





01-10-1859
NORWEGIAN COLLEGE OF
AGRICULTURE ESTABLISHED



01-10-1909
50- YEAR ANNIVERSARY



06-10-1926
FIRST HONORARY DOCTORATE
BESTOWED UPON DR. LAURI
KRISTIAN RELANDER (FINLAND)



09-11-1949
HONORARY DOCTORATE BESTOWED
UPON LORD JOHN BOYD ORR, U.K.,
(RECIPIENT OF NOBEL PEACE PRIZE
IN 1949)



01-10-1959
100-YEAR ANNIVERSARY



20-08-1970
DR. NORMAN E. BORLAUG RECEIVES
HONORARY DOCTORATE (RECIPIENT
OF NOBEL PEACE PRIZE IN 1970)



19-09-1997
DR. WANGARI MAATHAI RECEIVES
HONORARY DOCTORATE (RECIPIENT
OF NOBEL PEACE PRIZE IN 2004)



01-01-2005
THE NORWEGIAN UNIVERSITY OF
LIFE SCIENCES IS ESTABLISHED

THE NORWEGIAN UNIVERSITY OF LIFE SCIENCES – UMB

Founded in 1859 as the only Norwegian agricultural post-graduate college, the Norwegian University of Life Sciences (UMB) is now recognised as a leading international centre of knowledge, focused on higher education and research within environmental- and bio-sciences. UMB focuses specifically on biology, food, environment, land- and natural resource management. Together with other research institutes established at Aas, UMB provides state-of-the-art knowledge based on a broad range of disciplines.

The university's central activities have evolved from purely agriculture and animal husbandry some 150 years ago to a broad range of subjects in demand by modern society these days. UMB's development is reflected in the university's symbol (biogramme), which changes each day as it passes into a new cycle. This is most likely the world's only "living symbol"!

This brochure contains some examples of research and



education carried out at the Norwegian University of Life Sciences. Come and visit us soon!

Professor Knut Hove
Rector



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COVER PHOTO: KECMEC



EDUCATION

The Norwegian University of Life Sciences (UMB) provides educational programmes in areas such as biology, food science, environmental science, land use and natural resource management, aesthetics and technology.

In its educational programmes, UMB emphasises the combination of theory and practical experience. About 30% of our students study abroad at one of the numerous universities with which UMB has exchange agreements.

UMB aims to maintain an excellent quality of its study programmes. Our goal is to ensure a high level of academic standard and to promote student welfare.

The Centre for Continuing Education (SEVU) arranges numerous courses within the scope of UMB's scientific expertise.

2006 IN FIGURES

- Applications to study programmes: 10,500
- Primary applicants: 2,600
- Student enrolment: 2,600
- International students: 380 (13%)
- Graduates (Master's and Bachelor's degrees): 570
- Number of English Master's programmes: 13
- Number of English Bachelor's programmes: 1

UMB SCHOLARSHIPS TOWARDS POST-TSUNAMI CAPACITY-BUILDING

JOANNA BODDENS-HOSANG

On 24 December 2004 one of the worst natural disasters on record, the Indian Ocean tsunami, struck 13 countries and killed about 230, 000 people, displacing an additional 2.1 million citizens. Indonesia and Sri Lanka were hardest hit.

UMB has staff and students from the region and during a seminar in commemoration of the disaster, Rector Knut Hove announced that UMB would offer 5 Master programme scholarships for students from countries in the affected area. "Offering knowledge about nature and biology is a solid and long-term contribution to addressing the challenges the area is facing", said Rector Hove at the seminar.

Four students from Sri Lanka and one from Indonesia arrived in Aas in 2005, of which three returned to their home countries with a Master degree in 2007. The remaining two, Sathiyasegar Kandasamy and Umashankar Kanagasingam, both from Sri Lanka, will finish by early 2008. Sathiyasegar has followed the Master in Development Studies at Noragric, and Umashankar the Master in Development and Resource Economics at the Department of Economics and Resource Management.

Both speak of a "golden opportunity" to get a Master's degree. The Northern and Eastern provinces in Sri Lanka where they are from suffer from brain drain due to insufficient resources for higher education and jobs. Scholarships are usually awarded to other ethnic groups but rarely to Tamils.

Umashankar does not know of other countries or universities having offered scholarships. "Most countries contributed with direct aid such as water and medicine, but these scholarships help towards long-term capacity building". The University of Jaffna, where he will be secured a permanent job once he returns



Umashankar Kanagasingam (left) and Sathiyasegar Kandasamy PHOTO: HÅKON SPARRE

with a Master's degree, assisted in directing Norwegian relief aid to where it was most needed. However, about 60% of the Tamil population is still living under temporary housing conditions, he added, since the government has focused most on the southern parts of the country. Sathiyasegar adds "Rebuilding the areas stricken by the tsunami would have been a great opportunity to find peace between the government and the Tamils, but unfortunately this has not happened. The political situation definitely influences reconstruction aid".

