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

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# ITC NEWS

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## INSURING SUCCESS



## COUPLED DYNAMICS IN SOIL



## REFRESHER COURSE INDONESIA

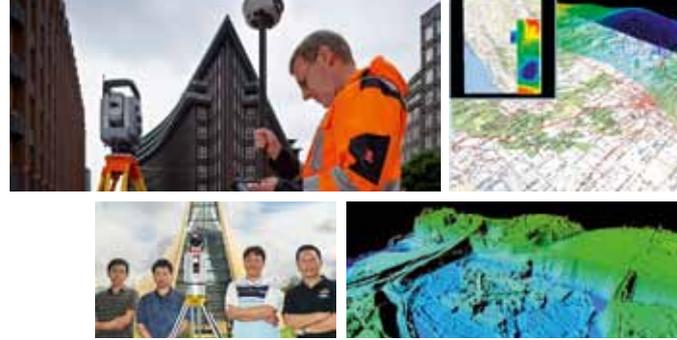


## GREETINGS FROM



# GIM

## INTERNATIONAL



### FACTSHEET

*GIM International* started out as a print magazine in 1986 and soon developed into the multimedia platform it is today, featuring a successful website and respected weekly e-newsletter. In 2012, *GIM International* is celebrating its 25<sup>th</sup> anniversary.

*GIM International* magazine is published twelve times a year, plus a yearly Buyers Guide. The magazine has a worldwide scope and focuses on reporting the latest news and communicating new developments and applications in geomatics. Its main aim is to provide its readership with overarching insight into state-of-the-art developments in geomatics. Its readers are involved in land surveying, GIS, photogrammetry, remote sensing, LBS, Lidar, cartography, GPS/GNSS, cadastres, 3D city modelling and geo-databases.

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Number of Countries	156

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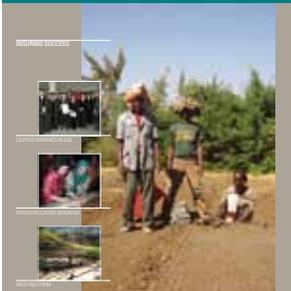
12



17



18



cover

# Content

## ■ MAIN FEATURES

- 3 Understanding Evaporation from Beneath the Soil Surface
- 5 Insuring Success

## ■ EDUCATION NEWS

- 8 Distance Course Guatemala
- 10 Refresher Course Indonesia

## ■ RESEARCH NEWS

- 12 200th PhD Student

## ■ PROJECT NEWS

- 14 TIGER Project

## ■ VISITS

- 15 ITC Directorate Visits Vietnam

## ■ ANNOUNCEMENTS

- 16 Free Subscription ITC News

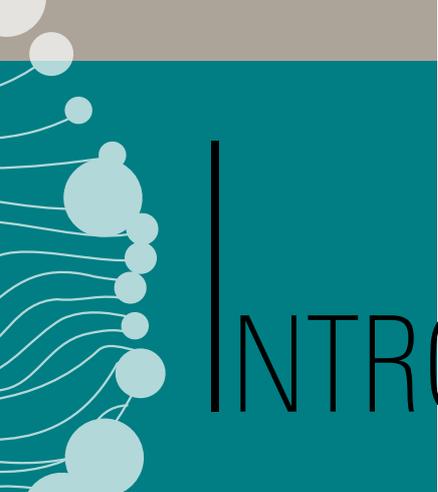
- 17 DELHI 2050

- 18 GREETINGS

## ■ LIFE AFTER ITC

- 19 Best Paper Award
- 20 Letter to the Editor

PhD research whether microinsurance can help alleviate the poverty of Ethiopian farmers (see article on page 5)



# INTRODUCTION

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## colofon

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The views expressed by the contributors  
do not necessarily reflect those of ITC.

Welcome to the new slim-line version of *ITC News*! As ever the Faculty has plenty of news from around the world, but economics is a discipline that plays a serious role even in the world of publication and in this instance means a reduction in size. Further details on such unavoidable changes can be found on page 16.

In view of the new format, you can be sure that we have selected the articles in this issue with particular care. And as ITC's 200th PhD student graduated in February this year with distinction, it's no wonder that research plays a prominent role. You can read more about Dr Yijian Zeng's milestone achievement on page 3, while the article on page 12 includes a brief history of the ITC graduate programme itself and charts the shifting trends.

Many a time this newsletter has included reports of awards won and this issue is no exception. If you turn to page 19, you will discover who carried off the CLIMATE 2011 award for best paper. The author is determined to put the knowledge and expertise gained throughout his studies and professional life to extremely good use, addressing the challenges of poverty and global environmental change.

Distance education creates the opportunity of bringing specialized state-of-the-art knowledge to the door of diverse groups, and the article on page 8 relates the experiences of 15 staff members of the municipality of Guatemala City who graduated last December. Their enthusiasm may well be infectious and, if so, it is worthwhile noting that the nine-week distance course GIS for Urban Planning and Management will be delivered again from 22 October to 21 December 2012 and is open to anyone with a basic knowledge of GIS.

If you wish to track the latest developments in the Delhi 2050 and the TIGER initiatives, these too feature in this issue (pages 17 and 14, respectively). Slim-line it may be, but *ITC News 2012-1* certainly has much of interest to offer its readers. So as always, may we wish you happy and fruitful reading!

Virtually yours,

**Janneke Kalf**  
*Managing Editor*

**Jorien Terlouw**  
*Editor*

# MAIN FEATURES

## Understanding Evaporation from Beneath the Soil Surface

Yijian Zeng

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**T**his PhD project stemmed from a discussion between Professor Bob Su and Professor Li Wan in which they were trying to understand the upward latent heat flux (i.e. evaporation flux) from a satellite image at night. It seems to conflict with conventional knowledge of evaporation, which usually happens during daytime. To understand this apparently conflicting physical process, a preliminary investigation was conducted on a sand dune located in northwestern China. The first result indicated that the coupled dynamics in soil could be the key to understanding this physical process.

