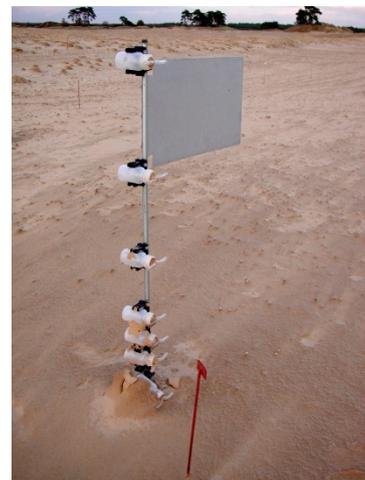
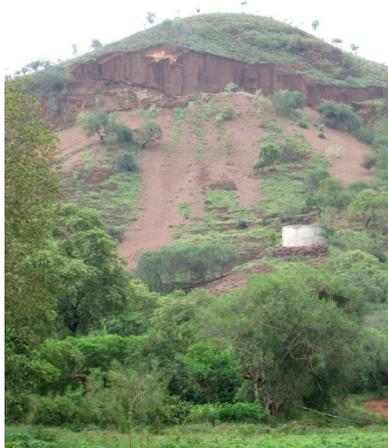


MSc Thesis topics of the SLM group 2018



In this booklet we present a selection of MSc thesis topics offered by the SLM group for 2018. These are topics where for sure students are needed, either as for a major or minor thesis, but other topics might become available any time and you can also suggest your own research topic.

Topics in this booklet are divided in two categories: SPP and LMS topics:

- **SPP topics:** Soil Physics & Processes, research on understanding and modelling processes in land and water conservation, as well as developing new methods, techniques and equipment to measure physical aspects of land and water in lab and field.
- **LMS topics:** Land Management & Society, research on driving forces and impact for farmers and society of land degradation, as well as solutions and (designing) measures to move towards sustainable land management.

Several of the offered thesis topics combine physical/technical aspects of land and water management with more socioeconomic aspects. So check out all topics and feel free to suggest your own research idea!

If you plan to do your thesis with the SLM group please first request an intake with Michel.Riksen@wur.nl who will further guide you.

MSc thesis supervisors at the SLM group

SLM Staff member	Expertise	Approach
 <p>Dr.ir. Michel Riksen Atlas room C405 Phone: 0317 482833 Michel.Riksen@wur.nl</p>	<ul style="list-style-type: none"> - Wind erosion - Coastal dune management - Soil and water conservation - Landscape restoration 	
 <p>Dr.ir. Jantiene Baartman Atlas room C409 Phone: 0317 486131 jantiene.baartman@wur.nl</p>	<ul style="list-style-type: none"> - Soil erosion modelling - Physical land degradation processes - Soil and water conservation 	
 <p>Dr.ir. Aad Kessler Atlas room C413 Phone: 0317 486055 aad.kessler@wur.nl</p>	<ul style="list-style-type: none"> - Soil and water conservation - Integrated Farm Management - Farmers' decision-making and adoption - Intervention strategies 	
 <p>Dr. ir. Luuk Fleskens Atlas room C405 Phone: 0317 485467 Luuk.Fleskens@wur.nl</p>	<ul style="list-style-type: none"> - Ecosystem services - Multi-scale impact assessments SLM - Farmer decision-making - Water harvesting 	
 <p>Prof. Dr. Sjoerd van der Zee Atlas room C407, Phone: 0317 482103 Sjoerd.vanderZee@wur.nl</p>	<ul style="list-style-type: none"> - Water flow solute transport - Pollutant behaviour in soil & groundwater - Contaminant Bioavailability 	
 <p>Dr. Jerry Maroulis Atlas room C.413 Phone: 0317 482881 jerry.maroulis@wur.nl</p>	<ul style="list-style-type: none"> - Erosion processes - Fluvial geomorphology - Soil conservation - Land degradation - Online education 	

MSc thesis supervisors at the SLM group

	<p>Ing. George Bier Atlas room B.417 Phone: 0317 482830 George.bier@wur.nl</p>	<ul style="list-style-type: none"> - Hydrology - Ground water - Modeling 	
	<p>Dr.ir. Jos van Dam Atlas room C.411 Phone: 0317 484825 Jos.vandam@wur.nl</p>	<ul style="list-style-type: none"> - Hydrology - Soil Physics - Modeling ecohydrology 	
	<p>Dr.ir. Violette Geissen Atlas room C.403 Phone: 0317 484825 Violette.geissen@wur.nl</p>	<ul style="list-style-type: none"> - Environmental Management - Land Degradation - Soil Biology - Soil Chemistry - Soil Fertility - Soil Management - Soil Physics - Soil Sciences 	
	<p>Dr.ir. Martine v.d. Ploeg Atlas room C.411 Phone: 0317 483714 Martine.vanderploeg@wur.nl</p>	<ul style="list-style-type: none"> - Hydrology - Soil Physics - Water Management 	
	<p>dr.ir. Klaas Metselaar Atlas room B.417 Phone: 0317 485322 Klaas.Metselaar@wur.nl</p>	<ul style="list-style-type: none"> - Eco-hydrology - Soil Physics - Water Management 	
	<p>Prof.dr. Coen Ritsema Atlas room C.403 Phone: 0317 486517 Coen.ritsema@wur.nl</p>	<ul style="list-style-type: none"> - Land Degradation - Soil Management - Soil Physics 	
	<p>Didi Stoltenborg, MSc Atlas room C407 Phone: 0317 480117 Didi.stoltenborg@wur.nl</p>	<ul style="list-style-type: none"> - Study advisor - Lecturer 	

MSc thesis research Topics

Soil Physics & Processes





Post-fire wind erosion in the coastal zone of north-central Portugal



As widely known, 2017 was a particularly dramatic year in Portugal in terms of fatalities by wildfires. Also the total area burnt was exceptional in 2017, well-exceeding those of the record years of 2003 and 2005. This included a very substantial part of the (sub-)littoral pine plantation areas that are being managed by the Portuguese Institute for Nature Conservation and Forestry (ICNF) and had originally been planted to control wind erosion and moving sand dunes, ranging from 50 to 90 % in the various management units. One of the most heavily affected area is the so-called Mata Nacional de Leiria, which comprises some 11.000 ha that started to be planted with pine back in the 13th century and, as such, has a particular emblematic social-cultural value in Portugal.

The ICNF invited the Portuguese scientific community to assist with the planning and monitoring of the recovery of the burnt (sub-)littoral pine plantations. The ESP team has assumed a coordinating role on assessing the risk of erosion by water and especially wind, proposing measures to mitigate these risks, and monitoring erosion processes and the effectiveness of the implemented soil conservation measures. The envisaged MSc thesis study focuses on measuring wind erosion in the most vulnerable burnt areas (see picture on the right, showing a pine stand that had been logged shortly before the wildfire), by designing and setting-up a field experiment and collecting data and samples through regular field trips. However, it could also include a wind erosion risk modelling component.

Host institute: esp team (espteam.web.ua.pt), CESAM, University of Aveiro,

Country: Portugal

Starting date: any time

SLM contact person: Michel Riksen



Assessment of vertical transport of macro-and microplastics and impact of using organic amendments originating from landfills in agricultural fields



What is the Problem?