Both are very thankful for the opportunity to study at UMB and the many new experiences, contacts and knowledge it brought. Upon return, they hope their skills will contribute to knowledge building at their universities and to the development of the region following the tsunami and civil war. Whilst at UMB, experiences were exchanged and friendships were made with their fellow "tsunami scholars" and other students. Both hope to pursue a PhD degree in the future and put their knowledge to use in their home country.

WORKING FOR A CLEANER WORLD

GRO ELDEN (ENGLISH TEXT: AGRO LINGUA)

Internationally, Norway has a reputation as an environmentally aware nation. An air traffic controller and eco-activist from Japan and an idealist from Canada have come to UMB to study how they can improve the world.

The Norwegian University of Life Sciences (UMB) welcomes students from all over the world. Daisuke Ito from Japan and Bradley Christensen from Canada came to UMB to study agro-ecology, natural resource management and sustainable agriculture. Both of them feel that they will benefit from UMB's unique scientific expertise and meeting students with a broad scope of international experience.

EXCHANGE AGREEMENT WITH TOP-RANKED UNIVERSITY

Bradley is an exchange student from the University of British Columbia (UBC), one of Canada's best known universities. One of his co-students at UBC recommended UMB. Bradley is interested in sustainable agriculture, and in the policies that are needed to achieve sustainability. Back in Canada, he is studying global resources. Bradley is an idealist and hopes to help make the world a better place.

"I came to Norway to get some international experience. My friend said that I would have a better time here than in Denmark", Bradley says with a smile, perhaps with his Danish ancestors in mind.

UMB has had an exchange agreement with the prestigious Canadian university for several years, and numerous UMB students have spent some time studying there. Now, increasing numbers of Canadian students are finding their way



Bradley and Daisuke contemplate UMB's biogramme. The biogramme, or logo, symbolizes the university's ongoing development into new phases.

PHOTO: HÅKON SPARRE

to UMB. Thorbjørn Gilberg, who is in charge of international exchange agreements at UMB, is pleased with this development.

Bradley has lots of plans for what he wants to do after finishing his studies. "After graduating, I could imagine working as an environmental consultant for companies, or perhaps getting involved in sustainable products. I really wish to change society's current consumption trend", says Bradley.

ONE-STRAW REVOLUTION

Daisuke studied crop production and soil science in Tennessee, USA. Afterwards, he worked as an air traffic controller in the Japanese air force for 6 years. In the USA he was inspired by the American sense of patriotism, and thus began to study Japanese history and national identity in his free time.

Daisuke is member of a Japanese voluntary organisation that works with

agriculture, food and pollution. He came to UMB to study agro-ecology. Daisuke has been inspired by the internationally known agricultural guru from Japan, Masanobu Fukuoka.

Fukuoka was originally trained as a microbiologist, but early in his career he returned to his family farm where he developed a cultivation system called 'natural farming'. The system copies simple principles found in nature, and includes the minimisation of soil tillage.

Fukuoka is best known for his book 'The One-Straw Revolution' (1975). He is considered to be quite radical but is nevertheless one of the most influential agricultural philosophers of the 20th century.

"I really felt like coming here to learn more about agriculture and about Norwegian and European culture", says Daisuke. He was granted a scholarship by the Research Council of Norway to study at UMB for two years – a privilege not too many students enjoy.

UMB INCLUDED IN HIGH-LEVEL EUROPEAN EDUCATIONAL PROGRAMME

TROND SOLEM (ENGLISH TRANSLATION: JOANNA BODDENS-HOSANG)

The European Master's programme in Animal Breeding and Genetics offered at UMB was included in Erasmus Mundus, a high-level educational programme making Europe more attractive for students from other parts of the world. A European Master's in Agro-ecology and a Master's in Sustainable Aquaculture at UMB may also see the light of day this year.



PHOTO: HÅKON SPARRE

Educational programmes under Erasmus Mundus are acknowledged as European Master's programmes. In 2006, the European Master's programme in Animal Breeding and Genetics, offered by the Department of Animal and Aquacultural Sciences (IHA), was accepted as one of five programmes from Norway. IHA is one of the partners in the programme which is coordinated by Wageningen University, the Netherlands.

