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ČESKÁ ZEMĚDĚLSKÁ UNIVERZITA V PRAZE

CZECH UNIVERSITY OF LIFE SCIENCES
Faculty of Agrobiology, Food and Natural Resources
Prof. Svatopluk Matula
Head of the Dept. of Water Resources
Kamýcká 129, 165 21 Prague 6 – Suchdol,
Tel.: +420 224 384 636, Fax: +420 234 381 835
E-mail: matula@af.czu.cz

To whom it may concern

Final Report of the project AKTION 64P12 (2012-2013)

Project coordinator:
Prof. ing. Svatopluk Matula, CSc, Czech University of Life Sciences in Prague, FAFNR, Head of the Dept. of Water Resources
Project partner:
Univ. Prof. Dipl. - Ing. Willibald Loiskandl, BOKU Wien, Head of the Institute IHLW

Additional participants:
Ing. František Doležal, CSc., CULS
Dipl. Ing. Ilse Kogelbauer, BOKU
Ing. Getu Bekere Mekonnen, CULS

Activities of the Project during 2012 and 2013
The support of this project was oriented to financing the exchange between PhD students and staff of both institutions and relevant units for the scientific work, visits and some lectures. Especially positive role of project was to support PhD students from both universities to exchange places for one month research stays in both departments. The project was mainly focused on the support of experimental work, computer simulations, collecting of experimentally measured data in the field and evaluates them. Finally the presentation of the results (conferences, publications) has been also included.

Short description of the project activities within 2012-2013:
A small research team consisting of two PhD students, one of each participating University (G. B. Mekonnen and I. Kogelbauer) and three teachers from the staff (F. Doležal, W. Loiskandl and S. Matula) were successfully running the project. Two MSc students, one from CULS (A. Abdelfattah, specialised on field measurements), and one from BOKU (K. Madry, specialised on HYPROB) who is also a participant of the well running Double Degree MSc Program NRE/NARMEE of the involved universities was acting as experimentalists. The team was using successfully field, laboratory and other facilities of both universities. The selected experimental fields (CULS in Prague- Suchdol and BOKU in Gross Enzersdorf) were well used for running of the project. These stations are well equipped and have available mans soil-physical, hydro-meteorological, and other data including the evaporation measurement, several independent systems for soil water content measurements are installed there, and the measurement of soil water potential could be done as a part of data collecting. Stations are also equipped with lysimeters. To collect and store data of the stations the automatic systems were used. Detailed soil physical, hydro-physical and other properties of the soil profile were available to the PhD students as well as research from the scientific databases of the stations. Some additional survey and measurements were organised and done by both PhD students with some minor help of the teachers from both Universities. The Institute of Hydraulics, and Rural Water Management BOKU and the Dept. of Water Resources FAFNR, CULS are very well equipped for the laboratory determination of soil hydro-physical properties, have large experience in using field lysimeters and electronic sensors and devices in the field. The laboratory background of both institutions was successfully used also for the practical training of PhD students in certain methods

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(for example Mr. Mekonnen was learning how to use HYPROB system in BOKU laboratory with the help of K. Madry).

The main activities of the staff (listed in alphabetic order of names):

Dr. Doležal
- Field station at CULS Prague-Suchdol management
- Visits of BOKU focused on the field work and teaching/scientific co-operation
- Preparing the publications, participating in the discussions and experience exchange in both dept.
- Participating in the field trip – excursion to Neusidlersee Project of BOKU
- Co-operation in the laboratory methods experience exchange

Prof. Loiskandl
- Managing the Austrian side of the project
- Organising of the visits of staff and stays of the PhD student, including MSc student
- Participating in lecturing, visiting the co-operating dept., field facilities
- Preparing publications, participating in the discussions and experience exchange in both dept.
- Preparing and participating in the field trip – excursion to Neusidlersee Project of BOKU
- Performing co-operation in the laboratory and field methods experience exchange
- Transferring teaching methods and experience from BOKU to CULS

Prof. Matula
- Managing the whole Project and also the Czech side of the project
- Organising of the visits of staff and stays of the PhD student, including MSc student
- Participating in lecturing, visiting the co-operating dept., field facilities
- Preparing publications, participating in the discussions and experience exchange in both dept.
- Participating in the field trip – excursion to Neusidlersee Project of BOKU
- Performing co-operation in the laboratory and field methods experience exchange
- Transferring teaching methods and experience from CULS to BOKU

The main activities of the PhD students (listed in alphabetic order of names):

Ing. Kogelbauer - PhD student
- Participating in the one month exchange stay in CULS supported by fellowship of Aktion
- Participating in the visits and stays of the staff and PhD student
- Participating in the simulation work (HYDRUS 1D, HYDRUS 2D) at both co-operating dept., participating in the field works
- Preparing publications, participating in the discussions and experience exchange in both dept.
- Presenting of collective work (related to publication no.: 2 and 3)
- Participating in the field trip – excursion to Neusidlersee Project of BOKU
- Performing co-operation in the laboratory and field methods experience exchange
- Transferring data, elaborating them and using the facilities of both institutions (BOKU, CULS)

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Ing. Mekonnen - PhD student

- Participating in the one month exchange stay in BOKU supported by fellowship of Aktion
- Participating in the visits and stays of the staff and PhD student
- Participating in the laboratory measurement techniques (HYPROB) at both co-operating dept., participating in the field works
- Preparing publications, participating in the discussions and experience exchange in both dept.
- Presenting of collective work (related to publication no.: 4)
- Participating in the field trip – excursion to Neusidlersee Project of BOKU
- Performing co-operation in the laboratory and field methods experience exchange
- Transferring data, elaborating them and using the facilities of both institutions (BOKU, CULS)

Publications related to the project:

1) Kogelbauer, I., Doležal, F., Matula, S., Loiskandl, W., 2012: Observation and modelling of preferential percolation in a Chernozem soil. Poster, presented at 2nd International Conference on Hydropedology, Leipzig, Germany, 22 - 27 July 2012.
2) Kogelbauer, I., Doležal, F., Matula, S., Loiskandl, W., 2013: Observation and modeling of preferential percolation in Mollisol. Manuscript, submitted for publication in Vadose Zone Journal, January 2013. Rejected in April 2013 in submitted form – see next article.
3) Kogelbauer, I., Doležal, F., Matula, S., Loiskandl, W., 2013: Preferential percolation quantified by water content sensors and a dual porosity model. Revised manuscript, submitted for publication in Vadose Zone Journal, July 2013 - in the review.
4) Mekonnen, G.B., Matula, S., Dolezal, F., Fisak, J., 2013: Correction of rainfall measurement bias due to systematic error in tipping bucket raingauge: a simplified measurement method with manual raingauges in the field. Submitted for the Journal of Atmospheric Research, July 2013 – in the review.

NOTE: The publication No. 1 was already included in the Report 2012 of this project, the publications no. 3 and 4. will be mailed to the Aktion Office in Prague after the acceptance of the manuscript for the publishing. In this case the submitting confirmation pages (publication no. 2, 3) and an abstract page (publication no.: 4) are included in printed version of this report. Acknowledgement of all presented publications consists of text about the Aktion 64P12 support.

Prague, July 28, 2013

Professor S. Matula
(on behalf of the project team)