In Rwanda, despite the presence of a governmental law prohibiting the use of plastic bags, the population has been using plastic bags for many years. Still now, the population is still using other types of plastic materials in numerous applications such as green-houses, nurseries for plant seedlings, building materials, etc. The waste generated from urban cities is collected and disposed at the designated disposal sites (landfills) with lack of proper landfill management measures. This may generate microplastics over time, leading to high accumulation of microplastics in terrestrial ecosystem. Additionally, people have been using the organic manure from landfill sites as a soil fertility amendment practice. There is little insight in the risks of macro- and microplastic redistribution to and within the terrestrial environment and no is aware of the risks of macro- (pellets > 5 mm) and micro-plastics (pellets < 5 mm) to the terrestrial ecosystems. This study aims at increasing insight into the possible pathways of macro- and microplastics into the terrestrial environment.

Work to be done:

- Experiments will be conducted to investigate the effect of using organic amendment originating from landfills in agricultural fields (flat soils, and sloping soils),
- Soil sampling will be done before experimentation and after experimentation
- Laboratory extractions of micro-macroplastics will be done from soil samples taken at different depths in the soil pits
- Soil chemical and soil physical properties will be analysed from the soil samples in the laboratory before and after harvesting.

Host institute: University of Rwanda-CAVM

Country: Rwanda

Starting date: September, 2018

SLM contact person: Jantiene Baartman (jantiene.baartman@wur.nl, +31 317 486 131) and Michel Riksen (michel.riksen@wur.nl, +31 317 482 833)





The role of farm management practices of using organic amendments originating from landfills on soil physical and chemical properties



What is the Problem?

In Rwanda, despite the presence of a governmental law prohibiting the use of plastic bags, the population has been using plastic bags for many years. Still now, the population is still using other types of plastic materials in numerous applications such as green-houses, nurseries for plant seedlings, building materials, etc. The waste generated from urban cities is collected and disposed at the designated disposal sites (landfills) with lack of proper landfill management measures. This may generate microplastics over time, leading to high accumulation of microplastics in terrestrial ecosystem. Additionally, people have been using the organic manure from landfill sites as a soil fertility amendment practice. There is little insight in the risks of macro- and microplastic redistribution to and within the terrestrial environment and no is aware of the risks of macro- (pellets > 5 mm) and micro-plastics (pellets < 5 mm) to the terrestrial ecosystems. This study aims at increasing insight into the possible pathways of macro- and microplastics into the terrestrial environment.

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Host institute: University of Rwanda-CAVM

Country: Rwanda

Starting date: September, 2018

SLM contact person: Jantiene Baartman (jantiene.baartman@wur.nl, +31 317 486 131) and Michel Riksen (michel.riksen@wur.nl, +31 317 482 833)





Rejuvenating perennial species on Bonaire: locations and strategies



Project Description

Methodology: field work, data analysis, mapping and measuring

Research objective/question:

A reforestation project on Klein Bonaire has been set up by Elsmarie Beukenboom (ex dir STINAPA). In this area STINAPA are now looking for a way in which this and similar projects can be continued. There are quite a few questions. Continue the project? What is the best method? Cluster of several shade trees and then let nature take its course? What kind of shade trees? On mainland Bonaire vegetation restoration needs to be supported by mapping soil, watershed and other site factors, (vegetation species has already been completed, vegetation cover would be helpful). This could give a more detailed picture of the restoration areas. The topic needs to be finalized in discussion between WUR, Stinapa, and ECHO. Also for MFN and Biology master students.

Host institute: WUR in cooperation with STINAPA, and ECHO Bonaire

Country: Bonaire

Starting date: open

SLM contact person: Klaas Metselaar (Klaas.metselaar@wur.nl) with Milena Holmgren (REG)



Helping the development of a hydro-ecological model for semi-arid Brazilian caatinga forest structure and function



This project will focus on the dry Caatinga vegetation of North East Brazil, which has suffered from scientific neglect, destruction, and lack of conservation attention, despite a high level of unique (endemic) plant species that are adapted to the region's severe and erratic droughts. Linking to a recently UK/Brazil funded research project, "Nordeste", this project will help investigate how gradients in rainfall amount and variability combine with contrasting soil physical and chemical properties to influence the key structural and physiological properties of semi-arid vegetation..

The principle tool to be built upon will be a Soil-Vegetation-Atmosphere Transfer (SVAT) model [1-3], serving to describe the fluxes of radiation, heat, water vapour and CO₂ between a multi-component Caatinga system (trees, shrubs, herbs, grass, succulents, bare soil) and the atmosphere. This modelling approach already requires a knowledge of above-ground vegetation characteristics, with this project adding below-ground competition for nutrients and water, and an above- and below-ground growth mode

Using a literature search and a mechanistic modelling approach the project will aim to:

- Probe how caatinga **above ground growth strategies link to below-ground root architecture and water/nutrient uptake**
- This will be achieved through appropriate simulations with the final bespoke numerical model of ecosystem carbon, heat and water exchanges.

Literature

(1) Wallace, J.S., Quarterly J. of the Royal Met. Soc, 1997, 123: 1885-1905; (2) Wallace, J. and A. Verhoef, Leaf Development and Canopy Growth, 2000: 204-250 (3) Verhoef, A. and S. Allen, Ecol. Mod., 2000. 127, 245-267;

Host institute: University of Reading (Anne Verhoef)

Country: UK

Starting date: to be agreed with partner, also internship

SLM contact person: Klaas Metselaar (Klaas.metselaar@wur.nl)



Palm distribution on Curacao: factors defining growth and occurrence



Project Description

Methodology: lab work, data analysis, mapping and measuring

Research objective/question:

Map the population structure of the only native palm species found on Curacao. This palm species is found only in the area of the Christoffel Park, and only in the higher parts of the Christoffel Park (characterized by a single geological formation). These upper parts are characterized by higher humidity. Earlier work was done by Winkelman (1979). The question is why is this palm's distribution limited - grazing by feral goats, donkeys and deer? Or do other factors play a role (exposition, slope, soil pH or other soil characteristics)? This could be combined with germination tests on other species. On Carmabi we have two small greenhouses and a lab where experiments could be done with seeds of the other species (in due time will have to determine which tree species seeds are available). Also for MFN and Biology master students.

Host institute: WUR in cooperation with Carmabi Curacao

Country: Curacao

Starting date: open

SLM contact person: Klaas Metselaar (Klaas.metselaar@wur.nl)



Floodplain hydrology: a model comparison



Project Description

Methodology: Detailed field (soil and water) modelling and model comparison

Research objective/question:

Biodiversity of floodplain meadows is highly desirable, but difficult to achieve and keep, given nutrient and sediment loadings of rivers. Understanding the groundwater dynamics is one important part of the management of these systems. Within ongoing analyses of floodplain meadows in the UK and in the context of monitoring by remote sensing, we are looking for a student who is willing to do a study comparing different hydrological models. The study will be based on available datasets, and will focus on the soil physical parameterization.

Literature:

S. Punalekar A. Verhoef, et al. 2016. Characterization of a highly biodiverse floodplain meadow using hyperspectral remote sensing within a plant functional trait framework. *Remote sens.* 8:112

Host institute: University of Reading (Anne Verhoef)

Country: UK

Starting date: to be agreed with partner, also internship

SLM contact person: Klaas Metselaar (Klaas.metselaar@wur.nl)



Biochar soil management effects on soil moisture and temperature interactions



Project Description

Biochar is considered a pivotal tool to realise the C-sequestration objective of the [4/1000 initiative](#). By improving soil organic carbon management, Portuguese soils can also adapt to Climate Change and improve resilience. Science needs to figure out how to use biochar to improve soil functions, in Mediterranean environments particularly how to improve soil water storage sustainably.

Research questions

Does biochar improve soil water storage, and if so, how?

Does biochar increase soil temperature by lowering the albedo?

Does increased bare soil evaporation counter increased solar radiation absorption, for soil heating?

Methodology

Fieldwork, laboratory work, and desk work.

