Bodemkunde in het Onderwijs

Wietse Wiersma



Introductie



PhD project



Cadmium threatens farmer livelihood and regional peace and security Cadmium levels of 50% of LAC beans are too high for buyers

Total cacao



Fine flavour cacao



LACRest

Problem statement

Cacao originates from Latin America and the Carribean (LAC)



Wetenschapscommunicatie

- Discussiegroep
- Blog
- Krantenartikel





Personal involment in research

Researchers are humans, who despite their professional focus on objective data and rigorous collection of evidence, are also moved by internal motivations. Defining such personal involvement with our research takes reflection, yet it is worthwhile as it shows why we work on certain questions, or apply certain methods.

Discussion Group Sustainable Cacao & Coffee



European Researcher Night

- MSCA programma voor wetenschapscommunicatie
 - Educatie & entertainment over onderwerp
 - Stimuleren carrière in wetenschap
- Laatste vrijdag van september + pre/postevenementen
- Budget €300.000 (twee jaar)

Horizon Europe





DIFFUSE: DIGGING FOR THE FUTURE THROUGH SOIL EDUCATION

EU gaat voor duurzaamheid. Missie "Bodemgezondheid en voedsel"

Veerkrachtige, inclusieve, democratische maatschappij. Beweging "[...] blend sustainability, accessibility and aesthetics to make the European Green Deal a 'tangible' experience, by exploring innovative, co-created solutions to complex problems"

Studenten (10-14 jaar) kennis laten maken met bodems en bodemonderzoek, zodat beide toegankelijker worden en publieke steun voor bodemconservatie en –bescherming vergroot wordt

2022: Diversity in soil health

Researcher at School

Researchers from the Wageningen University Soil Science Cluster (PhD, post-doc, staff) visit schools to talk about research, soils, society and our relation to land.

Defining hypothesis

1

Themes

Through learning about researchers' lives and their work on soils, pupils will learn to ask questions and formulate ideas based on existing knowledge. Soil Health Kit

2

collection

data

and

Experiment

<u>2022</u>

Instructions to measure soil properties, including **Chemical** (pH), **Biological** (earthworms) and **Physical** (infiltration).

<u>2023</u>

Material for home "**pot experiment**" including (1) Collecting contrasting soils, (2) Applying fertilizer and seeds and (3) Measure grass harvest

Pupils gather data on soil diversity in different locations and land uses (grass and forest). Next year they will do an experiment that shows the effect of soil diversity on agricultural productivity. 3

context

and

Discussion

Researcher Night

Pupils and their families visit WUR campus. A tour will feature:

- Experimental farms
- Laboratories
- Wageningen Soil Museum
- Workshop & miniconference

Similar to a scientific conference, pupils will bring their data and add it to the database and soil map. They will learn more about the context of their data and broader research efforts on soil diversity and agriculture.



Soil & Culture

- Bodems zijn letterlijk en figuurlijk onzichtbaar
- Dialoog aan het oppervlak over het belang van bodems
- Doel is het ontdekken van de relatie bodemmaatschappij als aantrekkelijke manier van communicatie en educatie over bodems
- Bodems zijn er in het licht (kunst, literatuur, cinema) en in het donker (oorlog, ziekte, slavernij)