To further this study, Professor Bob Su coordinated a joint education framework for funding this PhD project, together with Professor Li Wan from the China University of Geosciences (CUGB), Beijing, and Professor Jun Wen from the Key Laboratory of Land

Surface Process and Climate Change in Cold and Arid Regions, Cold and Arid Regions Environmental and Engineering Research Institute (CAREERI), Chinese Academy of Sciences. With the daily supervision of Professor Bob Su, this project was integrated into the theme "Water Cycle and Climate" ([www.itc.nl/Pub/research-themes/WCC](http://www.itc.nl/Pub/research-themes/WCC)) and entitled Coupled Dynamics in Soil: Understanding the Transport Mechanism of Liquid Water, Water Vapour, Dry Air and Heat by Field Experiments and Numerical Simulation.

### What is the Social Significance?

Evaporation plays a significant hydrological role in understanding the water cycle on Earth. In dry areas, it helps to understand how much rainfall can be maintained in soil and be made available for arid plants and so on. In certain arid areas, evaporation can help in acquiring penetrating knowledge of the relations among precipitation, surface water and groundwater, together with detailed information on the coupled dynamics in soil. It is expected that such knowledge can be used to provide decision makers with scientifically based information for integrated water management, regional adaption to climate change, and so on in arid and semi-arid regions.



On 16 February 2012, ITC PhD student Yijian Zeng successfully defended his PhD thesis

## How does This Project Achieve Its Goals?

The coupled dynamics in soil mean soil water and heat transfer at the same time from one place to another place. More specifically, the movement of soil water is partly dependent on heat transport, and vice versa. To investigate such coupled dynamics, it is necessary to observe soil water content and soil temperature, as well as the atmospheric driving forces at soil surface. And in order to get a closer glimpse into the nature of coupled dynamics in soil, extreme natural environments such as deserts are favoured, where the coupled transfer process is strong.

The Badain Jaran Desert was chosen as the study area because of its unique landscape of co-existing sand dunes and lakes. This unique landscape has become a hot issue, motivating hydrologists to investigate the water cycle in order to understand what the water source for the desert lake is. To discuss this hot issue, it is vital to understand how the coupled dynamics in soil determine the evaporation in the desert – and such was the goal of this project.

Before conducting the experiment in the desert, two experiments were carried out to check how the traditional theory of coupled dynamics in soil could interpret the “reality”. The results indicate that, in addition to water and heat transfer in soil, dry air transfer should be considered. The soil air can convey vapour and heat from one place to another. To describe this “additional” reality, a coupled model was constructed that considered transfer of liquid water, water vapour, dry air and heat at the same time.

The field experiment in the Badain Jaran Desert coordinated by Professor Bob Su proved successful. The detailed measurements of meteorological variables, soil physical variables and the energy fluxes at the surface (e.g. latent heat and sensible heat fluxes) guaranteed the data needed for this theoretical research and the path to achieve the goal of the project.

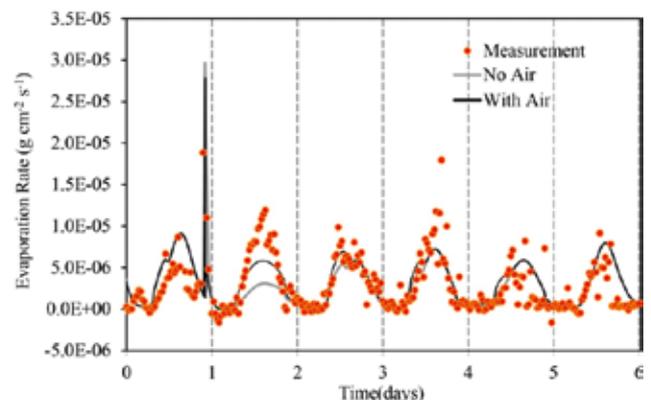


The Badain Jaran Desert was chosen as the study area because of its unique landscape of co-existing sand dunes and lakes

## What is the Result?

In this project, Dr Zeng systematically investigated the classic theory on coupled water and heat transfer in soil, which claimed that vapour transfer in the soil would be enhanced owing to the local air temperature gradient. He identified this vapour enhanced transfer as the key issue to tackle – this was doubted by many researchers because of the difficulties in observing the pore-scale condensation and evaporation processes. Although the enhanced vapour diffusion had been proved to exist in soil, the neglect of vapour convection in the classic theory had been pointed out by many researchers. However, Dr Zeng is the first to tackle this issue by using a two-phase heat and mass transfer model. He pioneered the analysis on how airflow affects surface evaporation and pointed out the necessity of including the airflow mechanism in land surface process studies.

In 2007, with a control sand bunker experiment, he indicated how the thermal or isothermal soil moisture fluxes could alternatively dominate in soil on a daily scale. In 2008, in the field experiment in the Badain Jaran Desert, he assessed how much precipitation evaporated and how much was conserved in the sand. These results can be used to evaluate the water sources for desert plants or lakes. From the analysis of the experiments mentioned above, he realized that the single-phase transport mechanism of the classic theory could not explain the discrepancy between model estimates and field observations of vapour fluxes in the soil. To overcome this, he developed a two-phase heat and mass transfer model to consider vapour transfer with diffusion, advection and dispersion mechanisms (2009). The results show that the newly developed model outperforms the traditional theory in calculating surface evaporation as regards comparison with the field observations (2010). To further explain why the newly developed model is better than the traditional model, he conducted an insightful investigation into the driving forces in the two models and explained the difference between the two models mechanically (2010). Furthermore, in order to understand how a changing climate can affect patterns of evaporation at a regional scale, he combined the newly developed model with a data assimilation technique to retrieve soil moisture and temperature profiles (2011). ■



Comparison of the newly developed model (with air) and the traditional model (no air) in calculating evaporation

To read more about Zeng's research find his full thesis at [www.itc.nl/library/papers\\_2012/phd/yijian.pdf](http://www.itc.nl/library/papers_2012/phd/yijian.pdf)

# Insuring Success

## Twente PhD students carry out field research among Ethiopian farmers

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Source: Universitet Twente.