Host institute: University of Aveiro

Country: Portugal

Starting date: October 2018

SLM contact person: Jantiene Baartman (0317-486131; jantiene.baartman@wur.nl)



Impacts of microplastics in terrestrial systems



Project Description

The accumulation of plastics in the environment constitutes an emerging societal and scientific concern. Microplastics (< 5 mm) can reach high densities, and can interact with organisms and the surrounding environment, being commonly found associated with other contaminants. Although microplastics have been widely investigated in aquatic systems, very little attention has been paid on terrestrial systems.

Research questions

Are urban and agricultural soils impacted by microplastics and if so what's their distribution and amount? Does microplastic impair terrestrial organisms?

Methodology

Fieldwork for sample collection, laboratory work for sample analysis and ecotoxicological assessment

Host institute: University of Aveiro

Country: Portugal

Starting date: October 2018

SLM contact person: Jantiene Baartman (0317-486131; jantiene.baartman@wur.nl)



Modelling post-fire hydrological and erosive response



Project Description

Runoff and erosion often increases after (wild)fire has (partly) removed the vegetation. This project requires the application of several models to estimate post-fire runoff and erosion in a recently burned area. These estimations will make use of field data collected by the student.

Research questions

Which model performs better estimating post-fire hydrological response?
After adapting these models to post-fire conditions, is it possible to use them as a post-fire management tool?

Methodology

Participation in fieldwork campaigns taking place in recently burned areas, for model input collection. Application of several models to post-fire environments (e.g. RUSLE, MMF, PESERA, LISEM, etc), considering calibration and validation with field data.

Host institute: University of Aveiro

Country: Portugal

Starting date: to be determined

SLM contact person: Jantiene Baartman (0317-486131; jantiene.baartman@wur.nl)



Snowmelt, frozen soils and soil erosion in Norway



Project Description

One of the research themes of the Nibio institute in Southern Norway (As) is the understanding of water pathway processes in small catchments and to define small, local measures for reducing peak flow and soil loss.

Depending on the interests of the student, and the time of the year, several **research topics** can be formulated, e.g.:

- Soil erosion after spring snowmelt periods
- Analyzes of soil and vegetation parameters during the growing season
- Effectiveness of local soil conservation measures for erosion control
- Modelling soil erosion, with focus on cold climate processes

Research activities:

Mix of fieldwork, laboratory and data analysis. Fieldwork could consist, depending on the research focus, of sampling and measurement of soil and vegetation characteristics, measurement of runoff and soil loss from small catchments and snow dynamics measurements.

Host institute: NIBIO – Division of Environment and Natural Resources, Norway: Jannes Stolte

Country: Norway

Starting date: anytime / as soon as possible

SLM contact person: Jantiene Baartman (tel: 0317-486131; e-mail: jantiene.baartman@wur.nl)



Organic carbon export from perennial and intermittent river systems in a Mediterranean environment



Project Description

The objective of this work will be to evaluate the organic carbon export of a Mediterranean river flow and identify its importance in the organic carbon cycle. An existing hydrological and suspended sediment data base will be reorganized to estimate nutrient losses of nested catchments with different hydrological dynamics (perennial and intermittent). Updates of the data base will be carried out with incorporation of new data from fieldwork. Relations between organic carbon loads and catchment characteristics will be explored. The expected results will determine the contribution of the different subcatchments to the total organic carbon export and will identify their importance within the organic carbon cycle of the catchment.

Methodology

Fieldwork, data analysis

Host institute: CEBAS-CSIC, Spanish Research Council – Soil and Water Conservation Group

Country: Spain

Starting date: to be determined

SLM contact person: Jantiene Baartman (0317-486131; jantiene.baartman@wur.nl)



Soil erosion characterization in rainfed cropping systems in SE Spain: main erosion processes and rates



Project Description

The objective is to identify and characterize the main erosion processes taking place in a large agricultural property of extensive rainfed cereals in NW Murcia. With that purpose a combination methodology of (i) field evaluation of main erosion processes and estimation of erosion rates directly in the field and (ii) identification of main erosion processes through cartographic analysis of aerial photographs will be used. The expected results will identify the main erosion processes and rates in relation to agricultural management of the property and will advice over potential soil conservation measures.

Methodology

Fieldwork, Aerial Photo interpretation / GIS

Host institute: CEBAS-CSIC, Spanish Research Council – Soil and Water Conservation Group

Country: Spain

Starting date: to be determined

SLM contact person: Jantiene Baartman (0317-486131; jantiene.baartman@wur.nl)



Nutrient losses by soil erosion processes in rainfed cropping systems in SE Spain



Project Description

The objective is to estimate losses of nutrients due to soil erosion processes and evaluate their economic significance. Source-soils and sink areas of sediments related to the main erosion processes will be identified and sampled. Main nutrients of soil and sediments will be analyzed in the laboratory and nutrient losses related to soil erosion processes will be estimated. Potentially the economic losses related to soil nutrient losses could be estimated. This thesis topic is related to another MSc thesis topic in Spain on characterization of soil erosion processes and rates in rainfed cropping systems in SE Spain.

Methodology

Fieldwork, laboratory work

Host institute: CEBAS-CSIC, Spanish Research Council – Soil and Water Conservation Group

Country: Spain

Starting date: to be determined

SLM contact person: Jantiene Baartman (0317-486131; jantiene.baartman@wur.nl)



Diversification of rainfed cropping systems in semiarid environments: impact on soil physical and chemical properties and erosion rates



Project Description

Diversification of agricultural systems tries to increase the long-term resilience, sustainability and economic revenues of agriculture. In a large agricultural property of SE Spain, a diversification experimental area is just established. Traditional rainfed almond trees are intercropped with an aromatic species (winter thymus) and a culinary species (caper) selected by stakeholders. The objective is to improve soil quality, decrease erosion rates and on a longer term economic benefits. The objective of this work will be to make a first evaluation of the soil condition (physical and chemical properties) and on erosion rates several months after the introduction of the intercrops.

Methodology

Field evaluation, soil sampling, measure of erosion rates in the field, laboratory analysis of main physical and chemical properties

Host institute: CEBAS-CSIC, Spanish Research Council – Soil and Water Conservation Group

Country: Spain

Starting date: to be determined

SLM contact person: Jantiene Baartman (0317-486131; jantiene.baartman@wur.nl)



New-Zealand: Water, salt, mangrove growth



Project Description

Methodology: field work and modeling

Research objective/question:

There is a link between the carbon balance, hydrology and greenhouse gas emissions. In a complex system like mangroves, interdisciplinary research and analysis is required to quantify these relationships. We are looking for a student who is willing to contribute to quantitative research on this topic in a multidisciplinary setting from a hydrological point of view. The topic will be subject to discussion based on the interests of the researchers and the student.

