information that would help them to manage their land and resources in a sustainable manner. It is often the case that they are not able to settle in secured, safe and healthy places to pursue their livelihood.

Nepal is one of the most vulnerable countries in the world due to the effects of climate change. Studying climate change adaptation policies, and interviewing and discussing climate change policies and strategies with policy makers and key experts of the national and district offices, NGOs, and community groups in Nepal gave me immense experience, as well as evidence of the need for a community adaptive system that can provide information services to the communities and interact with stakeholders at the various spatial scales of global, regional, national and community levels. Similarly, attending the international conference Mountain People and Adapting to Change organized by the International Centre for Integrated Mountain Development (ICIMOD) in Nepal also gave me the opportunity to have dialogues with international participants regarding their research to justify the need for such a community adaptive system for climate change adaptation. As an innovative solution, one of the main outcomes would be a community adaptive system based on mobile technology that enables mountain people to have timely access to land information and services – thereby increasing resilience to the risks of climate change and its impacts. Such a system would form the basis for effective management in both present and future planning for the most fragile environment in the world – the mountain areas. ■



“Nepal is one of the most vulnerable countries
in the world due to the effects of climate change”

More Research in Land Administration

The research, *Integrating Urban Governance and Land Governance*, is conducted on the theoretical concept of “action space” and is deeply rooted in the legitimacy concept for informal settlements. The research approach includes a series of real case studies that provide in-depth knowledge of dealing with informal settlements in Nepal. Initial findings indicate that there are strong debates between legal legitimacy and social legitimacy because of policy constraints in informal settlements. The outcomes of this research are expected to be appropriate models, techniques and tools for tackling the societal myth of informal settlers, i.e. Struggling for Space. ■

“I am investing the knowledge caps that exist in managing informal settlements in urban land governance and explore the interaction between three key urban actors, namely government, civil society and the market”

Reshma Shrestha
r.shrestha-1@utwente.nl



“I am analysing the dynamics behind the interrelationships and entry points for alternative land administration, targeting the three disaster-risk drivers exposure, vulnerability and hazard. This is relevant for the advancement of pro-poor land administration tools and their application in natural disaster-risk areas”

Eva-Maria Unger
e.unger@utwente.nl



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EVENTS



27th International Cartographic Conference (ICC 2015)

Corné van Elzakker

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The International Cartographic Association is up to date and alive and kicking. Its mission is to promote the disciplines and professions of cartography and GIScience in an international context. The work of ICA is continuously going on in a variety of commissions that bring together the world's leading experts in many subdomains of the discipline (e.g. generalization, open source geospatial technologies, SDI and standards, use and user issues, and visual analytics).

Because of the international focus, ITC and ICA have always had close links (to their mutual benefit), if only because ITC has provided ICA with some key players. For instance, the founder of the ITC Cartography Department, Professor Fer Ormeling Snr was ICA's president from 1976 to 1984, and various ITC staff and alumni are and have been active in different commissions (serving as chair or otherwise).

Every other year, an ICA International Cartographic Conference is organized in a different place in the world, coinciding every four years with the ICA General Assembly. Depending on the location of the conference, and the economic situation, the conference is normally attended by some 750 to 2000 delegates from all over the world. Through pre-conference workshops, oral and poster sessions, meetings and exhibitions, the delegates are exposed to all recent developments in cartography and GIScience.

Although the conference programme is extremely tight and the delegates have diaries full of activities and sessions, it is a tradition that an ITC alumni reception is organized at every ICA conference. This offers the opportunity for current ITC staff to bring the ITC alumni up to date with the latest developments at ITC and for staff and alumni to share past experiences. This time the conference was attended by some 30 to 40 alumni from countries such as Chile, Botswana, China, Turkey, South Africa, Iran, New Zealand and the UK. As both ICA and ITC grow older, the range of ages increases as well, and it was nice to clearly notice this at the lively reception.

During the conference in Rio de Janeiro, the 16th General Assembly of ICA took place. In two meetings, new commissions with new terms of reference were established and new commission chairs and a new executive committee were elected. Corné van

ICC 2015 was held from 23 to 28 August in Rio de Janeiro, Brazil. Those who are curious about the latest developments in cartography and GIScience may want to have a look at the detailed conference programme at www.icc2015.org. The Proceedings are also already online at http://icaci.org/files/documents/ICC_proceedings/ICC2015/. Moreover, through the ITC library you can gain access to a selection of full (peer-reviewed) papers that have been or will be published in special issues of *The Cartographic Journal*, *Cartography and Geographic Information Science* and *Cartographica*. Selected contributions are also published in the Springer book entitled *Cartography – Maps Connecting the World*.