Photography: Karlijn Morsink

**J**anuary 2012. While the Netherlands, over-insured as always, sulks about the recession, Karlijn Morsink flies to Addis Ababa. She wants to investigate whether microinsurance can help alleviate the poverty of Ethiopian farmers. "Everyone has an opinion on what we should do about poverty, but it is imperative to research what works best so that we do not waste money."

Karlijn spots the Horn of Africa – the scene of famine in 2011 - appearing 30,000 feet beneath her. Her final destination is Tigray, a region in northern Ethiopia. Fellow researcher Tagel Gebrehiwot Gidey has travelled on ahead. Students from the regional capital Mek'ele will assist them.

Karlijn and Tagel want to find out how local farmers are dealing with the threat of drought, food shortages and persistent or worsening poverty. Microinsurance may be instrumental in removing some of the risks that are currently preventing farmers from pro-active investment. For them, being sure of a small yield outweighs the danger of no yield at all.

Using research techniques borrowed from psychology and economics, they will spend the next few weeks collecting data. Before she left home, Karlijn packed everything she would need: hundreds of dice, chips and pencils. And pocket money to compensate the farmers for the time spent away from their fields.

### Sample

Of course Tagel and Karlijn ran a pilot among Ethiopian students in the Netherlands. But here in Tigray, the subjects have enjoyed little education or are even illiterate. So how will they respond to the games? What will 'risk preferences' or 'annual schedules' mean to them? And - the biggest fear of all - will they even show up?

The experimental nature of this study necessitated a random sample. Over 200 male and female candidates were selected from villages far and wide. Development agencies, village councils, local insurers, all have their own opinion about the project. That is why it took months to prepare for this study. Understanding local culture and cooperating with all parties concerned are essential for sound research findings and imperative when organizing follow-up studies. So it's a good thing that Tagel was born and raised in Tigray!



"Developing countries are not a testing ground for just trying out all kinds of schemes."

**Karlijn Morsink** (centre, right) is a PhD student at the Institute for Innovation and Governance Studies (IGS). Her research focuses on the role of context factors on demand for microinsurance by low income households in developing countries and its impact on these households. She is also an insurance advisor for the Dutch Ministry of Foreign Affairs.

**Tagel Gebrehiwot Gidey** (right) is a PhD student at the Faculty of Geo-Information Science and Earth Observation (ITC). His research focuses on assessing the effect of policy interventions targeted at vulnerability reduction and food security. Recently, agricultural insurance has become a subject of academic interest as a potential policy intervention.

Both Tagel and Karlijn are members of an IGS working group on microinsurance for development that also includes Professor Anne van der Veen, Dr Peter Geurts and Dr Kees de Bie. Besides the research project in Ethiopia, another activity of this working group is the exploration of the use of satellite data for supporting agricultural insurance.



### Serious game

The team of economics students is also local and although no stranger to working with surveys for universities and international organizations, this is an opportunity not to be missed. They can practice what they have been taught on people who could even be their grandparents. You do not just dictate 'how it should be done' but you have to put them at ease first, however tight the schedule. This is a serious game you are playing with them: the dice roll, with white standing for secure earnings and red for uncertain profit – or loss. Chips representing insurance payouts are put on the table (although a stone floor or public road will also suffice). And notes of ten, twenty or a hundred birr add to the seriousness and credibility of the game.

### Egg or chicken

From father to son, these farmers grow teff, wheat and barley. Barley, largely grown for local consumption, is more resistant to drought than wheat or teff. But if it rains, wheat and teff are much more lucrative. An older man is asked whether he intends to invest in higher quality seeds and fertilizer. His resolute answer, "Better an egg today than a hen in a week", expresses the fear of losing what little he has. To which the interviewer replies: "Now suppose that a microinsurance policy covers your investment in the event of drought. Would you choose differently?"

### Trust

In the Netherlands, a plethora of insurance policies covers virtually any eventuality. We also know that the system works, and we are confident that if something does go wrong, we can do something about it. But for Tigreans, 'taking out insurance' is a risk in itself. For a sustainable insurance market, the first lesson is to build trust. Karlijn is aware that any insurance product that does not live up to the promise made to the farmer will only evoke resentment and wariness of insurance. "Developing countries are not a testing ground for just trying out all kinds of schemes."



### INVESTING IN INVESTORS

Economics offers no clear-cut theory on how to escape poverty. Some economists believe in the existence of poverty traps that people can fall into, while other economists do not. There is consensus, however, on the importance of opportunities for investments. The yield on these investments means that a person's future income can increase compared with current earnings. A small degree of capital is needed for investment, as is some assurance that the investment will be repaid – preferably with a little profit. Particularly poor people are affected the most by natural disasters, drought, health problems and mortality. The higher these risks, the less inclined people are to invest. Microinsurance can contribute to the development of the poor by covering the risk posed by potential misfortune. In turn this can lead to a greater willingness to invest.

### Narrow margins

"After the 1984 famine and recurrent periods of severe drought, people are now attempting to recover," Tagel remarks. His country now needs to explore the narrow margins between uncertainty and freedom. What circumstances will cause households to recoil from innovations, and when is a little security enough to help people escape the poverty trap (such as in a tabia where investments have helped an entire village back on their feet)? Apparently, it can be done, but what exactly are the deciding factors?

"Testing variations on insurance products is a new approach," Karlijn says. "Normally, a product is simply developed and put on the market in the hope that it will catch on. But what we are doing involves introducing small adjustments to the products. This way people can decide for themselves which product is the most appropriate for them personally." ■



### PRINCESS MÁXIMA OPENED THE FIRST RESEARCH CONFERENCE ON MICROINSURANCE

On Wednesday 11 April, the University of Twente hosted the first research conference on microinsurance. The UT was delighted that Her Royal Highness Princess Máxima of the Netherlands visited the campus and attended the conference.

The conference is organized by the Institute for Innovation and Governance Studies, a research institute of the University of Twente, in cooperation with the Dutch Ministry of Foreign Affairs as well as various international (research) institutes in the field of microfinance.