Host institute: University of Auckland

Country: New Zealand

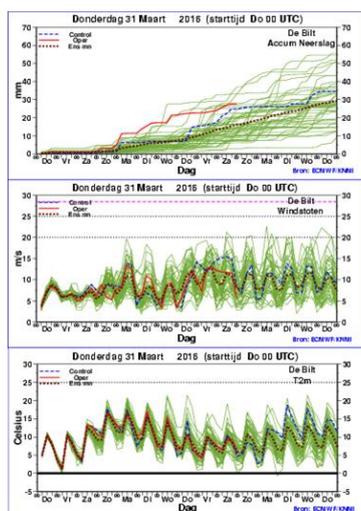
Starting date: Early 2018

SLM contact person: Klaas Metselaar (Klaas.metselaar@wur.nl)

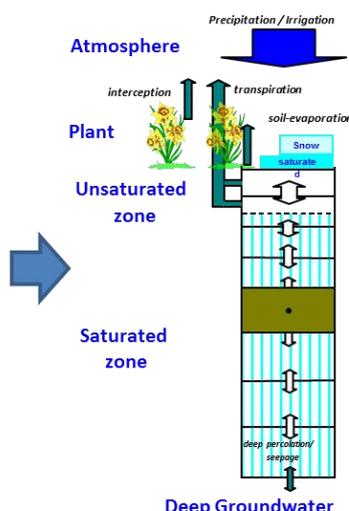


Predicting root water content based on weather forecast ensembles

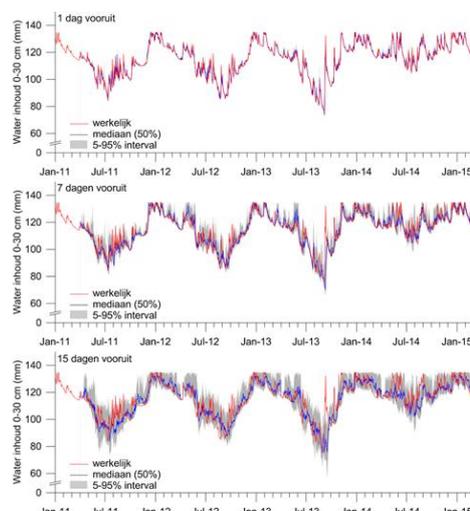
Ensemble weather



SWAP model



Predicted root zone water content



Project Description

Each day weather forecast ensembles for a 15-day period become available. These can be used as input for a soil simulation model to determine the bandwidth of predicted soil water content in the root zone. Such information can be of use for the farmer (when to perform tillage, when to irrigate) or for the water board (expected droughts and floods). Technically this is possible, and for a single test case some results have been obtained. We are looking for some more test runs (different soil types, different crops) to see what information (water content in root zone, drainage, crop yield, crop growth reduction factors, etc.) is the best to consider for potential users of such a tool.

Host institute: Wageningen University and Research

Country: The Netherlands

Starting date: Any time

SLM contact person: Jos van Dam (jos.vandam@wur.nl); **Alterra:** Marius Heinen (marius.heinen@wur.nl)



WaterVision: crop production subject to dry, wet or saline conditions



Project Description

To simulate the effects of hydrology and climate change on agricultural production SWAP (hydrology) and WOFOST (crop growth) are well-known models. They allow a distinction between the effects of dry, wet (oxygen stress) or saline conditions in the root zone. Although both models are well tested and available for use in WaterVision, there are still many questions that could be addressed for a thesis. An interesting topic could be the effect of soil temperature on root development and start of the growing season; another topic could be how to deal with different stresses during the growing season. How exactly does a cold and wet spring affect harvestable yield when the summer months are highly productive? A third thesis topic could involve model testing on datasets from all over the world as part of an international project. Can the SWAP-WOFOST model also simulate crop growth of soy bean? And can we incorporate nutrient management?

Host institute: Alterra/Wageningen University

Country: Netherlands

Starting date: any time

SLM Contact person: Jos van Dam (jos.vandam@wur.nl)



Analysing the revegetation potential of degraded drylands, like Kuwait



Land Life Company is a Dutch startup engaged in dryland reforestation projects. Towards this goal the Cocoon, an incubator for tree seedlings has been developed, enhancing growth conditions towards early tree establishment especially in drier regions.

The proposed research topics focus on the impact of Cocoon-technology on tree or shrub survival, overall growth and long term resilience, considering its implementation in degraded dry lands, like in Kuwait

Possible research topics:

- Soil physical measurements to support mapping of the area indicating revegetation potential
- Monitoring vegetation density and growth using remote sensing techniques
- Assessing the effects of revegetation on micro climate and water availability

Host institute: www.LandLifeCompany.com

Country: Kuwait, or other country with degraded drylands

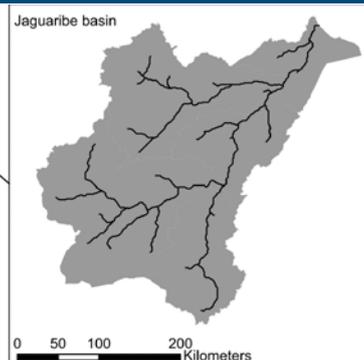
Starting date: Tbd

SLM contact person: Teun Vogel and Coen Ritsema



Water Resources Management

Improving of groundwater resources management in NE Brazil



Short project description.

Problem context:

In the South Ceará (Jaguaribe basin, Northeast Brazil) the use of groundwater resources is regulated according to the following principle: total groundwater abstraction should not exceed average recharge. However, groundwater recharge is highly variable over time and estimating groundwater resources availability involves large uncertainties due to limitations in data availability, model schematizations (e.g. boundary conditions) and model parameter estimations. To overcome this, ideally the epistemic uncertainty of groundwater recharge should be considered in water management. In addition, long-term impacts of different water uses (human supply, irrigation, industry) on groundwater resources availability should be considered. Thus, an improved approach for the management of groundwater resources and their use is needed.

Research questions:

- What is the uncertainty of recharge estimations?
- What are the long-term effects of water abstraction practices by different sectors?
- How can uncertainties be included in water resources management for Southern Ceará, Brazil?

What is expected from the student (type of research)

A recently developed groundwater model will be used to estimate groundwater recharge and its uncertainty. Validation is done using monthly monitoring records of groundwater levels in the region available from the Ceará Water Agency (COGERH).

Host institute(s):

UNILAB - Redenção, Ceará, Brazil (<http://www.unilab.edu.br>)

FUNCEME – Fortaleza, Ceará, Brazil (<http://www.funceme.br/>)

Country: Brazil; Starting date: 2018; WRM contact person: Pieter van Oel (pieter.vanoel@wur.nl)

SLM contact person: Klaas Metselaar (Klaas.metselaar@wur.nl)

MSc thesis research Topics

Land Management & Society





Investigating Social Learning Processes



Social Learning Processes

Living Lands is essentially facilitating a social learning and change process in the Langkloof. There is still much to learn about how to facilitate such processes effectively. We also need to monitor the (learning) impact of our initiatives, so that we can make a case for much significant investment in social learning and change processes.

Monitoring and evaluating the social learning that has and is taking place as a result of the facilitation work that Living Lands is and has been undertaking on the landscapes. This is relevant to the Kouga, Kromme and Baviaanskloof catchments. Research that could inform and strengthen Living Land's efforts to facilitate effective collective social learning on the landscape is needed and would be very valuable.

Host institute: Living Lands and PRESENCE

Country: South Africa

Starting date: To be arranged

SLM contact person: Michel Riksen (michel.riksen@wur.nl)



Investigating Sustainable Farm Redesign in the Langkloof



Sustainable farm re-design

Many of the State owned farmers are in a state of considerable disrepair and have not been used cultivated extensively for many years. Most of the old orchards on these farmers have been removed. Some of the dams have been breached. There is a need to redevelop these farms along lines that would support sustainable food and cash crop production amongst emergent farmers.

1. Redesigning old commercial apple farms (now owned by the State and leased out to emergent farmers) along permaculture lines to support sustainable food and cash crop production (including honeybush) for emergent farmers.
2. Specifically, on the emerging farmers: what are they farming currently? How profitable are their farming businesses? What are their markets? What are their challenges? (If we understand their current situation, it becomes easier to understand whether honeybush is a viable option for them or not)

Host institute: Living Lands and PRESENCE

Country: South Africa

Starting date: To be arranged

SLM contact person: Michel Riksen (michel.riksen@wur.nl)



Fancy contributing to land management research in the framework of an EU project?