IMPORTANT SCIENTIFIC AREA

"The decision to include the programme recognizes the fact that we have been one

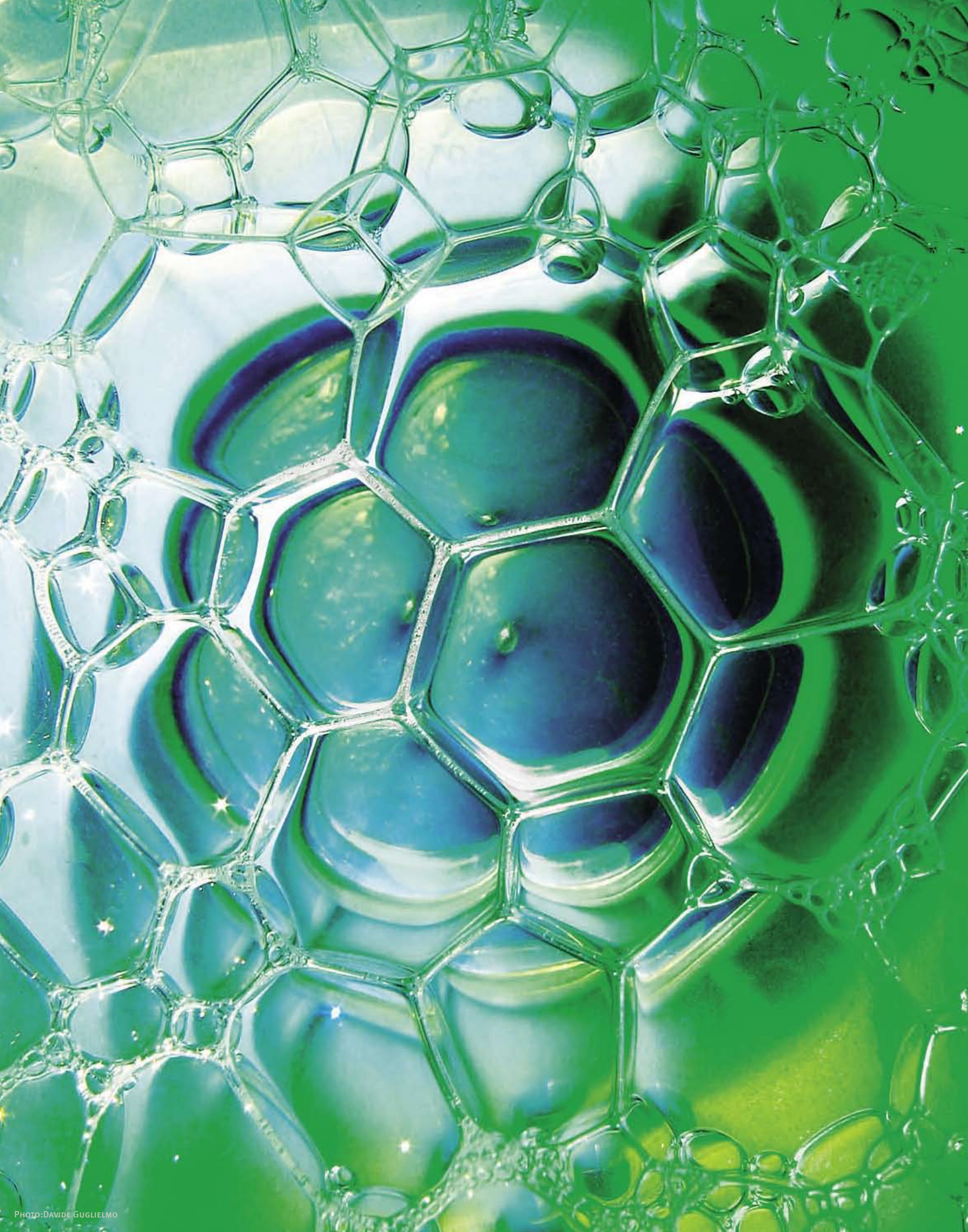
of the best in this area for a long time", says Professor Gunnar Klemetsdal, who is responsible for the programme at IHA.

Students were accepted in February 2007. UMB receives a higher share of international students, and the Mundus students receive compensation for the relatively high Norwegian cost of living. "Aquaculture is becoming increasingly popular internationally, but Norway is very expensive for international students. Scholarships from Erasmus Mundus help the students to meet the Norwegian level of costs", says Klemetsdal.

This year UMB is also applying to

become coordinator for two European Master's programmes: one in Agro-ecology, and the other in Sustainable Aquaculture, after almost succeeding last year. "Erasmus Mundus attracts many students from beyond Europe's borders and makes Europe more visible on the global educational market. At the same time it becomes possible to carry out European scientific-didactic collaboration, which contributes to further scientific development", says Associate Professor Geir Lieblein, responsible for UMB's agro-ecology application.





RESEARCH

UMB is at the forefront of research developments within its core activities, and actively promotes interdisciplinary research in the fields of food science, nature management and human health. The training of researchers (PhD programmes) is given priority. The university's priority areas are food and environmental science, biotechnology, aquaculture, human health and business development. The combined forces of UMB and the other research institutes on "Campus Aas" make up Norway's largest life science research community (excluding medical sciences).

In 2006, research output (measured as number of scientific articles in international journals) continued to increase. About 10% more peer-reviewed articles were published in 2006 than in 2005.

In 2006, UMB initiated the development of a system for securing scientific raw data. This work is being conducted together with other universities, primarily the University of Oslo, and represents a vital part of the overall quality assurance of UMB's research activities.

A lot of work was invested in 2005 and 2006 in preparing the applications

for obtaining Centres of Excellence and Centres for Research-based Innovation. However, the results did not meet our expectations, as the competition was very tough. It is therefore necessary to further strengthen the competitive edge of the research teams.