Elzakker stood down as chair of the ICA Commission on Use and User Issues and received an award for outstanding services to ICA. More importantly, Professor Menno-Jan Kraak was elected as ICA's new president for the term 2015-2019. So, after Ormeling's resignation in 1984 ITC is again providing a new president for ICA. ■

During the ICC 2015 an ITC alumni meet was organized



Greetings from...

NAME:

Xiaoxu
(Mandy) Li

JOB DESCRIPTION:

International Intern at ESRI
under the Consulting and
Project Management Team
for Natural Resources

ACTIVITIES:

The main focus is on a project in
agricultural development, with the
aim of reducing hunger and
poverty across Sub Saharan Africa
and South Asia by increasing the
productivity of small farmers.



Project work

I have worked in professional services, database services and in the maritime team, where we deal with bathymetric data and develop desktop extension for users to manage and store their large amounts of ocean data. My work focuses on research and development concerning the depth contour generalization method. It concentrates on the bathymetric data where the contour generalization process should take shoal bias into consideration. I have constant meetings with my manager, as well as many opportunities to reach out to different teams at Esri and consult its developers on different algorithms and approaches and seek their advice. During this, I have learned a lot more about coding and gained specific knowledge in the bathymetry domain.

Besides all this, I have taken several training courses (in total 20+ days) at Esri for free, and had a lot of hands-on experience. I also got the chance to take the internal training course on C++, which helps a lot with my project.



Esri Activities

I spent seven days in total at Esri User Conference 2015, San Diego. Here, I attended one pre-conference session and several conference sessions (three to four sessions each day). It was a great experience: the conference is very inspiring and I feel highly motivated. Frankly speaking, attending the plenary and various conference sessions, as well as seeing how well the conference was organized and staying for the whole seven days, has given me a great sense of pride at being a member of the big Esri family! The seven-day experience is something I treasure. It has given me not only a better understanding of the GIS industry solutions,

but also inspiration and motivation. Thanks to the conference, I have made up my mind to become a GIS expert and choose GIS as my career.

I also took part in the first year of the Esri Intern Hackathon project. I got to know all the summer interns, domestic and international. We gathered together for one day (24 hours), and we were grouped into different teams to work on a project from scratch to the final product. It was great fun and our team made it into the final round and also got the opportunity to present our ideas to different managers.

Conclusion

It has really been an honour and an awesome experience. I have seen people working here with passion and professionalism. I have contributed what I learned at ITC to the project and also to the teamwork at Esri, and in return Esri has provided me with lots of knowledge and experience in the GIS industry. Moreover, I have become friends with many staff here and also have the spare time to travel to Los Angeles, and some national parks and beautiful beaches in California. I have really enjoyed living and working here so far, and believe it will be even more fun and quite unforgettable in the coming months!

Greetings from...

NAME:

Benson Maina

JOB DESCRIPTION:

International Intern at ESRI under the Government Team

PRODUCTS

I've worked on the ESRI products for planners and economic development, including Community Analyst, Business Analyst, CityEngine and ArcGIS online. I now make demos for planners and decision makers that show how GIS can help them to make informed decisions and improve their efficiency.



Products

During this internship, I have been privileged to use ArcGIS Pro, ArcGIS Online and ArcGIS for Server, and Developing Web Apps with GIS API for JavaScript, Esri Maps for Office, Geo-planner, as well as Operations Dashboard for ArcGIS, Collector for ArcGIS, Story Maps, Multidimensional Data, Python and other Custom Apps.

Project Work

My work is focused on meeting client needs by developing ArcGIS platform-based solutions to enhance efficiency in diverse fields, ranging from business, conservation, non-profit, utilities and mining to oil and petroleum industries. Clients explain the problem they need to solve to improve efficiency and cut their costs or, in other cases, to enable a low workforce to accomplish more while still remaining efficient.

Moreover, I have been taken through the process of consultation, and have learnt new skills on how to work as a team, ensure that clients' work is delivered on time, and amicably solve any problems that arise – all reinforced by learning how to write proposals and how to do costing for projects.



Esri Courses and User Conference

Nothing is more exciting than attending the User Conference in San Diego, California, which draws thousands of GIS users and experts from all over the world. I had the golden opportunity to be there for a whole week, and I learnt a lot in applied geography, toured and made new contacts.

A new world of GIS application opened up for me, especially concerning big data. I have undertaken a wide range of courses offered by Esri – these would have taken considerable time and resources if I had had to do them on my own. Most build on the GIS skills I acquired at ITC, and most of those I listed above are new.

Conclusion

This internship is invaluable and this experience cannot be acquired anywhere else! I have had the time to learn by doing, and work with people who have many years of work experience. Consequently, I can use this knowledge and the scientific skills I learnt at ITC to solve complex problems in different disciplines. Interns are valued at Esri and are seen as part of the team.