The SLM group is heavily involved with a number of large collaborative research projects. Within these, there are ample opportunities to design an MSc thesis research that contributes to the larger research agendas in those projects. In SOILCARE (www.soilcare-project.eu) there are options to do research on decision-making regarding land management, and modelling of the impacts of soil-improving cropping systems. In RE CARE (www.recare-project.eu) cost-benefit analyses of measures to mitigate a variety soil threats (erosion, salinisation, flooding, organic matter decline, etc) are being conducted, from the perspective of individual land users as well as society as a whole. In iSQAPER (www.isqaper-project.eu) we will design an interactive app with stakeholders to assess soil quality information. This brings together large global datasets and local knowledge. Innovative questions surrounding app design or use potential could be explored in a MSc research.

Host institute: Various across Europe

Country: Europe (from Iceland to Cyprus)

Starting date: any time

SLM contact person: Luuk Fleskens (luuk.fleskens@wur.nl)



Effects of soil land management on natural reserves (Mexico)



Campeche, SE Mexico

We are offering 2 master thesis.

- How far can Glyphosate be detected in natural reserves as the result of transport from the agricultural regions where it is applied. Does it accumulate in the food chain and what are the corresponding risks.
- Bioaccumulation of microplastics in the terrestrial food chain

Host Institut: El Colegio de la Frontera Sur, Unidad Campeche

For more information contact: Violette Geissen/Esperanza Huerta
vgeissen@wur.nl; esperanza.huertalwanga@wur.nl



Effects of soil land management on soil characteristics (Groningen, Netherlands)



We are offering 2 master thesis within Horizon 2020 Diverfarming Project. The master thesis combines field work and laboratory work.

The research questions are based on actually needs of the farmers in Groningen who participate in the project as case studies.

The following topics are offered to be conducted

1. Microplastics in composts
2. Microplastics in soils after the use of plastic mulchs and contaminated composts

For more information contact: Violette Geissen/Esperanza Huerta
vgeissen@wur.nl; esperanza.huertalwanga@wur.nl



Effects of soil land management on soil microbiology (Spain)



Within the frame of Horizon 2020 Diverfarming Project,

we are offering 3 master thesis topics:

1. Effect of soil management on microbiology diversity in areas where plastic mulchs are used (field-laboratory)
2. Effect of plastics and pesticides on soil microbiology (laboratory)
3. Effect of plastics and pesticides on soil physicochemical analysis (laboratory)

Host Institut: UPTC

For more information contact: Violette Geissen/Esperanza Huerta
vgeissen@wur.nl; esperanza.huertalwanga@wur.nl



Integrated Land & Forest management with smallholders in the Bolivian lowlands



Sicirec Bolivia Ltda is a social enterprise specialized in integrated forest management, reforestation, agroforestry, conservation, environmental services and innovative financing mechanisms.

Being agriculture one of the main causes of deforestation and soil degradation, *Sicirec Bolivia Ltda*, is developing viable land use alternatives together with smallholders in the lowlands of Bolivia i.e. sustainable forest management, reforestation activities, and "Climate Smart Agricultural" practices. Smallholders combine tree growing with agriculture and Sicirec's expertise assists them in the right site/crop selection and business planning. The integration of tree-planting contributes to climate change mitigation, but is as well a proven climate adaption strategy to increase resilience towards current and future climate change. This will improve the sustainable productivity of farmland, and reduce pressure for further clearing of primary forests. The activities are embedded in, "Integral Farm Management" and "farm business plans", including sustainable financial mechanisms.

The MSc thesis will be carried out in the ArBolivia project areas in one of the following themes:

- Environmental benefits/impacts of reforestation activities
- Socio-economic impact analysis of land-use activities
- Integrated land use/landscape planning as a climate mitigation and adaption strategy and a strategy for rural development

The exact research focus can be defined together with the SLM contact person and host institute.

Host institute: Sicirec Bolivia Ltda, contact person: a.stilma@arbolivia.org

Country: San Carlos, Concepción, Chimoré, Rurrenabaque (to be defined), Bolivia

Starting date: any time

SLM contact person: Aad Kessler (486055; aad.kessler@wur.nl)

More information: www.arbolivia.org www.arbolivia.org.uk



Peru: Using GIS and farmer interviews to analyse land use changes



In Cuzco – Peru, the civil society organization Pachamama Raymi (PR) is since the 1990's working with a methodology aiming at breaking the vicious circle between environmental degradation and poverty. One of the actions of PR is reclamation of degraded soils, which is mainly achieved by planting trees (PR has already planted 6 million trees) and by more sustainable grazing. However, in the area erosion continues on a large scale, and the effects of project such as PR is small.

This MSc thesis will be carried out within PR and aims at developing a GIS-based land use (change) map of the intervention areas of PR, as a basis for future monitoring of PRs actions. In several selected areas a survey will be carried out to analyse land use changes: drivers, farmers' perspectives, possible practices, etc. This profound analysis will contribute to a better understanding of the effects of PR on combating land degradation in the PR villages and watersheds, and options to improve. The research requires good knowledge of Spanish, classes can be taken in Cuzco if needed.

Host institute: Larry Oruro, <http://pachamamaraymi.org/>

Country: Cuzco, Peru

Starting date: any time

SLM contact person: Aad Kessler (486055; aad.kessler@wur.nl)



Netherlands: Further developing the African Highland Farmer game for Dutch schools



LOW MARKET PRICES
Because of over-production in the region, market values for your crops were low. You receive 10% less income from the harvest of all your crops except coffee.

ANNUAL SUMMARY

YEAR 1/15 HOUSEHOLD 2 ADULTS + 2 CHILDREN SAVINGS 6,000 SHS

INCOME					EXPENSES				
CROPS	Sell Price	Area	Soil	Loss	= Income	Sell Price	Area	+ Pesticide	= Expenses
MAIZE	3.200	0%	60%	10%	0 SHS	MAIZE	600	0%	0 0 SHS
BEANS	3.750	0%	60%	10%	0 SHS	BEANS	500	0%	0 0 SHS
SW.PEPPER	13.290	30%	60%	10%	2.152 SHS	SW.PEPPER	1.340	30%	0 402 SHS
TOMATO	7.500	40%	60%	10%	1.620 SHS	TOMATO	660	40%	0 264 SHS
COFFEE	5.090	0%	60%	0%	0 SHS	COFFEE	5.700	30%	0 1.710 SHS
LIVESTOCK INCOME					500 SHS	LIVESTOCK COSTS			300 SHS
LABOUR INCOME					2.800 SHS	LABOUR COSTS			0 SHS
CHILD PENSION					0 SHS	LIVING COSTS			6.600 SHS
						EDUCATION			0 SHS
						MALARIA			200 SHS
						ILLNESS			0 SHS
TOTAL INCOME					7.072 SHS	TOTAL EXPENSES			9.476 SHS

TOTAL 3.596 SHS

CONTINUE

The African Highland Farmer game (<http://www.weirdbeard.nl/dev/ahf/>) was recently developed within the SLM group, and included in the MOOC on Soil4Life. At the same time the game was brought under the attention of Dutch schools, both in Geography (Aardrijkskunde) and Biology lessons. First experiences have been very promising, and now it is time to further develop the game into a package with Modules in which high school students learn more about soil, water and agricultural aspects of African farming, and the difficult livelihood choices these farmers face. This MSc thesis will therefore focus on developing these Modules, testing it on several high schools (classes VWO 4/5) and link research questions to it which are still open but could focus on "mindset change" in the students concerning food production (in Africa), their engagement with African farmers and the food they buy proceeding from Africa, and their perspective on (global) development issues. This thesis will be done in collaboration with other WUR chair groups, especially in the Education corner, so having done the Minor Education would be a real advantage for doing this thesis.