UMB hosts the Aquaculture Protein Centre (APC), one of Norway's Centres of Excellence. Furthermore, UMB is also host to the Centre for Integrative Genetics (FUGE).

2006 IN FIGURES

- Peer-reviewed scientific publications: 472
- Completed doctorate degrees: 48
- EU projects: 20
- Network projects within the 6th EU Framework Programme: 12
- Centres of Expertise: 1
- FUGE centre: 1
- Popular science articles: 175
- Media coverage: 407 times

CAN BEES TEACH US TO BE YOUNGER?

GRO ELDEN (ENGLISH TRANSLATION: JOANNA BODDENS-HOSANG)

Some bees can alter the speed of their ageing process depending on the tasks they carry out. A group of researchers headed by Associate Professor Gro Amdam at UMB's Department of Animal and Aquacultural Sciences aims to find out why. The study of bee genetics is expected to give valuable results. Maybe the answers can even contribute to curing diseases such as Alzheimer and Parkinson's in the future.



PHOTO: UMB

At UMB a small group of researchers is trying to figure out why some bees actually get younger instead of older. Recently the Norwegian Research Council awarded NOK 10 million to Gro Amdam for her work on the social evolution of bees.

Amdam is a researcher at both UMB and Arizona State University, USA. At both universities she coordinates research groups that study functional genomics in bees. The Research Council funds contribute towards strengthening the research group at UMB, and exchange of experience between the USA and Norway.

SOCIAL BEES The honey bees have long been a part of Gro Amdam's re-

search. The bees' complex social structure, where each bee has a specialized task, makes them interesting research objects.

"We are interested to find out what happened genetically to create such a social being. Genetics do not determine all social behaviour, but we think that many aspects of social evolution can be explained by changes in and between genetic products", Amdam explains.

The researchers do not expect to find a new "super gene" explaining how a species develops. On the contrary, it is the old and well known genes changing their behaviour/tasks that are responsible for social evolution. A breakthrough in this field by Amdam and her colleagues re-

sulted in reaching the cover of the popular science magazine *Nature* in 2006.

MATERNAL BEHAVIOUR Amongst insects, with the exception of termites, only the females are social. Bees make a good example. The drones (male bees) are chased from the hive in the autumn. The bee society has no further use of their services after they have fertilised the young queens. Female bees are socially the most interesting because of the way they organize the work tasks. Amdam's approach is based on the hypothesis that this organization is dictated by genes that have regulated maternal behaviour.

Amdam and her group also believe this organization is connected to ageing, and have previously suggested that the ageing process can be altered during social evolution. Most animals only live as long as they are able to reproduce, whereas socially advanced species like humans, who even take care of other's offspring, live long after reproductive age. Amdam thinks that the honey bees can be used to better understand these changes.

Amdam believes her research can contribute to the development of future new drugs. "There are many similarities in the way humans and bees age. In both species, the nerve cells function and communicate in the same way", she says. This means that the information about bee genetics could be used to develop new drugs for neurological diseases such as Parkinson's and Alzheimer.

ST. LUCIA – ONE OF THE WORLD’S UNIQUE ESTUARIES

JOANNA BODDENS-HOSANG

St. Lucia is Africa’s largest coastal lagoon and has greater biodiversity than any other tropical or subtropical estuary in Africa. For this reason, St. Lucia was declared a World Heritage Site under UNESCO in 1999. In this unique ecosystem, freshwater plants and fauna thrive in an area with extreme high salinity and recurring droughts.

A NUFU-funded project coordinated by Prof. Sylvi Haldorsen of the Department of Plant and Environmental Sciences (IPM) together with the University of Kwazulu-Natal, South Africa, and in collaboration with Eduardo Mondlane University, Mozambique, studies the estuary in order to understand how freshwater-sensitive animals and plants survive in periods when salinity is so high, and how to best conserve it. “The relationship between geology and animal life in St. Lucia is exceptional”, says Haldorsen.

UNIQUE ECOSYSTEM St. Lucia is situated on the coastal Mozambican plain in northeast South Africa. Salt water runs into the lagoon through a tidal channel that connects St. Lucia with the Indian Ocean. The inner part of the lagoon has fresh water as long as there is enough precipitation in the inland catchment. Small organisms are found in the fresh water, which also serves as drinking water for hippopotamuses, crocodiles, birds and large terrestrial herbivores. Droughts have lasted between 2-5 years for the last 50 years, and the salinity in the inner parts can become three times higher than that of seawater.

JOINT RESEARCH Since the start of the project in 1999, five Master students and two PhD students from South Africa have obtained their degrees based on studies in the St. Lucia area. Another PhD student will have finished by the end of the project (2009). Haldorsen has also used the project for UMB Master’s students to get field experience in St. Lucia. Seven



Hippopotamus walking into groundwater-fed pond at the edge of the now dry Lake St. Lucia. PHOTO: R. TAYLOR

have obtained their degrees, and one UMB-financed PhD student completes his thesis at the end of 2007.

