

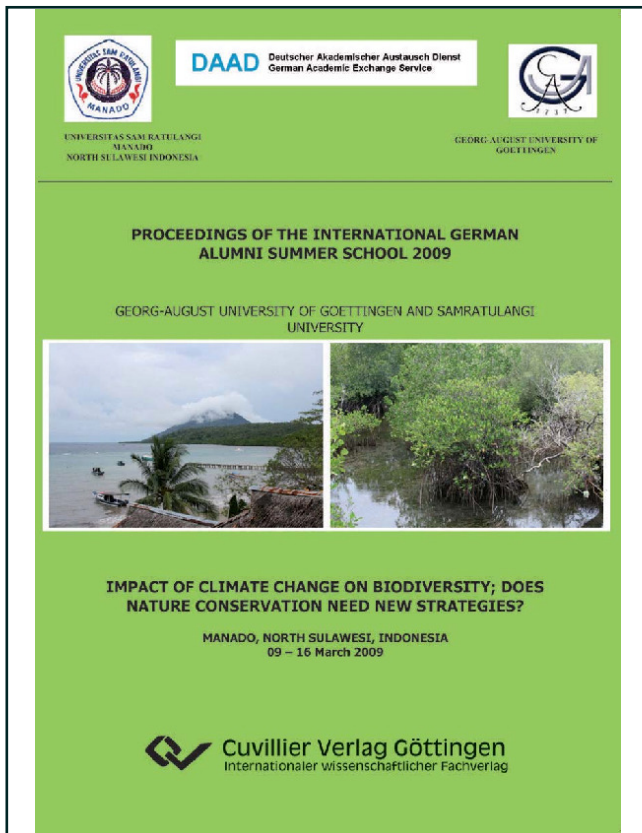


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**Impact of Climate Change on Biodiversity**  
*Does Nature Conservation need new Strategies?*



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## INTRODUCTION:

The German Alumni Summer School 2009 on ‘Impacts of Climate Change on Biodiversity : Does Nature Conservation need New Strategies?’ was jointly organized by the Centre for Nature Conservation (CNC), Georg-August University, Göttingen (Germany), South-East Asian German Alumni Network (SEAG) and Biodiversity Conservation and Sustainable Use Network, Indonesia (BIODICS-Alnet). This summer school was funded by the German Academic Exchange Service (DAAD) and targeted the German Alumni from Southeast Asia as well as scientists and experts from various disciplines.

The German Alumni Summer School encompassed significant contributions from participants from Germany, Australia, Indonesia, Malaysia, India and Philippines with the main concern on *climate change and biodiversity*. In addition, several key lectures and expertise were incorporated into the summer school program.

Climate change and its impact on biodiversity has become the main issue in recent times. Climate is changing rapidly due to human activities especially burning of fossil fuels and enormous CO<sub>2</sub> output. Several studies indicated the correlation between deforestation, species loss and climate change. One of the serious efforts to minimize or mitigate the emission of CO<sub>2</sub> is to generate and use bioenergy. As the demand for this alternative energy is rapidly increasing, large areas of rainforest are being opened and altered to palm oil plantations and other types of plantation to supply the raw materials for biofuel. This can adversely accelerate climate change and biodiversity loss. Moreover a paradox concerning bioenergy and carbon stocks is emerging specifically in tropical countries, and this should be pointed out.

With the objective of discussing the impact of climate change on biodiversity and seeking solutions for sustainable development, the following main areas were covered :

- Global climate change as the challenge for the future.
- How climate change is affecting biodiversity.
- Social equilibrium in consumption of bioenergy.
- Food crisis and renewable energy resources

- Climate change, renewable energy and biodiversity: Implication for nature conservation.
- Climate change and tropical rainforest.
- Climate change and forest fire
- The impacts of climate change on marine biodiversity
- Effects of climate change on agriculture and food supply.
- Biodiversity management as important means to reduce climate change.

In addition to the lectures and presentations, there were discussions during the group activities and field trips. Alumni networking activities and future programs of SEAG-BIODICS-Alnet were also discussed after the plenary sessions.

As part of the field excursion program, a field trip to the Bunaken National Park was conducted. During this trip, there were presentations and discussions addressing the following issues:

- Climate change, coral bleaching and coral mortality.
- The assessment of coral reefs alteration.
- Climate change and coastal human communities.
- Assessing and predicting the influence of climate change on seashore species.
- Climate change: threats to mangrove forest and its biodiversity.
- Managing mangrove for resilience to climate change.

**TARGET GROUPS:**

The focus is given on German Alumni from South-East Asia. Experts and advanced students working on the science and management related to climate change and biodiversity conservation are invited to participate. Institutional affiliations include research and education, NGOs, government agencies, and civil society organizations. The selected participants are given an opportunity to present climate change and biodiversity related issues based on their capacities.

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**FOREWORD:**

Excellencies,  
Distinguished guests,  
Ladies and Gentlemen,

Welcome to Manado. I am very pleased to be here this morning to attend the opening ceremony of the German Alumni Summer School in Manado – Indonesia. I want to thank the organizing committee, particularly to Dr. Jolanta Slowik, for choosing Sam Ratulangi University to host this summer school. I believe this summer school will strengthen the relationship not only among the German Alumni but also between Göttingen University as the organizer and Sam Ratulangi University as the host.

Let me give a brief introduction about Sam Ratulangi University. This university consists of ten faculties including Medicine, Engineering, Agriculture, Animal Science, Fisheries and Marine Science, Economics, Law, Social and Political Sciences, Letters, and Mathematics and Natural Sciences. Soon we will also start a new faculty, namely the Faculty of Public Health. We run various academic programs from undergraduate to Doctoral level. We also have several research centers. One of them is the research center for environment.