Host institute: Wageningen University

Country: Netherlands

Starting date: any time

SLM contact person: Aad Kessler (486055; aad.kessler@wur.nl)



Peru: Understanding adoption of improved (forage-based) fallows in the Andes



The Andean highlands have been under cultivation for millennia, but growing demand for food, agricultural modernization, and climate change have led to intensification and has shorted fallow cycles. Participatory research towards the development of improved fallow options (via introduction of adapted pastures and legumes) appears to offer farmers the ability to enhance forage production, while potentially accelerating soil fertility restoration. However, little is known about what community or farmer attributes drive adoption of these systems. The objective of this research is therefore to understand how household characteristics and livelihood strategies determine research participation and eventual adoption of improved fallow options.

We seek a student who will be based in Huancayo, and work together with local and international researchers to evaluate community trends and drivers that determine adoption. The student will participate within the second phase of a participatory research project, and needs to have at least a moderate level of Spanish language skills and be able to work effectively in a team.

Host institute: Steven Fonte (PhD student) at Colorado State University

Country: Huancayo, Peru

Starting date: any time

SLM contact person: Aad Kessler (486055; aad.kessler@wur.nl)



Land rehabilitation in and around refugee settlements in Uganda: training and for adoption of SWC measures



As a result of conflicts in Southern Sudan, refugee settlements in Uganda are growing rapidly, resulting in high pressure on available resources in and around the settlements. Training and awareness raising are key to foster good land stewardship in the settlements, increase adoption of SWC measures, and enhance local food production. The PIP approach as applied in Burundi with smallholder farmers can be a very helpful strategy to foster the establishment of small vegetable gardens in these settlements. In order to explore the current situation and provide input for a food security programme, we need a MSc student for an explorative research, in which specific research questions are still open. Focus is on:

- Assessing land degradation status and refugees' visions on their plots and future
- Devising (land use) plans for implementation of SWC measures
- Cooperation with diaspora from semi-arid and arid regions to develop training plans;
- Opportunities for agribusinesses (nurseries, seed production, tool factories)

The student must be willing to stay and live for about 2-3 months in the settlement.

Host institute: Wageningen University

Country: Northern-Uganda

Starting date: September 2018 onwards

SLM contact person: Aad Kessler



Comparing post-fire management policy frameworks and stakeholder experiences in Portugal and Galicia, Spain



Wildfires are well-known to enhance runoff generation and the associated transport of sediments and nutrients, especially during the early stages of soil and vegetation recovery. These enhanced runoff and erosion rates can be mitigated quite effectively by so-called post-fire emergency stabilization measures and, in particular, by the application of organic residues on the soil surface, as was observed in a series of field experiments. In different fire-prone countries, policy and legal frameworks vary in the requirements for land owners and managers to undertake post-fire management actions, and the incentives and support provided to them. This research would undertake a comparative research to compare the development and implementation of specific interventions (objectives, stakeholders involved, costs and resources, etc.) and experiences in Portugal and Galicia. Semi-structured interviews or questionnaires can be applied to different stakeholders for this purpose. Further attention can also be given to reviewing experiences in other countries such as USA and Australia.

Host institute: University of Aveiro (Sandra Valente, Cristina Ribeiro)

Country: Portugal

Starting date: any time

SLM contact person: Luuk Fleskens (485467; luuk.fleskens@wur.nl)

MSc thesis research Topics

Interdisciplinary research





Monitoring the impact of large-scale landscape restoration through Farmer Managed Natural Regeneration (FMNR)



Justdiggitt (justdiggitt.org) is a kick-start organisation that works towards the large-scale greening of degraded lands on the African continent. In Tanzania's Dodoma Region, Justdiggitt works closely with LEAD Foundation to achieve this vision through FMNR. MetaMeta is involved to implement the M&E framework for the project.

Possible MSc. thesis topics:

- Carbon sequestration mapping: how can carbon sequestration best be mapped through remote sensing, and what historical changes can be observed for Tanzania's Dodoma region in the last 15 years?
- Water, vegetation and livelihood benefit projections: what methods can be developed to quantify expected project outcomes for different impact metrics? (Water: how many litres are additionally retained? Vegetation: how much carbon is additionally captured? Livelihoods: what yield increase can be expected?)



Host institute: MetaMeta Research in collaboration with Justdiggitt Foundation and LEAD Foundation

Country: Tanzania

Starting date: March 2018

SLM contact person: Michel Riksen



Monitoring the impact of large-scale landscape restoration through Farmer Managed Natural Regeneration (FMNR)



Justdiggit (justdiggit.org) is a kick-start organisation that works towards the large-scale greening of degraded lands on the African continent. In Tanzania's Dodoma Region, Justdiggit works closely with LEAD Foundation to achieve this vision through FMNR. MetaMeta is involved to implement the M&E framework for the project.

Possible MSc. thesis topics:

- Institutional landscape assessment: there is a need to better understand the natural resource management-related rules, regulations and institutions from the local to the national level. What 'traditional' and 'modern' rules and institutions determine the way in which natural resources are managed (Kongwa + Mpwapwa districts). How can project activities best align to the institutional context?
- Impact assessment: what can be learned from LEAD Foundation's approach to Farmer-Managed Natural Regeneration, and (how) has this influenced livelihoods and perceived ecosystem benefits in four target communities around the Kiboriani Mountains? How could the impact be quantified through participatory methods?



**META
META**



**LEAD
FOUNDATION**

Host institute: MetaMeta Research in collaboration with Justdiggit Foundation and LEAD Foundation

Country: Tanzania

Starting date: March 2018

SLM contact person: Michel Riksen



Investigating the use of silt traps in land restoration



Silt traps

- What is the water retention capacity of silt traps/rock stack?
- What is the water infiltration/retention rate?
- Is there a difference in plant recruitment within and outside of silt traps/rock stacks?
- Are there any differences in plant recruitment in silt traps/rock stacks that are brush-packed vs silt traps/rock stacks that were not?
- What is the rate of siltation? How long does it take for a silt traps/rock stacks to silt up?
- Do silt traps/rock stacks increase the success rate of spekboom survival?
- Do silt traps/rock stacks increase the success rate of seed growth and recruitment?
- What is an effective number and distribution of silt traps/rock stacks across a degraded landscape?

Host institute: Living Lands and PRESENCE, Maya Beukes (maya@livinglands.co.za)

Country: South Africa

Starting date: To be arranged

SLM contact person: Michel Riksen (michel.riksen@wur.nl)



Can reseeding be effectively used in restoration of degraded lands



Seeding

- What are the five most suitable grasses and five most suitable shrubs species to be used in the restoration of lowlands areas
- What are the five most suitable grasses and five most suitable shrubs species to be used in the restoration of hillslopes
- How does soil condition influence seeding success? Which species are most resilient for use in restoration of degraded lands?
- How does reseeding success compare to replanting?
- When and how can the 10 most suitable species for rehabilitation seeding be harvested locally (So that we can engage the local community in harvesting for us and purchase these locally).
- How much seed is needed per planting method?