Collaboration between the University of Kwazulu-Natal and UMB includes student and staff exchange, with plans for joint student degree work and joint field teaching. Formal guest lecture agreements between Mozambique, South Africa and UMB in ecology and hydrogeology are to be developed. An online graduate course in hydrogeology at UMB includes learning components based on examples from the NUFU project. This course is now linked to UNESCO’s Water Portal, making it useful for a number of universities in the South.

The studies in St. Lucia have been mirrored in Maputaland and Inhaca in Mozambique, where the link between groundwater and ecology has also formed the basis of Master studies.

GROUNDWATER MANAGEMENT

Research work in St. Lucia has focused on the groundwater supply of the estuary during droughts. Based on a groundwater monitoring system a groundwater simulation model is used. The results indicate that the groundwater flow into the estuary can persist for at least a full decade. Fresh water enters the lagoon from four large rivers in the surrounding area but this contributes to a mere 5% of fresh water supply. The rest is supplied by rain water. Research results contribute to proper local groundwater management, something that was not done before. As a result of these studies one management action has been to remove the alien pine forest around St. Lucia and transform these areas into grasslands, which are regularly burnt. This action has resulted in an increase of the groundwater recharge, which is equivalent to 10-20% increase in precipitation.

BIOENERGY – A WINNER IN A GREENER EUROPEAN UNION

TROND SOLEM (ENGLISH TRANSLATION: JOANNA BODDENS-HOSANG)

Bioenergy was the clear winner among alternative forms of energy in the EU's Seventh Framework programme. "Norwegian politicians can learn a lesson from Sweden. We can fulfil one-third of our commitments under the Kyoto protocol through bioenergy", claims energy expert Petter H. Heyerdahl, Associate Professor at the Department of Mathematical Sciences and Technology (IMT).



The government should make bioenergy more profitable, says energy expert Petter H. Heyerdahl. PHOTO: HÅKON SPARRE

This time the EU's new framework programme lasts seven years, not four as it did earlier. This makes the focus on bioenergy even more meaningful. Bioenergy is an EU favourite and there is a high demand for it, including in Norway.

Factors such as the price of oil, climate change and guarantee of supply have turned the EU's attention to green alternatives in its new framework programme. It is also an advantage that bioenergy is easy to produce, says UMB's Associate Professor Petter H. Heyerdahl.

BRAVE SWEDES "Everyone is familiar with bioenergy; the technology is known and we can start at once. What is lacking in Norway is the government's willingness to make those forms of energy that are wanted

more profitable, while making those we don't want less profitable. It's that simple", says Heyerdahl. He would like to draw a lesson from the Swedes who have created favourable conditions for using bioenergy. Today the Swedes use more bioenergy than all the hydropower produced in Norway.

A LITTLE GOES A LONG WAY It is actually possible to accomplish a lot with very little. Heyerdahl welcomes the government's support for pellet stoves and underlines this with a striking example. By exchanging 10,000 kWh of imported coal energy from Denmark with bioenergy, we save an amount of greenhouse gas emission equal to driving a car for four years!

"This can be achieved by using pellet stoves or simple wood-burning stoves.

The issue is to use an alternative form of energy than electricity". Heyerdahl believes that bioenergy can lower greenhouse gas emissions by seven million tonnes per year, a reduction equalling one-third of Norway's commitments under the Kyoto agreement.

The pressure on Norway is increased by the EU which wants the use of biofuel up to 20% within 2020. This percentage equals that of the USA and Canada. Norway lags far behind, also among the other Nordic countries.

"There are many young people interested in learning about bioenergy but we lack the funds to educate them. If we don't increase the academic turnover in this field now, we will have future decision-makers and leaders who are unfamiliar with bioenergy", warns Heyerdahl.

FUTURE ENERGY MIX "Bioenergy on its own can not meet our energy needs. Future solutions lie in renewable energy using local sources as much as possible. In Norway we have hydropower, wind power, wave power, salt power, solar power, solar energy, geothermal heating and tidal streams. "All these sources of energy together can give us many times more electricity than what hydropower alone produces today. Norway is a highly energy rich country. Today oil, coal and gas amount to 85% of the world's energy consumption, but 100 years from now renewable energy will play the largest role", Heyerdahl adds. "As important as it is to find new sources of energy, using those we have today should be done more efficiently".





INTERNATIONAL COOPERATION

UMB is a small university with an extensive and active international network. This is very obvious on the UMB campus, where 77 nations are represented. Students and staff alike develop personal contacts, and 30% of UMB's students spent some time abroad on a student exchange scheme as part of their degree in 2006.

UMB has many institutional agreements with universities outside Norway, some of which have been active since the late 1960s. Currently, some 50 exchange agreements are in effect with universities worldwide, including six Nordic, 44 European and eight North American institutions. In 2006, new agreements were signed with, among others, the University of California, Berkeley; the University of Minnesota (see elsewhere in this brochure) and COMSATS Institute of Information Technology, Abbottabad, Pakistan.