In order to increase the quality, we setup several programs which is one of them is to increase cooperation and collaborations with international universities and other related institutions. Currently, we only have a very few collaborations with German Institutions.

Therefore, I am looking forward to having more intense cooperation and collaborations with German Institutions, particularly DAAD and Göttingen University. I believe such cooperation will not only benefit the parties involved but also can strengthen the relationship between the two countries.

We all are experiencing the climate change including the global warming phenomenon. I agree that this is one of the greatest environmental challenges ever facing by this planet. Therefore, I fully support the chosen topic for this summer school which is ***“Impact of Climate Change on Biodiversity: does nature conservation need new strategies?”***

Finally, while you are here please enjoy your stay by visiting some interesting sites including the excursion program setup by the local committee. You may also be interested to bring home some of our traditional souvenirs and try some of our traditional food.

I wish you all a successful summer school and an enjoyable stay.

*Professor Donald A. Rumokoy*

*Rector of Sam Satulangi University,*

*Manado, North Sulawesi, Indonesia*

## **FOREWORD:**

Each day we are confronted with news on various global crises like financial crisis, energy supply crisis, biodiversity crisis, food supply crisis, demographic crises, climate crisis and many more. By definition crisis is a critical, turning point or state of affair. Every crisis is unique, and can be managed and mitigated through the systematic development and application of a comprehensive plan.

‘The Impact of Climate Change on Biodiversity’- It is well known for science that mankind is totally dependant on biodiversity from the gene level through the species, populations, ecosystems, landscape level and on its functiones and services.

Why didn't we till yet learn how to use in a sustainable way this basis of our existence? There are many answers depending on the various disciplines we are representing or our personal opinion. It is sure that the species *Homo sapiens recens* is responsible for two of the present day crisis- biodiversity loss and climate change. Human activities during historical times were mostly unsustainable but we had the possibility to leave destroyed lands and look for new existence elsewhere but now our Earth has become too small for our big population and there are many borders and hurdles to overcome.

Climate change influences biodiversity and the species can either adapt, escape or become extinct. Many species are unable to adapt within a short time period to climate change or to escape and migrate to other places because of the barriers we have created in the landscape or habitats and therefore have no chance to survive.

What can we do as scientists to stop or mitigate biodiversity loss and climate change ? We are not politicians, decision makers or even bankers with huge amount of money lost on speculations.

Our power is knowledge and to have more influence on the society we should concentrate this knowledge from different disciplines - it means to work together and not against each other. Field Biology, Ecology, Technical Sciences, Genetics, Social Science, Philosophy, Ethnology and other sciences should coordinate in working out the ways to overcome many crises that we are facing.

The interdisciplinary research and proper, modern education can pave the way for a better understanding and to overcome the barriers we have built between the different disciplines.



Our Summer School was an excellent example of interdisciplinarity and internationality. In spite of all the crises we are confronted with, I hope that science will play an important role in searching for the practical solutions and not create the new ones like genetically modified crops. After Prof. K G Saxena from the School of Environmental Sciences, Jawaharlal Nehru University, New Delhi, India, I would like to point out three steps to mitigate the climate change and biodiversity crisis :

1. Changing in Policy and economy roles
2. Changing in our behavior
3. Increasing of our knowledge

Polish philosopher Kolakowski had written that ‘unlimited glutony is the main problem of humanity’.

We are responsible in each country for the biodiversity and we have to care about it. Until now, escape to other planets to destroy them and the adaptation to climate change that we have talking about has many limitations. As scientists we should be modest and teach the students the conscience and sensibility towards the variety of life on our Earth.

Our Summer School has specifically dealt with biodiversity crisis and climate change.

The UNO 7 Millennium goals for development are looking forward to

- Integrate the principles of sustainable development into country policies and programmes to reverse loss of environmental resources
- Reduction of rate of biodiversity loss by 2010,

The future of next generations is depending on the fulfilment of these presumptions. In spite of these expectations the loss of biodiversity is still going on and the main causes are globalisation, human population growth, increasing demand for resources and overexploitation of natural resources, fragmentation of natural habitats, introduction of alien species and human induced climate change.

The habitat change and alteration together with climate change are declared by most of the scientists as the main reasons for biodiversity alteration. Climate is changing rapidly due to human activities especially due to burning of fossil fuels with increasing CO<sub>2</sub> output. Several studies have documented the correlation between deforestation, species loss and climate change. The primary goals of this Summer School were:

- To bring the German alumni and experts together for exchange of scientific ideas and knowledge with an interdisciplinary approach
- Establishment of close cooperation between International Biodiversity Network (INBINET) and Indonesia Network for Biodiversity Conservation and Sustainable Use (BIODICS)
- Preparation of proposal for our next Alumni Summer School in Indonesia in 2010: with venue, theme and topics.

An International Seminar on Genetic and Climate Change had also been incorporated into our program so as to be able to widen our knowledge on the new aspects of Molecular Biology, Genetics and Climatology.

I would finally like to thank all the participants, guests and key note speakers for their excellent contributions, the authorities of Sam Satulangi University, Manado and DAAD Germany for supporting this Summer School and would like to appreciate the organising Committee members Jane Onibala, Margaretha Pangau-Adam and Kamini Barua for giving their extensive support and assistance in the management of the groundwork and preparation of the Summer School.

*Dr. Jolanta Slowik,*

*Centre for Nature Conservation,*

*University of Göttingen, Germany*