In addition, it is a good opportunity to explore Los Angeles, San Diego and some of the national parks, as well as make new friends. Esri is multicultural like ITC, and now I have friends from all over the world.

A

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Entrepreneurship and innovation at ITC

Tom Loran

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In the wake of the new vision of the University of Twente, ITC has formulated its own strategic vision for the period 2015-2018. Here it is stated that:

“Entrepreneurship and innovation will be specifically targeted in our new capacity development activities and education programmes. ITC will develop its entrepreneurial core value, and aims to be actively engaged with the private sector and take on the role of gateway (broker) organization, matching the interest of the private sector and societal demands. ITC will actively explore the possibility of contributing to local and regional (small and medium) business development.”

This statement sets the stage for the activities that we will develop both in education and capacity development. We know that several of our alumni are active in the private sector, working either in commercial companies or in their own company. As we are currently brainstorming about what we want to do with respect to entrepreneurship, we would like to get in touch with those of our alumni who are active in the private sector. So, are you working in a private company or have you set up your own business, and are you willing to think together with us about how ITC can strengthen and support this enterprise? Please send an e-mail to Tom Loran (t.m.loran@utwente.nl) explaining what you are doing and how you feel ITC could be of help in this process. ■

We look forward to hearing from you!



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| ✓ Addressing Technology | ✓ Dynamic Mapping | ✓ Image Analysis | ✓ Remote Sensing |
| ✓ Aerial Imagery/Photography | ✓ Earth Observation | ✓ INSPIRE | ✓ Risk Management |
| ✓ Asset Management | ✓ Emergency Services | ✓ Integration | ✓ RTK (Real Time Kinematic) Surveying |
| ✓ Bathymetry | ✓ ENC - Electronic Navigation Chart | ✓ Interoperability & Open Standards | ✓ Satellite Imagery/Navigation |
| ✓ Big Data | ✓ Environmental Monitoring | ✓ Land Information Systems | ✓ Scanning Technology |
| ✓ Business Geographics/ Analytics | ✓ Galileo | ✓ Laser Scanning | ✓ SDI - Spatial Data Infrastructures |
| ✓ Cadastral Mapping | ✓ Geo-ICT | ✓ LBS | ✓ Smart Grids |
| ✓ Cartography | ✓ Geodesy | ✓ LiDAR | ✓ Software |
| ✓ Climate Change | ✓ Georeferencing | ✓ Mapping Software | ✓ Surveying Instrumentation |
| ✓ Computing in the Cloud | ✓ Geosciences | ✓ Marine Tracking & Navigation | ✓ Surveying Technology Sensor |
| ✓ Crime Mapping/ Modelling | ✓ Geospatial Image Processing | ✓ Mobile GIS/Mapping | ✓ Telematics |
| ✓ Data Capture/Collection | ✓ GIS | ✓ Municipal GIS | ✓ Topographic Mapping |
| ✓ DEM- Digital Elevation Model | ✓ GIS in Agriculture & Forestry | ✓ Navigation | ✓ Total Station |
| ✓ DGPS - Differential GPS | ✓ GLONASS | ✓ Network Topology | ✓ Tracking & Route Planning |
| ✓ Digital City Models | ✓ GMES | ✓ NSDI | ✓ Transport |
| ✓ Digital Mapping | ✓ GNSS | ✓ Open GIS | ✓ Utilities GIS |
| ✓ Digital Rights Management | ✓ GPS | ✓ Photogrammetric | ✓ Vehicle Tracking & Navigation |
| ✓ Disaster Management/ Monitoring | ✓ GSDI | ✓ Photogrammetry | ✓ VRS - Virtual Reference Station |
| ✓ DSM - Digital Surface Model | ✓ Hardware | ✓ Point Clouds | ✓ Web Mapping |
| | ✓ Hydrography | ✓ Property Information Systems | |

Sectors covered:

- | | | | |
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| ✓ Aerospace | ✓ Defence | ✓ Healthcare | ✓ Public Safety/Works |
| ✓ Agriculture | ✓ Education | ✓ Infrastructure Protection | ✓ Retail |
| ✓ Archaeology & Heritage | ✓ Emergency Services | ✓ Insurance | ✓ Shipping |
| ✓ Architecture | ✓ Energy Utility | ✓ Manufacturing | ✓ Software Development |
| ✓ Biosecurity | ✓ Engineering | ✓ Marine | ✓ Technical Services |
| ✓ Business Security/Service | ✓ Environmental Management | ✓ Military | ✓ Telecommunications |
| ✓ Central/Local/Regional Government | ✓ Environmental Monitoring | ✓ Mining | ✓ Tourism/Travel |
| ✓ Construction | ✓ Financial Services | ✓ Natural Resource Management | ✓ Training |
| ✓ Consulting Services | ✓ Fisheries | ✓ Oil & Gas | ✓ Transport |
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