Pictures and a video can be found at [www.utwente.nl/en/archive/2012/04](http://www.utwente.nl/en/archive/2012/04)



# EDUCATION NEWS

## Distance Course Geographical Information for Urban Planning and Management: Graduation of Guatemalan Municipality Staff

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**Last December, the** municipality of Guatemala City celebrated the graduation of 15 staff members who had completed a number of ITC distance courses. The ceremony was attended by the mayor, the heads of departments, colleagues, friends and family members.

These professionals involved in urban planning – most of whom were architects and engineers – followed a distance programme that consisted of three ITC core modules on GIS, earth observation and databases. A fourth module specially designed for the staff of Guatemalan municipality was added: GIS for Urban Planning and Management. Given for the first time as an online course, it gave an overview of a range of application areas for GIS for urban planning and management. This module in particular was perceived to be highly interesting and practical, and gave a good impression of what GIS can offer when it comes to urban planning at the local level. The entire course was seen as useful to the public officials in their future tasks in coping with the rapid urban growth of the city and its surrounding area.

At the municipality, it was a new experience for a group of young professionals working in departments related to urban planning to acquire such specialized state-of-the-art knowledge. Despite the novelty,

Graduates of the distance course, together with the mayor and coordinator of the Institute for Urban Management, Municipality of Guatemala





The mayor addressing the graduates of the distance course

and the intensive work and hard study alongside regular duties (including additional tasks during the municipal elections), the whole group looks back on the course as a successful event.

Together the four modules form the first block of the Postgraduate Diploma and MSc course Urban Planning and Management (UPM) at ITC. The students who were successful in all four modules are eligible to continue with the full MSc course in urban planning and management. Not all the necessary preparations could be completed in time to allow these students to continue immediately with the course at ITC in the Netherlands, but they are expected to be able to continue with their studies in the coming academic year. Sufficient preparation time is essential, bearing in mind the personal impact of being absent from home for an extended period and that staff who will be physically absent during their studies at ITC need to be replaced. This period also gives us sufficient time to work out further staff development and training policies, such as optimal selection of students, effective application of the new knowledge, and the search for and allocation of financial resources.

This whole exercise fits within the initial framework of possible broader cooperation between Guatemala City and ITC.

We would like to thank ITC for this excellent form of cooperation, for the shared thinking with us, and for tailoring this course to our needs. We are working on further plans and look forward to the next step in our cooperation – also with local universities – to realize our ambitions. ■

The distance course GIS for Urban Planning and Management will be delivered again by ITC from 22 October to 21 December 2012 (nine weeks; 5 ECTS). The course is open to anyone with a basic knowledge of GIS. For details and application, see [www.itc.nl/CourseFinder](http://www.itc.nl/CourseFinder)

# Refresher Course: Mainstreaming Disaster Risk Reduction into Spatial Regional Planning

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**On request of** the Agency for the Assessment and Application of Technology (BPPT), Jakarta, a refresher course was organized at the Faculty of Engineering, Department of Geodetic and Geomatic Engineering, Gadjah Mada University, Yogyakarta. The overall aim of the course was to integrate a multidisciplinary assessment of disaster risk into strategic planning processes using up-to-date geospatial tools and techniques.

Disaster risk management involves the assessment and mapping of hazards, the identification of the elements at risk and their vulnerability to a specific hazard, risk zoning, and the formulation of risk-reducing measures. Various tools and approaches can be used to support these activities.

According to the Indonesian National Disaster Management Plan (NDMP) of 2009, disaster risk reduction programmes will need to be integrated into development plans at the central and local level. In this way, risk reduction programmes and activities will not stand alone but will be mainstreamed into regular development programmes. It is expected that this strategy will help to realize risk-sensitive developments and a resilient community.

The refresher course focused on earthquake and volcanic risk assessment within the context of regional spatial planning. Use was made of data collected concerning the Mt Merapi volcanic eruptions of 2006 and 2010 and the earthquake within the Yogyakarta area of 2006. Lectures and hands-on computer exercises were given by ITC staff and invited guest lecturers from Indonesia on the use of high-resolution remote sensing images and GIS, including spatial multicriteria analysis for disaster risk management. The Australian-Indonesian Facility for Disaster Reduction (AIFDR) demonstrated the online software tool Risk-In-A-Box. Dr Trias Aditya and his staff organized a two-day field visit to the earthquake-damaged areas in Bantul and the disaster area on the slopes of the Merapi volcano. They showed us various

aspects of the rehabilitation process within the disaster area. In Desa Jatimulya, the participants visited a participatory hazard and risk mapping project and discussed the impact of the earthquake with local members of the post-disaster rehabilitation project. The participants enjoyed the exhibition in the office of the vulcanological survey in Yogya, which showed three-dimensional models of the volcano and the data recording and analysis for early warning.

In total 25 participants from nine organizations in Indonesia dealing with disaster risk participated in the course. The training approach was based on the extensive experience of the ITC trainers involved, in consultation with staff of BPPT and the UGM Faculty of Engineering. Theoretical lectures alternated with hands-on computer exercises, field visits to disaster areas, group discussions on best practices, and project work on hazard, vulnerability and risk assessment methods in Indonesia. The ITC input was supplemented by local guest lecturers, who gave examples of research and disaster management in Indonesia in general and in the Yogyakarta area in particular. During the morning of the last day of the course, the participants presented the results of the group work on (a) hazard assessment and mapping, (b) vulnerability assessment and mapping, and (c) risk-reducing methods. This was followed by a lively discussion.

At the end of the course, all 25 participants received a UT-ITC Certificate of Attendance, which was presented by the dean of

ITC, Professor Tom Veldkamp. They were also given a DVD with all the course materials and software used.

All participants considered the course to be in general a success, and agreed on the usefulness of the training in their own work in education, research and consulting. It was proposed to organize a Disaster Risk Management Network for Indonesia via the internet in order to stay in touch with one another, disseminate information on activities, and develop new ideas. It will also be possible to invite interested persons from "outside" to participate in this network. The courseware developed for the STUNED refresher course can be used by teaching staff of the joint education programme Geo-information for Spatial Planning & Risk Management at Fakultas Geografi, UGM, in Indonesia, as well as at ITC (course Natural Hazards & Disaster Risk Management and the Certificate course Risk Management and Strategic Environmental Assessment for Spatial Planning).