UMB also cooperates extensively with universities in developing countries within the broad range of fields taught at the university. This cooperation is mutually beneficial: it contributes to developing UMB's own expertise, but also transfers

know-how to countries in the South. A large number of students from developing countries have pursued their degree at UMB, and have therewith provided their countries with scientific expertise, while at the same time enabling UMB researchers to develop extensive networks in the respective countries.

The Summer University is a new programme introduced in 2007. The Summer University was developed to enable foreign students to attend short-term study programmes in English. Five students from Canada and the USA attended the pilot programme in the summer of 2007. The Summer University will be offered again in 2008, this time with 3 courses, including two new ones focusing on sustainable sanitation and animal biotechnology.

2006 IN FIGURES

- Academic exchange agreements: 50
- International students representing 77 nationalities
- Courses held in English: 37% of all courses provided
- Taught in English: 1 Bachelor's- and 13 Master's degree programmes
- Articles in international journals and series: 486
- UMB students who made use of the university's formal exchange agreements: 80
- International exchange students at UMB: 132

NORTH-SOUTH COLLABORATION

UMB has several formal frameworks for North-South cooperation. These include the Norwegian Programme for Development, Research and Education (NUFU), Norad's Programme for Master Studies (NOMA), and the Quota scheme for Master and PhD students.



PHOTO: HÅKON SPARRE

NUFU NUFU focuses on academic research and educational co-operation based on equal partnerships between universities in the South (Sub-Saharan Africa, Asia, Central America and the Middle East) and in Norway. In 2006, UMB had 9 projects under the 2002-2006 NUFU programme period. The portfolio amounted to almost NOK 32 million. UMB was successful with 13 project proposals for the new NUFU period (2007-2011) and a 2-year extension for two ongoing projects.

UMB's main partner universities under NUFU are:

- Makerere University, Uganda
- Mekelle University, Ethiopia
- Hawassa University, Ethiopia
- University of Kwazulu-Natal, South Africa
- Eduardo Mondlane University, Mozambique
- Hanoi Agricultural University, Vietnam
- Tribhuvan University, Nepal
- Bunda College of Agriculture, University of Malawi
- Sokoine University of Agriculture, Tanzania

- University of Dar es Salaam, Tanzania
- Birzeit University, Palestinian Territories

NOMA UMB was successful in applying to Norad's new Programme for Master Studies (NOMA) for 2006-2010. Norwegian universities were invited to apply for grants to establish English-taught Master programmes to be conducted in the South.

The two NOMA projects are:

- North-South-South Collaborative Master in Development and Natural Resource Economics
- Master's programme in Conflict, Peace building and Development

The first project is a joint effort coordinated by UMB's Department of Economics and Resource Management and involves Makerere University (Uganda), Hawassa University and Mekelle University (Ethiopia), and Bunda College of Agriculture (University of Malawi). It will run for the period 2007-2010.

The Master's programme in Conflict, Peace Building and Development will be

offered jointly by Tribhuvan University (Nepal), Ruhuna University (Sri Lanka), Eastern University (Sri Lanka) and UMB's Department of International Environment and Development Studies, Noragric.

QUOTA SCHEME Candidates from developing countries or Central and Eastern Europe who intend to follow Master's programmes in English or PhD studies, can apply for financial support under the Quota Scheme (funded by Norad). Approximately 70% of the Quota scholarship is provided as a loan and 30% as a scholarship, a total amount of NOK 80.000 pr. year (2005/2006). When the student has returned to the home country after completing the degree, the support is transferred to a scholarship.

Master's programmes at UMB with Quota scholarships:

1. Agro-ecology (1-2 Quota scholarships)
2. Aquaculture (1-2 Quota scholarships)
3. Development and Natural Resource Economics (2 Quota scholarships)
4. Development Studies (1-2 Quota scholarships)
5. Ecology (2 Quota scholarships)
6. Feed Manufacturing Technology (1-2 Quota scholarships)
7. International Environmental Studies (1-2 Quota scholarships)
8. Radioecology (1-2 Quota scholarships)
9. Plant Sciences: specialization Plant Biology (1 Quota scholarship)

In 2006, UMB had a total of 68 students from developing countries and 10 from Eastern Europe under the Quota scheme.

EXTENSIVE COLLABORATION BETWEEN AAS AND MINNESOTA

ARNSTEIN BRUASET (ENGLISH TRANSLATION: JOANNA BODDENS-HOSANG)

”This is a big day for the Norwegian University of Life Sciences (UMB) and for the exchange of knowledge across the Atlantic”, said Rector Knut Hove as he and University of Minnesota’s President Robert H. Bruininks signed a new and extensive agreement.

Over the past years, UMB has developed close collaboration on knowledge exchange with the University of Minnesota. Robert H. Bruininks headed a large delegation from Minnesota and the collaboration agreement that was signed is an extension of a bilateral research- and collaboration programme that was signed between the USA and Norway in 2005.