Host institute: Living Lands and PRESENCE Maya Beukes (maya@livinglands.co.za)

Country: South Africa

Starting date: To be arranged

SLM contact person: Michel Riksen (michel.riksen@wur.nl)



Various Topics Related to Cover Crops and Organic Farming



Various Topics Related to Cover Crops and Organic Farming in the Baviaanskloof

1. What is the impact of different cover crops on the farming systems we work in (e.g. honeybush, apples, lavandin, rosemary, etc.)
2. What is the impact of no-till farming in the farming systems we work in (especially in the Baviaanskloof)
3. Long term cost savings/decreased costs from composting on farms
4. What is the total water impact of sustainable agriculture versus traditional agriculture
5. What is the impact on the soil life/soil health from new cultivation practices (lavender/rosemary)
6. What are other indigenous crops which can be used for essential oils/medicinal, what are their traditional uses, where do they grow, are they already cultivated, what is their oil/dried yield?
7. A feasibility study of growing locally indigenous plants for medicinal purposes, investigating new potential medical plants through engagement with the local community using/ capturing indigenous knowledge.

Host institute: Living Lands and PRESENCE Maya Beukes (maya@livinglands.co.za)

Country: South Africa

Starting date: To be arranged

SLM contact person: Michel Riksen (michel.riksen@wur.nl)



Investigating the effects of climate change in the Baviaanskloof and Langkloof



Climate change

- What are the effects of climate change on the landscapes of the Baviaanskloof and Langkloof: have climate-related risks changed over time? (building on what CSIR/WWF/Santam etc. have already done?)?
- If there have been changes, how much? How do we measure them going forward?

Host institute: Living Lands and PRESENCE

Country: South Africa

Starting date: To be arranged

SLM contact person: Michel Riksen (michel.riksen@wur.nl)



Various topics related to agricultural services and value adding business models



Various Topics Related to Agricultural, Service, Restoration and Value Adding Business Models in the Langkloof

Living Lands is working with the landscape stakeholders to explore innovative business models, collaborations and partnerships that could more effectively support emergent farmers and BEE ventures and create a more diversified and sustainable rural economy.

1. Research to inform the development of viable business models for farmers, service businesses as well as environmental restoration and value adding businesses.
2. Exploring, comparing and evaluating different ways of making productive and economic use of the wood from the clearing of IAPs in the Kouga and Kromme catchment. Assessing business development options for such projects. The potential use options under consideration include producing mulch, compost, biogas and charcoal.
3. Unpacking the 'financial impact' on the farmers: does our project increase the value for their use specifically on water quality? (This can help us make a case for less use of pesticides)
4. Impact of soil mycorrhizae/soil organisms on yields on fields under cultivation.
5. How to use value created for farmers? Do you pay them in cash? Do you build a hospital (for instance?) or do you re-invest it into their farms? Other examples? E.g. study to look at comparable projects

Host institute: Living Lands and PRESENCE

Country: South Africa

Starting date: To be arranged

SLM contact person: Michel Riksen (michel.riksen@wur.nl)



Use of marginal water in irrigated agriculture



Due to water scarcity, in many regions worldwide use is made of marginal water for irrigating crops. Use of such water (slightly saline, treated waste water or effluent) may lead to salinization, sodicity, and contamination of soil with a range of pollutants. Under this topic, the focus is flexible and may involve the investigation of salinity or sodicity in field locations in Tunisia. It is also possible to investigate the impact of marginal water on soil, crop, or groundwater contamination, on ways to prevent these adverse effects, and approaches to remediate degraded soil. Besides field investigations (if available at that time), also laboratory experiments are possible (in Wageningen). Currently several projects are conducted in the Netherlands, where treated domestic waste water is used in combination with subsurface irrigation and adaptive drainage. Suggestions for extensions towards end-users or governance aspects with other staff are welcome.

Field site in Tunisia

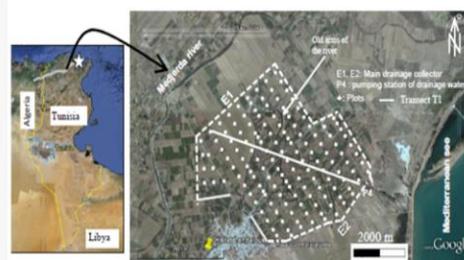


Figure 1. Kalāat Landalous irrigated area and measurement sites.

Host institute: National Institute for Research in Rural Engineering, Waters and Forests, Box 10, 2080 Ariana

Country: Tunisia

Starting date: to be determined

SLM contact person: Sjoerd van der Zee



Bolivia: several topics related to watershed management and SLM



In Bolivia the SLM group has a long tradition of BSc and MSc thesis research with Helvetas Swiss Intercooperation, supervised by an ex-PhD student (Carlos Saavedra) now working for Helvetas. For Spanish speaking MIL students, or those willing to learn the language, there are now several MSC research opportunities in different Departments of Bolivia. Topics are still quite open and can be discussed, and can be biophysical, sociotechnical or a combination of both!

Title	Department	Duty station
Sustainability analysis of the performance of the watershed committees , focusing on aspects such as collaboration, concrete SLM activities, and impact of land and water management in the watersheds.	Cochabamba and La Paz	A study with base in La Paz and several trips to selected watersheds in Cochabamba y La Paz
A study focused on changes in behavior in families and communities involved in LWM in selected micro watersheds in two departments, and how this affects sustainable land management.	Cochabamba and Chuquisaca	Cochabamba, nice city in the middle of Bolivia (known for its eternal spring)
An analysis of watershed management practices and their contribution to climate adaptation and mitigation, emphasizing effects on carbon sequestration , with a combination of fieldwork and analysis.	Chuquisaca and Cochabamba	Cochabamba and Villa Serrano in Chuquisaca

Host institute: Helvetas and related NGOs (Carlos Saavedra)

Country: Bolivia

Starting date: any time

SLM contact person: Aad Kessler (486055; aad.kessler@wur.nl)



Salinity, sodicity and remediation



One of the most wide-spread soil contamination problems worldwide is salinity (too high salt concentrations) and sodicity (too high concentrations of sodium: Na^+). Whereas salinity causes crop yield depressions and dying natural vegetations, sodicity leads to (often irreversible) soil structure deterioration with poor aeration and water flow in soils, as well as erosion. Agriculture has to avoid these problems by adequately managing groundwater, irrigation water, and adding materials as organic matter or lime to improve already degraded soils.

In this topic, it is possible to do research for your MSc thesis that addresses important processes involved in salinity and sodicity. This may entail laboratory experimentation (batch and column studies with water containing different salts), but also computer simulation using the codes of the HYDRUS series. To a limited degree, it may be possible to conduct research in the field, if our counterparts (e.g. in Netherlands, Tunisia, or elsewhere) have on-going projects. In case of an experimental focus, the results also will require some modeling in the interpretation (statistics, excel or R-calculations).

If you wish to combine natural sciences with socio-economic aspects, this is an option that can be explored.

Host institute: options in NL, Tunisia, Australia, China depend on availability

Country: various

Starting date: depends on availability

SLM contact person: Sjoerd van der Zee



Soil physical properties of weed infested vs. weed free areas

Part of project on Non-chemical weed control for sports turf



Project Description

Sports fields and golf courses can have many advantages for human and environmental health and wellbeing. However weeds can seriously interfere with the playing quality of these areas – and are also hosts to pests as well as being unsightly.

Historically, weeds on sports fields and golf courses have been treated with herbicides. However, as part of the Dutch government's 'Green-Deal 2020', use of chemical pesticides including herbicides on turfgrass areas will be forbidden in order to move the turfgrass industry toward a greener and more sustainable future. The European Union has also placed restrictions on turfgrass herbicides. Hence, development of chemical-free management strategies for strong, weed-free playing surfaces has a high priority for the sectors.