As mentioned in the previous *ITC News*, an alumni meeting was organized at the Sultan Palace in Yogya, where around 70 alumni from all over Indonesia enjoyed a delicious dinner and a slide show illustrating how ITC staff and Indonesian students had worked together over the last 30 years. Anticipating the farewell of Pak Voskuil, who had initiated the well-known N4 course, a special batik painting had been arranged, on which everyone added their signature.

As a spin-off from this refresher course, a similar refresher course will take place in September 2012 in Manado, focusing on alumni from the Eastern Provinces. This course is being organized in cooperation with the Sam Ratulangi University (UNSRAT) in Manado and again with BPPT. More information can be found at [www.itc.nl/C12-NRS-RC-02](http://www.itc.nl/C12-NRS-RC-02).



Dr Trias Aditya and his staff organized a two-day field visit to the earthquake-damaged areas in Bantul and the disaster area on the slopes of the Merapi volcano.

Possibilities for research were also explored, such as the development of a pilot project in Indonesia on the use of distributed sensor networks for hazard monitoring. The MESA+ Lab of the University of Twente (nanotechnology) will be asked to participate in this project and to design dedicated sensors on chips. ■



Anticipating the farewell of Pak Voskuil, who had initiated the well-known N4 course, a special batik painting had been arranged, on which everyone added their signature.

All the participants of the refresher course



# RESEARCH NEWS

## ITC'S 200th PhD Student Graduates with Distinction

Paul van Dijk

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On 16 February 2012, Yijian Zeng defended his PhD thesis *Coupled Dynamics in Soil: Understanding the Transport Mechanisms of Liquid Water, Water Vapor, Air Pressure and Heat by Field Experiments and Numerical Simulation*. He received his doctor's degree with distinction – *cum laude*.

### Dr Yijian Zeng

Dr Yijian Zeng became a PhD student at the ITC Faculty of the University of Twente under a joint cooperation project supported by ITC, the China University of Geosciences (CUGB), Beijing, and the Cold and Arid Regions Environmental and Engineering Research Institute (CAREERI), China Academy of Sciences. His study focused on understanding coupled mechanisms in soil, using field observations and numerical simulations. In 2007, with a control sand bunker experiment, he indicated how the thermal or isothermal soil moisture fluxes could alternatively dominate in soil on a daily scale. In 2008, he designed and conducted a field experiment in the Badain Jaran Desert in northwestern China. Through detailed observation of micrometeorological and soil physical parameters, he assessed how much precipitation evaporated and how much was conserved in the sand. This assessment could then be used to evaluate the water sources for desert plants.

Analysing the experiments mentioned above, he realized that the single-phase transport mechanism of the classic theory could not explain the discrepancy between model estimates and field observations of the vapour fluxes in soil. To overcome this,



Bijschrift: Dr Yijian Zeng (middle) accompanied by his paranymphs Alain Pascal Frances (left) and Enrico Balugani (right)

he developed a two-phase heat and mass transport model to consider vapour transport with diffusion, advection and dispersion mechanisms (2009). The results show that the newly developed model outperforms the traditional theory in calculating surface evaporation as regards comparison with the field observations (2010). To further explain why the newly developed model is better than the traditional model, he conducted an insightful investigation into the driving forces in the two models and explained the difference between the two models mechanically (2010). Furthermore, in order to understand how a chang-

ing climate can affect patterns of evaporation at a regional scale, he combined the newly developed model with data assimilation techniques to retrieve soil moisture and temperature profiles (2011). His research resulted in a doctor's degree with distinction – *cum laude* – and so Yijian Zeng became the first ITC PhD to graduate with distinction from a Dutch university.

### Brief History of the ITC Graduate Programme

Over the years, the ITC graduate (PhD) programme has provided fertile ground for the research aspirations in geo-information science and earth observation at ITC. The

programme operates under the guidance of ITC's professors, who take responsibility for its quality, coherence, and focus on development-related issues. From a modest start in the early 1990s, the graduate programme has developed into one of the largest core activities at ITC. The increase in volume reflects not only ITC's ambition but also the demand of our target group (traditionally mid-career professionals and increasingly fresh graduates). The last three decades have indicated a shift from postgraduate to Master of Science and increasingly to PhD-level education, reflecting the desired academic qualification of our target group in developing countries, such that in 2012 the students registered in the graduate programme outnumber the ITC MSc student population in Enschede (not counting the joint education programme). Moreover, non-degree courses are given in target countries, and with the advent of distance learning the courses are becoming more location-independent.

Figure 1 shows the number of graduates per year. The graduate programme started with <5 graduations/year from 1990 to 1995, had a stable phase of around 10 graduations/year from 1996 to 2007, and shows a steep increase after joining the University of Twente in 2010. The two years with somewhat lower graduation numbers (2008-2009) can be interpreted as a result of the lower enrolment figures around the year 2003 (as shown in Figure 2). This was due, among other things, to a reduction in NFP PhD fellowships. Figure 2 also shows the low number of AiOs (research assistants) throughout the years, and the sharp increase in enrolment after 2005 owing to investment from the ITC Research Fund and the arrival of Erasmus Mundus PhDs. What is not visible is the presence of a number of staff PhDs in the first ten years of the record, whereas after 2000 staff PhDs were obtained only sporadically (because recruited research staff already held a PhD).