EXTENSIVE COLLABORATION PROGRAMME ”Collaboration with the University of Minnesota is the most extensive agreement we have with any foreign university”, says Director of Research Odd Jarle Skjelhaugen.

Projects included in the programme are related to basic research at both universities. This gives a long-term approach to the collaboration which in the first instance focuses mainly on bioenergy, food and health. Six concrete collaboration projects have been established encompassing various activities including exchange of researchers and students.

Secretary General Per Harald Grue at the Norwegian Ministry of Agriculture and Food has played an important role in the collaboration, offering both technical and financial support.

JOINT FOUNDATION OF NOK 10 MILLION The collaboration agreement signed in Aas comes with the understanding that a joint foundation will be established totalling NOK 10 million. The foundation’s return on investment will be



UMB’s Rector Knut Hove (left) and University of Minnesota’s President Robert H. Bruininks signed the agreement on research collaboration between both universities.

PHOTO: HÅKON SPARRE

used to cover a position of a chairperson whose task will be to promote researcher and student mobility and research col-

laboration between both universities. Exchange of Bachelor- and Master level students may already start in 2007.

BUILDING STOVES IN THE HIMALAYAS

GRO ELDEN (ENGLISH TRANSLATION: JOANNA BODDENS-HOSANG)

Deforestation is a serious problem in Pakistan's Northern areas. Since 1997, UMB has addressed this issue through research and collaboration with local organisations. Fuel-effective stoves are now being designed meeting local needs.



PHOTO: NORAGRIC

Associate Professor Ingrid Nyborg, Noragric, is the driving force in a research project whose goal is to help the poor in the Northern areas of Pakistan. Research is carried out with the Pakistani development organisation Aga Khan Rural Support Program (AKRSP). One member of the team is a Danish mason who designs fuel-effective stoves constructed with local material and meeting local budgets.

During a visit to Norway, AKRSP representatives were impressed by the burning- and heat retaining technology of Norwegian stoves. Importing stoves from Norway was out of the question, however.

Kim Pedersen, mason, idealist and adventurer, became interested in the project. He was keen to convey Norwegian stove building technology to the local craftsmen in Pakistan.

Pedersen travelled to Pakistan for the first time in 2004 and what he saw made an impact. "The Kashmir area seems to be from a different era altogether. I was shocked to see what they used for heating purposes, and how basic their lifestyle was."

RESEARCH ON VULNERABLE FOR-ESTS The stove project is part of a large collaboration effort between UMB and

AKRSP which has lasted for almost 10 years. One component of the project deals with deforestation, forest management, and use of firewood in the Northern areas. "We have addressed the environmental and social consequences of firewood use. Firewood is expensive for local communities. While doing research on forest management, one must also take into account the dependence of particularly the poorer households on firewood for their heating and cooking needs in this cold, mountainous environment", says Nyborg.

NEW DESIGN FOR LOCAL NEEDS

On a subsequent trip to the Himalayas, Kim Pedersen built four stove models in different price categories together with local engineers and masons. "Together we constructed four models that local communities in the Northern areas can make themselves. They don't have machines to produce the ovens, so we had to find a simple way of constructing them. We managed, and they were very interested". The stoves have sparked tremendous local interest and demand, and are already being produced by local enterprises for sale on the local market. It is hoped that as the technology is further proven in Baltistan, it will spread to other areas of the Himalayas as well. The key to the success of the process, however, will not be the production of one particular stove, but the degree to which local stove producers are able to continue to design stoves themselves, using improved technologies which are appropriate for their particular conditions.



ORGANISATION

The Norwegian University of Life Sciences is located at Aas, approximately 35 km south of Oslo.

The campus park is one of the largest neoclassic parks in Norway and covers some 150 acres.

Easy and fast public transportation from Oslo or Oslo (Gardermoen) International airport is available by train or bus.

The university has 900 staff, of which half are scientific staff. UMB has 8 departments and a central administration.



PHOTO: KNUT WERNER ALSÉN

UNIVERSITY MANAGEMENT

Rector: Prof. Knut Hove

Pro-rector Education: Dr Trine Hvoslef-Eide

Director of Administration: Nils Dugstad

Director of Academic Affairs: Siri Margrethe Løksa

Director of Research: Odd-Jarle Skjelhaugen

Director of Strategic Planning: Paul Stray

Director of Personnel: Elizabeth de Jong



DEPARTMENTS AT UMB

THE DEPARTMENT OF PLANT AND ENVIRONMENTAL SCIENCES (IPM) provides education and conducts research to provide a sound basis for the long-term management of natural resources, ensure sustainable food production and maintain a good quality of life by integrating food, health and environmental issues. Core areas include basic plant biology, genetics, growth physiology, climate controlled plant production, feed production and crops for human consumption. Other important areas addressed by IPM are the utilisation of plants and plant products, nature and natural resource management, effects of global climate change on terrestrial and aqueous ecosystems, pollution and environmental toxins, agro-ecology and organic agriculture.