It is recognized that the best way to control weeds in turfgrass stands is to promote the growth of healthy, dense turfgrass that outcompetes the weeds. Specific recommendations for this is the overarching goal of the larger project to which this thesis topic is related. Along with turfgrass species selection, plant nutrition and mowing practices, soil conditions and soil management are key factors in not only promoting dense turf, but also in weed occurrence and management. Soil data from weed infested and weed free areas will contribute to better understanding the role of soil conditions and potential for soil management as part of chemical-free weed control.

Methodology

Alongside (an)other scientist(s) who will be investigating various mowing and fertilisation practices to encourage strong grass growth that out competes weeds, you will create an analysis of the soil physical conditions in the area of the test plots and possibly selected other areas on 2 Gelderland golf courses, Golf course 'The Dutch' – host of the KLM Open 2017 and the Golf course/golfclub Heelsum. The project will involve field work, lab work and literature/internet study.

Research objectives/questions

Among other things that you will elaborate in your proposal, you will create data on the soil conditions and associated weed species in areas sampled, you will document the current knowledge and recommendations on soil/weed relations in turfgrass, you will look for correlation between field conditions and the literature, and draw conclusions and make recommendations for further research.

Host institute: Wageningen University, Crop System Analysis

Country: The Netherlands

Starting date: ASAP

SLM contact person: Coen Ritsema (coen.ritsema@wur.nl) / Demie Moore (demie.moore@wur.nl)



Uganda: Sustainability and options for scaling-up of permaculture.



At Priceless farms in Uganda, next to lake Kyoga, permaculture is brought into practice not only focussing on the farm itself, but taking the whole surrounding community into account and giving new opportunities for refugees.

Uganda's population growth rate is over 3.4% and this has led to increasing land scarcity and food insecurity. Many Ugandan refugees (from recent war conflicts) are found landless. Next to this, most of the forests and areas surrounding the farm have been cleared to grow crops and to make charcoal, and the destruction of forests on private land coupled with land scarcity has led to further encroachment of forest reserves and wetlands.

The Priceless farm exploits new opportunities for sustainable agriculture, living environments and social cohesion, with a strong focus on agroforestry, reforestation and increasing crop production. This creates diverse possibilities for MSc research!!

MSc research topics in Uganda can focus on building a reliable case study around the farm with either a biophysical or socioeconomic focus or a combination of both, depending on the interest of the student. Uganda is a country of rapid changes where SLM is high on the agenda, and where North/South collaboration is essential. A WUR researcher based in Kampala supervises the theses offered here.

Host institute: Priceless farms, Wageningen University (Laurie van Reemst)

Country: Uganda

Starting date: Any time, but preferably ASAP (e.g. March-May 2017)

SLM contact person: Aad Kessler (486055; aad.kessler@wur.nl)



Rainwater harvesting in the West Bank, Palestine



In the West Bank, Palestine, water shortage is a dominant problem. The water supply-demand gap is still increasing due to the increasing water demands for different uses, among which domestic and agricultural are the most important. Despite the increasing water shortage, rainwater is being lost in winter due to the lack of water storage infrastructures, and the Palestinians should explore rainwater harvesting (RWH) as an option. The main objective of the MORwater project is the individual and institutional attitude change of different stakeholders toward the importance of adopting RWH as a viable strategy to satisfy water needs for domestic and agricultural uses. Within this project we have room for 2 – 4 students.

Main tasks will be: to assess and evaluate existing RWH techniques in the region; identification of the potential RWH sites and technologies; to study the economic feasibility of RWH techniques; and to explore the scope for adoption of RWH techniques.

Besides local supervision MORwater will offer you some financial support.

Project name: MORWater

Host institutes: ANU (Dr. Sameer Shadeed, sshadeed@najah.edu) and BZU (Dr. Marwan Ghanem, mghanem@birzeit.edu)

Country: West Bank, Palestine

Starting date: As soon as possible

SLM contact person: Michel Riksen (Michel.Riksen@wur.nl) or Luuk Fleskens



Conservation agriculture to increase climate change resilience in the Caribbean



The Small Developing Islands States (SDIS) in the Caribbean are currently facing changes in climate in different ways. Research in similar rain-fed agriculture situations clearly demonstrate the potential for agriculture systems to achieve yield increase, crop diversification and improved soil quality simultaneously through conservation agriculture (CA) practices. A joint project with WUR and CARDI is trying to determine how CSA principles can be applied to agriculture in the Caribbean to preserve and enhance production and income in a changing climate. Climate change adaptation is key topic in this and the project - which is expected to get started soon - aims to: 1) further investigate the potential for CA practices to sustainably increase agricultural productivity; 2) establish safety parameters for herbicide and pesticide management in CA for safe food; 3) build capacity in establishing, strengthening and maintaining commodity innovation platforms to foster market linkages and demand-led production; 4) employ suitable post-harvest technology and mechanisms to reduce post-harvest losses and; 5) identify high risk erosion sites through remote sensing technology to, develop location specific conservation agriculture practices to reduce the likelihood of soil erosion on agricultural slopes.

Potential Research topics include:

- Enhancing the productivity of agriculture in a changing climate: a combine strategy for sustaining food production, increasing farm income and ensuring climate resilience.
- Conserving agricultural resources for sustainable development: combining UAV technology and CA practices to reduce the likelihood of soil erosion on agricultural slopes.
- Leveraging ICTS to bridge the gap between agricultural producers and retailers to sustain economic growth.

Host institute: Caribbean Agricultural Research and Development Institute (CARDI), Kistian Flemming

Country: St. Kitts and Nevis (and possibly Antigua, Dominica and others)

Starting date: To be determined

SLM contact person: Teun Vogel (or Martine van der Ploeg, depending on subject)



Land restoration implementation plans for transforming the Grimaldi Property in Italy into a lush green area



The Grimaldi property is a 15 hectares hillside area located in Italy right beside the border with France, adjacent to the Mediterranean Sea. The area is strongly affected by regular wildfires and subsequent soil erosion processes. As a result, the area lost the majority of its original vegetation, is strongly degraded by rill and gully systems and runoff water and transported sediments are released directly into the adjacent Mediterranean sea.

In the past few years, detailed plans for restoration have been developed by WUR. Students could assist in the implementation phase, as well as investigating the effects of the proposed measures.

Possible research topics:

- soil characteristics analysis and the effects of SWC measures
- gully research
- restoration and greening plans: How could this take place? Which species will be suitable to stop erosion?
- irrigation design to meet plant requirements

Host institute: WUR in cooperation with Cambisol

Country: Italy / Monaco

Starting date: Summer 2018

SLM contact person: Teun Vogel



Scenarios of land degradation and restoration under climate change in Madagascar



Land degradation in different forms (deforestation, landslides, soil erosion) is a huge problem in Madagascar. WU-SLM is coordinating a project funded by the World Bank to provide technical assistance in Madagascar (LAUREL), to support integrated decision making for landscape management across sectors and levels of government. The program is based on the principle that improved tools for land use planning will result in more informed and evidence based decision making around long term sustainable use of landscapes, which in turn will result in improved resilience and landscapes' ability to deliver ecosystem services in general and development benefits in particular. A prototype land use change simulation platform is being developed to assess the consequences of alternative decisions (primarily investment) on the achievement of development objectives (e.g. food security) and environmental objectives (e.g. forest cover, carbon storage). Different intervention scenarios will be defined. This thesis research could evaluate the performance of interventions under climate change. Work will include developing and applying scenarios to run on the prototype simulation platform, and to assess the results in collaboration with relevant stakeholders.

Host institute: possibly WWF

Country: Desk study / Madagascar

Starting date: any time

SLM contact person: Luuk Fleskens (luuk.fleskens@wur.nl); Jantiene Baartman (jantiene.baartman@wur.nl)