Figure 3 shows the growing quantity of academic output in the years from 2007 onwards. Although no distinction is made regarding publications (co-)authored by PhD candidates and no account is given of the lead time it takes for PhDs to start publishing (usually in the second or third year of their track), it can still be seen that the scientific output of ITC as a whole is steeply rising with the increase in the number of graduate students. The right conclusion would be that the entire ITC research community, composed of professors, associate and assistant professors, as well as PhD candidates, has come to fruition. This was confirmed in 2010 by the research assessment committee that evaluated ITC's research according to the standard evaluation protocol 2009-2015 of the Royal Dutch Academy of Science, the national funding agency and the association of Dutch universities (KNAW-NWO-VSNU). The verdict on ITC as a whole was a score of 4x4 (on a scale of 1 to 5) for the criteria Quality, Productivity, Societal Relevance, Vitality and Feasibility. All in all, one can say that, from a research perspective, ITC was well prepared to become a faculty of the University of Twente, and can continue to build on a well-established international reputation. One aspect that stands out is that on average some 40% of all publications (up to a maximum of two/three per department) are co-authored by affiliates from developing countries. ■

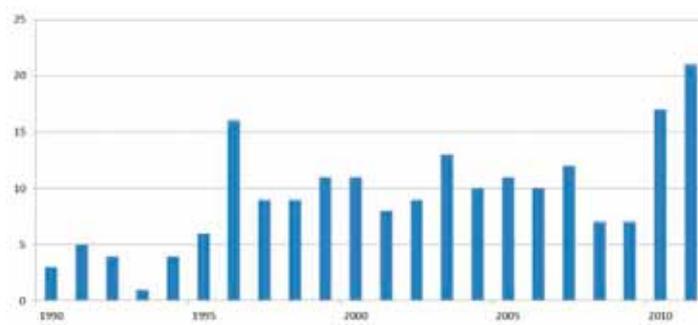


Figure 1 Enrolment in ITC graduate programme 1990-2011

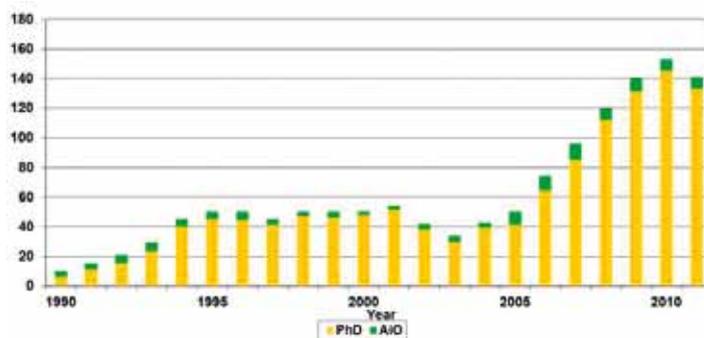


Figure 2 Number of ITC PhD graduates per year 1990-2011

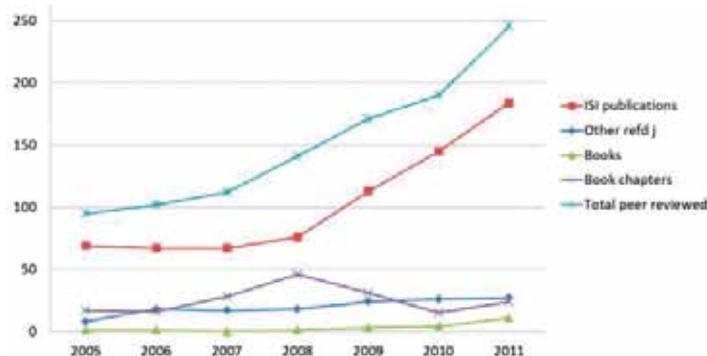


Figure 3 Number of publications 2005-2011

# P PROJECT NEWS

## Earth Observation Empowers African Scientists to Improve Water Management Satellite Data for Irrigation

Source: European Space Agency (ESA)

**With many African** countries suffering from a lack of water, ESA's TIGER initiative has built capacity to map this precious resource. This new knowledge is making a practical difference and paving the way to sustainable water management practices.

Agriculture in Morocco's Doukkala region is of great importance for national food production. However, increasing numbers of droughts are limiting the supply of water and affecting productivity – a typical issue in many parts of Africa. Addressing this issue, scientists at a local university have developed a system that uses satellite data to estimate the amount of water actually needed by crops. The resulting maps are proving instrumental in optimizing the use of scarce water resources for irrigation, thus protecting the farmers from losing their harvests to drought.

This is just one of the findings presented at the TIGER workshop organized under the contract with the European Space Agency (ESA) by the TIGER Capacity Building Facility / Faculty of Geo-Information Science and Earth Observation of the University of Twente (ITC).

In Senegal, Lake Guiers is the country's main source of freshwater, fulfilling almost 40% of the daily needs in the Dakar region. Monitoring and protecting this body of water is a high priority. Scientists from the Cheikh Anta Diop University in Dakar used datasets from ESA's Envisat satellite to generate monthly maps of chlorophyll concentration, dissolved organic matter and suspended matter over a ten-year period. This kind of monitoring system means that pollution and eutrophication (where excess nutrients build up in the water) can be detected.

"The transfer of these scientific developments into operations would be very valuable in supporting our new office in monitoring the condition of Lake Guiers," said Birane Ndiaye Dièye, director-general of the Lake Guiers Office, which is part of the national water authority in Senegal.



The forum was open to African and international participants. All institutions involved in the execution of the TIGER Capacity Building Facility were present

A training course on the management of water resources and the modelling of evapotranspiration was also held in collaboration with the South African Space Agency and national water authorities. Further regional technical centres and universities were trained in the use of ESA's system to deliver data via telecommunication satellites directly to African users. This helps to bridge the digital divide owing to slow internet connections in parts of Africa.

The research conducted by Professor Kamal Labbassi, head of the Remote Sensing Group at the University Chouaib Doukkali in Morocco, who was one of the first participants in the TIGER initiative, is a clear success. "With its training and capacity building, the TIGER initiative was instrumental in starting earth observation as a new science at my university," said Professor Labbassi. "Our recent results on monitoring crop water requirements are now being considered by national water authorities for use in ensuring more efficient irrigation and regional agricultural productivity." ■

**More information** [www.itc.nl/tiger/phase2/workshop2011.asp](http://www.itc.nl/tiger/phase2/workshop2011.asp)

# VISITS

## ITC Directorate Visits Vietnam

Paul Schoonackers

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**Within the framework** of ITC's country strategy, our dean and managing director recently visited Vietnam. ITC already has a solid position in Vietnam but the fact that the country is quickly going through a transition phase to become a middle-income country offers many new opportunities for cooperation. Our management wanted to assess this promising situation on the spot.