Topic Description	
Soil and Arts	
Art	Soil is used both as the material to make art (e.g. colour paint, clay) and as an object to be depicted (e.g. as part of a landscape).
Literature	In literature soil can be prominent as a topic, and it can also be described in engaging ways. Specific focus could be e.g. Walt Whitman, Steinbeck or Dracula.
Language	The way we talk about soil in terms of for example choice of words ('dirt', 'mud') and proverbs and sayings can tell a lot about our perception of soil.
Cinema	Few movies evolve explicitly around soil (e.g. The Woman in the Dunes), but more often soil can be seen (e.g. in animation, Bugs) or has a metaphorical function.
Glass & Ceramics	Soil forms the basis of several materials that are used in an artistic way or that are used in daily life, thus being soaked with stories.
Soil and Identity	
Religion	Major religions such as Christianity and Islam have early references to soil and life (e.g. the literal translation of 'Adam' as 'soil' in Hebrew). More in general, peoples around the world acknowledge
	soils as a divine source of life.
Relations to soil	The relation soil scientists have with soil is often based on curiosity. However, there is a wide variety of relations to soil other than those based on religion.
Sense of place	Representing an important part of 'land'(scapes), soil can be seen in relation to a sense of home or rootedness experienced by people.
Perception of soil	How do people perceive soils? Negative connotations to soil in combination with the inherent invisibility of soils could strongly influence how people perceive soil.
Soils and Darkness	
War	Strategies in (and perhaps even reasons for) warfare are based in part on the condition of the soil.
Slavery	Slaves worked the soil and also ingested it, for example to alleviate pain. Eating of soil by slaves has even been mentioned as a common way to commit suicide.
Death	The earth below the surface perhaps becomes most visible when someone is buried. In several cultures people are 'brought back' to the soil, after which that place become the source of emotion.
Disease	Soils host organisms that can cause diseases in humans upon contact with bare skin or through consumption (e.g. parasitic worms).
Colonialism	Environmental worldviews and perceptions of soil (e.g. by the ancient Mayas) have been intruded by colonisers. It is an important question to what extent these views and ideas survived colonization.
Crime	Prints in the soil (e.g. of boots, car tires), the colour of dust Soil has featured for example in the Sherlock Holmes books: soil in solving crimes.
Soil and Consumption	
Geophagia	Unintentional (e.g. children) or deliberate eating of earth; most common form of pica (craving for ingestions of substances that is uncommon in kind or quantity).
Nutrition	For animals and humans soils could have nutritional value, or other positive effects on the body (depending on the trade-off with adverse effects).
Cosmetics	Some properties of soils make them suitable for cosmetic products, for example the use of mud masks for a smooth skin.
Health	Soil is extremely heterogeneous and contains and immense amount of organisms living in it. Soil has interesting relations with medicine, e.g. antibiotics or the exchange capacity of clays.
Soil and Politics	
Policy debates	There are moments when soils are explicitly part of policy debates, perhaps most famously related to the Dust Bowl in the US, but there are also political dimensions to international efforts to preserve
	soils (e.g. the UNCCD).
Soil maps	All maps are political. Landscape maps can be used to depict land in a certain way; this may also happen to soils. What is the importance of different soil classification systems and the predominance
	of for example the WRB?
Energy	Soil has intricate relations with energy, either fossil or renewable. Nutrients are produced and distributed at high energy costs.
Gender	Soil and earth are at times associated with motherhood and fertility; soil is in many ancient (Egyptian, Greco-Roman, Russian) narratives of the female gender.
"Sons of the Soil"	Conflicts between (large numbers of) arriving migrants and ethnically distinct 'local' or 'native' populations are commonly called 'Sons of the Soil' (SoS) conflicts.
Soil and Past and Future	
Mars	Recently NASA landed on Mars to do research on traces of life, where the soil plays a role. What should we be looking for when exploring 'soil' on a planet?
Archaeology	Soils themselves can give archaeological information. The soil type and quality can influence the preservation of ancient objects (e.g. in bogs).
Artificial soil	Artificial soil can be used to study soil processes in carefully controlled settings, or could contribute to achieving food security. What are the implications of this?
The origin of life	It is most commonly heard that life started in the water. Could it have started in the soil? Soils are certainly much more heterogeneous. With all that diversity, could the chances have been higher for
	life forms to develop there?
Soil in Abstraction	
Philosophy	Exploring how soil is present in philosophy, for example in the tradition of 'vitalism' or 'holism'; could also be an exploration of specific philosophers.
"Soilscapes"	Landscape refers to an area and also relates to its appearance (to the observer). Similarly, Appadurai defined cultural flows like 'etnoscape', 'technoscape' and 'ideoscape'. How can we look at soils
	with such a wider perspective?
Soil "Quality"	Within the soil science community, defining soil quality if the topic of ongoing debates. How can we think of 'quality' in relation to soil?

Soil & Culture

Ontwikkeling

- In de conceptfase, uitwerking volgt komende maanden
 - Colleges, discussiegroep en een essay
- Keuzes moten gemaakt worden
 - **Doelgroep**: studenten, wetenschappers, beleidsmakers, algemeen publiek
 - **Soort vak**: vrijekeuzevak, MOOC, Studium Generale

Leerdoelen

- Na deelname aan het vak kunnen deelnemers
 - Een breed publiek inspireren over de prachtige complexiteit van bodems
 - Een overzicht geven van de links tussen bodem en cultuur
 - Reflecteren op persoonlijke relatie met bodems
 - De link bodem-cultuur gebruiken in wetenschapscommunicatie

Visie bodemeducatie en -communicatie



Visie

- De boodschap: bodemeducatie is leuk én essentieel voor een duurzame toekomst
- Verbindt de persoon aan het onderwerp
- Wees bewust van het gevaar van één verhaal
- Bodems zijn meer dan biofysische matrices

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