Head of Department: Tove Fjeld

The main task of the **DEPARTMENT OF ECOLOGY AND NATURAL RESOURCE MANAGEMENT (INA)** is to develop knowledge about nature and human use of nature. The department conducts both basic research and contract-related research, and contributes to increasing the international knowledge base. The department also participates in knowledge dissemination to stakeholders in natural resource management and to the forest industry. Core areas include basic biology and ecology, nature management and forest science. INA develops knowledge and know-how about the natural resource base for renewable resources such as wood, fish and game, and how their production is affected by different management measures.

Head of Department: Hans Fredrik Hoen

THE DEPARTMENT OF MATHEMATICAL SCIENCES AND TECHNOLOGY (IMT) has a unique position in Norway due to the close links between biological, environmental and technological research. Main research areas include new uses for known technology and developing novel, sustainable technologies. The department focuses on those business sectors with a considerable potential for development, such as the fish farming industry and enterprises dealing with bioenergy and environmental

technology. The general aim of the department's long-term, basic research is to increase our understanding of the mechanisms of biological systems and their interactions with their surroundings.

Head of Department: Vidar Thue-Hanssen

THE DEPARTMENT OF LANDSCAPE ARCHITECTURE AND SPATIAL PLANNING (ILP) provides education and conducts research in the fields of landscape architecture, spatial planning, real-estate development, land law and land consolidation. The department's scientific expertise is linked to public planning within such areas as gardens and parks, housing areas and urban space, recreational areas, cultural landscapes, large-scale landscape encroachment, spatial planning, land use, ownership rights and processes and measures affecting ownership.

Head of Department: Terje Holsen

The core areas of the **DEPARTMENT OF CHEMISTRY, BIOTECHNOLOGY AND FOOD SCIENCE (IKBM)** are chemistry, biochemistry, microbiology, molecular biology, mathematics, statistics and technology. The department aims to contribute to the international development of biotechnology and food science. Research focuses on three main areas: chemical composition and bioactive components; microbiology, molecular biology, proteomics and bioinformatics; and biological process technology. Another important aspect of the department's work is the current focus on food and human health, including such issues as food quality and functional foods.

Head of Department: Are Aasteivt

THE DEPARTMENT OF ANIMAL AND AQUACULTURAL SCIENCES (IHA) develops new knowledge about the utilisation of natural resources in a broad sense in connection with added value creation in agriculture and food production, business development and animal and human health issues. A special focus at IHA is developing agriculture to meet future challenges. The department is Norway's only centre of higher education and research in the fields of animal

science and companion animals, and is one of the country's educational centres in the field of aquaculture. The department's areas of focus include: animal breeding, genetics and genome analysis, ruminant physiology and nutrition, monogastric nutrition, ethology and animal environment, and product quality.

Head of Department: Jessica Kathle

Activities at the **DEPARTMENT OF INTERNATIONAL ENVIRONMENT AND DEVELOPMENT STUDIES (NORAGRIC)** include education, research, institutional cooperation and assignments within the field of Development Studies in general and particularly related to agriculture and natural resource management. Noragric has an interdisciplinary academic environment that focuses on issues that affect the use and management of land-based resources such as land, water, forests and soil, as well as on the utilisation of these resources to improve people's livelihoods. Areas of focus are the fight against poverty, rights to natural resources, politics, economics, conflict and peace-building, food safety, local organisations, administrative regimes and a variety of issues related to sustainable agriculture.

Head of Department: Ruth Haug

THE DEPARTMENT OF ECONOMICS AND RESOURCE MANAGEMENT (IØR) is one of Norway's leading education and research institutes in economics. The combination of economics and resource management is primarily about utilising and dividing scarce resources as efficiently as possible, no matter if the resources in question are natural, labour or capital resources. The knowledge and understanding of economical theory is thus an important decision-making tool in private enterprises, organisations and public administration. IØR provides education and conducts research in the fields of economics and business economics, organisation and management, social science and philosophy.

Head of Department: Anne Moxnes Jervell

FINANCIAL RESULT 2006 (ALL FIGURES IN THOUSANDS NOK)

FINANCIAL RESULT	
ALLOCATIONS FROM UFD* AND OTHER MINISTRIES	480.617
ALLOCATIONS FROM THE RESEARCH COUNCIL OF NORWAY	92.042
COMMISSIONED RESEARCH	96.916
SALE OF PROPERTY, EQUIPMENT, ETC.	7.080
OTHER INCOME	45.268
TOTAL INCOME	721.922
PAYROLL EXPENSES	465.670
INVESTMENTS	23.190
OTHER OPERATING COSTS	302.084
TOTAL OPERATING COSTS	790.943
BALANCE	
ASSETS	298.485
DEPOSITED (OPERATIONAL CAPITAL)	6.340
RETAINED (OPERATIONAL CAPITAL)	11.191
PROVISIONS	94.793
DEBT	186.161
TOTAL OPERATIONAL CAPITAL AND DEBT	298.485

*UFD = MINISTRY OF EDUCATION AND RESEARCH



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