The visit took place from 16 to 24 March 2012. To obtain a good overview, the team first visited various partners in Hanoi and then transferred to Ho Chi Minh City. There is a distinct difference between these two cities and parts of the country. The programme itself was a mix of visits to university partners and government partners.

In Hanoi, we had meetings with the management of the Vietnam National University Hanoi and the Hanoi University of Mining and Geology. With both these universities, we have set up joint MSc courses on land administration and on applied earth sciences, respectively. Discussions focused on how to make and keep these joint education programmes sustainable. We also visited the Water Resources University to discuss our involvement in a large NICHE project in which ITC is responsible for establishing an MSc course in disaster management. In government circles, we visited the National Remote Sensing Centre to discuss their urgent need for applications in various fields. A crucial visit was to the Ministry of Education and Training to be informed about the Vietnam International Education Development (VIED) initiative. This is a fund that will dispense 23,000 PhD fellowships in the period 2012-2020! To gauge the business perspective, we had a meeting with ESRI Vietnam. Finally, in Hanoi we visited the embassy to learn about the Dutch priorities in Vietnam: the focus will be on the water sector.

A welcome break in the formal visits was a dinner with our Vietnamese alumni. This was impeccably organized by Dang Thuy Linh. A total of 25 alumni attended the gathering. It was nice to see the mix of young and old alumni. Overall conclusion: ITC is very much alive in Vietnam.

In Ho Chi Minh City, we were invited by the Ho Chi Minh University of Technology to discuss the possibilities for cooperation. This university already has an MSc course in GIS and a well-known GIS centre, primarily for consulting projects. The university is very keen to establish a formal link and cooperation with us. We concluded our trip to Vietnam with a visit to the Netherlands Education Support Office.

Without wishing to pre-empt the formal strategy emanating from this visit, it is fair to say that our management obtained a very favourable view of Vietnam as a partner country for ITC. There are definitely many interesting opportunities to enlarge our cooperation with Vietnam. ■



Alumni dinner organized by Dang Thuy Linh

# ANNOUNCEMENTS

## Your Free Subscription to *ITC News*

**Owing to the** growing number of free subscriptions to *ITC News* magazine, we have been forced to reduce the production and mailing costs. As a result we have pruned our mailing list.

As an alumnus/alumna you will receive a printed copy of *ITC News* for a period of ten years. If you graduated more than ten years ago or if your automatic subscription is due to expire after ten years, you can renew your subscription by sending an e-mail to the alumni coordinator at [alumni@itc.nl](mailto:alumni@itc.nl).

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Editorial team *ITC News* ■

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# ITC Contributes to DELHI 2050 at 5th IAB Opening on 19 April 2012

Richard Sliuzas

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**Over the last** six months, several staff and PhD students of the PGM department have been contributing to the DELHI 2050 initiative, a Dutch-Indian partnership involving government agencies, architects, engineers, academics and NGOs from both countries [www.delhi2050.com/index.html](http://www.delhi2050.com/index.html).

A series of joint workshops and activities in the Netherlands and in Delhi were used to discuss the development challenges facing Delhi over the next four decades and to exchange ideas for possible responses. The discussions concerned city-wide strategic planning and development as well as adaptation at local level. As regards the latter, the partners' focus was on the Dwarka area, to the west of Delhi International Airport, and the historic Kashmere Gate quarters in Old Delhi.

The International Architecture Biennale Rotterdam ([www.iabr.nl/EN/making\\_city/](http://www.iabr.nl/EN/making_city/)) has the theme Making City and will feature the cities of São Paulo, Istanbul and Rotterdam. The products of the Delhi 2050 initiative will be displayed along with presentations from several other cities, from such countries as Belgium, France, USA, Switzerland, Guatemala, Indonesia, Italy, Turkey and Egypt. ■

Those with an interest in architecture and planning can visit the exhibition at the Netherlands Architecture Institute (NAI), Museumpark 25, 3015 CB Rotterdam (telephone: +31 10 4401200; e-mail [service@nai.nl](mailto:service@nai.nl); website: [www.nai.nl](http://www.nai.nl)).



Gurgaon, a satellite town of Delhi (taken by Divyani Kohli, PhD student)

# Greetings from...

NAME: Tom Loran

**JOB DESCRIPTION:** acquisition and guidance of externally funded activities in Indonesia; this includes also the organization and management of cooperation in education and research with Indonesian universities.

**WORKS ON:** negotiations for funding of the National Geothermal Capacity Building Programme in Indonesia; accompanying a delegation of the President of the UT to visit a number of Ministries and Universities in Jakarta and Bandung (and the graduation ceremony of Double Degree students in Yogyakarta).



There was a two-day workshop at ITB in Bandung on capacity building for the development of geothermal energy in Indonesia. I gave a presentation on capacity building principles and good practice. ITC is involved in the preparation of a big project to set up a national capacity building programme. Later in the week, a meeting is scheduled at the Netherlands embassy in Jakarta to discuss funding opportunities for the project.



On Monday I visited the Indonesian Ministry of Education. The Ministry is preparing guidelines for the development and implementation of joint education activities between Indonesian and foreign universities. As part of my sabbatical, I am preparing blueprint working guidelines that can be used in preparing double and joint degree programmes.

I attended a meeting in Yogyakarta on Thursday at the UGM Faculty of Geography. The faculty is a long-term partner of ITC (since the 1970s) and is host to one of our double degree programmes. We are now discussing ways to extend the cooperation into other subject areas. The main point of discussion is whether this can be done in a creative way, for example linking up with themes such as climate change or integrating with environmental impact assessment, risk and hazards, and spatial planning.



There were two information sessions (in Jakarta and in Bandung) for prospective students for ITC and the UT, when information was provided on courses, application procedures and on studying and living in the Netherlands. The sessions were each attended by some 35 people, and were organized by Atlas Education Services and European Higher Education Office, the two agents with whom we are working in Indonesia.

# LIFE AFTER ITC

## Best Paper Award for Alumnus Medani Bhandari

Medani Bhandari

mbhandar@maxwell.syr.edu

**How do** India, Nepal, Bangladesh and Pakistan engage in addressing environmental severity induced by climate change? ITC alumnus Medani Bhandari uses a global and regional comparative matrix in his award-winning paper.

CLIMATE 2011 presented this year's award to Mr Medani P. Bhandari from Syracuse University, USA, for his paper "Environmental performance and vulnerability to climate change: a case study of India, Nepal, Bangladesh and Pakistan".

Medani earned his degree in Environmental Systems Analysis and Monitoring at ITC in 1998. Since then he has led a very active academic and professional life, has served extensively as a research and professional consultant, and has played a leadership role in international NGOs. He has gained expertise in the full range of interwoven academic fields and subfields of sustainable development, environment conservation and climate change, including national and international environmental policy formation, and has written over 45 professional publications, ranging from journal articles and research reports to books in these fields. He will graduate with a doctoral degree in Sociology from the Maxwell School of Citizenship and Public Affairs of Syracuse University in May 2012.

Medani wants to use his scientific and cultural knowledge and research management skills, as well as his extensive experience in natural resource management

(with a focus on forest and protected areas) and global organizational management, to foster social justice and empowerment in order to address poverty and the challenges of global environmental change, with a focus on biodiversity, climate change, international issues regarding water, and land degradation. Specifically, he wants to cultivate a multi-disciplinary knowledge-based network to minimize conflict over natural resources, and catalyse action across the global community for a sustainable world by changing public attitudes to global climate change, increasing public awareness of North-South differences and tensions, and analysing risk, policy and behaviour.

### Abstract

Relatively little scholarly work has focused on the comparative evaluation of the environmental performance of South Asian countries in addressing issues of vulnerability to climate change. It is an accepted fact that problems induced by climate change in South Asia have been increasing over many years, but their effects have largely been blamed on extreme poverty and uncontrolled population growth. Scholarly works and government reports indicate that the countries individually and



Mr Medani P. Bhandari

collectively are aware of the severity of climate change impacts and have taken some initiatives aimed at adaptation and mitigation. However, it is still unknown how effective these initiatives are and how they are being implemented. This research broadly examines the environmental performance of these countries by modelling a comparative matrix in both the global and the regional context. The author is interested in how India, Nepal, Bangladesh and Pakistan actually engage in addressing environmental severity induced by climate change. This research utilizes various years of data from the public domain (e.g. Environmental Sustainability Index and Environmental Performance Index). Environ-

mental performance is presented within the framework of comparative scores on (1) environmental burden of disease, (2) water resources for human health, (3) air quality for human health, (4) air quality for ecosystems, (5) water resources for ecosystems, (6) biodiversity and habitat, (7) forestry, (8) fisheries, (9) agriculture, and (10) climate change. The specific findings of this research will reflect on the efforts of the respective countries and also provide an opportunity to evaluate the cause of success or failure. ■

The full text of *“Environmental performance and vulnerability to climate change: a case study of India, Nepal, Bangladesh and Pakistan”* is available at [www.climate2011.net/en/papers/1/33](http://www.climate2011.net/en/papers/1/33)

## Letter to the editor

**Dear Editor,**

I am Sunil Fernando from Sri Lanka who followed cartographic technician’s course in February 1974. Also I am a life member of the Netherlands Alumni Association of Sri Lanka since 1975. The benefits I received from following the above course are immense. After completing the one year course in eleven months, the staff of cartography appreciated my performance and awarded excellent grading for the final project and for the design. After returning to my motherland I was awarded the post of map production officer of the department I worked for, subsequently I was made the local counterpart for all foreign funded projects on mapping conducted by the World Bank, CIDA, Norad and Jica. All my outputs were highly appreciated by the respective project directors and the director of my department too.

Due to my experience gathered in soil and land use mapping over a period of 20 years, I was selected as a UN volunteer specialist for a solid mapping project in Botswana in 1988. Later in 1992 the project made me a FAO cartography consultant. On my return to Sri Lanka I was selected as a national consultant in cartography for landslide hazard mapping project conducted by UNCHS project. After serving the project for three years I joined the National Hydrographic Office of Sri Lanka as a chief cartographer / consultant cartographer where I headed the Nautical Chart Preparation Unit. As you can see all these fields differ from one another. The secret behind my success is the vast knowledge I gathered from studying at ITC.

Finally I left Public Service after working as the secretary / administrative assistant of DEOCOM project conducted by the Ministries of Foreign Affairs and Fisheries. Presently I work as a freelancer. At the ripe old age of 74 years I am leading a peaceful life. I suppose my SUCCESS STORY SHOULD BE AN EYE OPENER FOR ALL PRESENT AND FUTURE ITC STUDENTS. I owe my success to Professor Ormeling sr. and all the old staff who are living and deceased and worked at the cartography department in 1974.

Yours Sincerely,

Sunil Fernando  
sunilf04@yahoo.com  
ITC Alumnus 1974 ■



Sunil Fernando  
ITC Alumnus 1974

MAPPING

Photogrammetry

Plant design

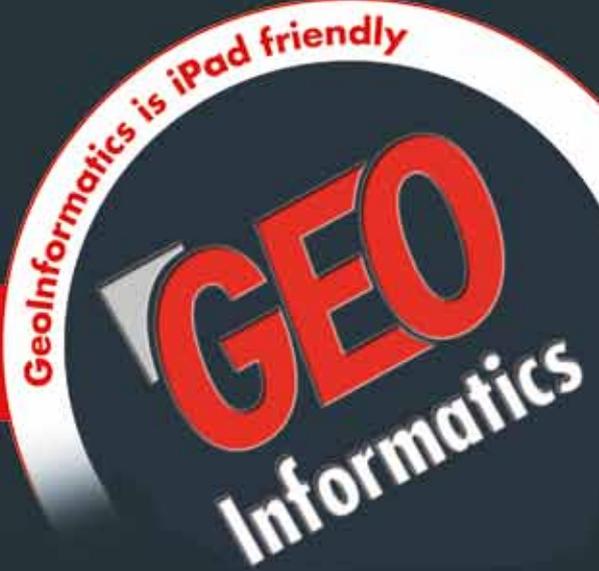
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