HET STIMULEREN VAN MORELE REFLECTIE BIJ TOEKOMSTIG BIOLOGEN

\\

WIEKE BETTEN & VIRGIL RERIMASSIE

synenergene
Responsible Research and Innovation in Synthetic Biology

VU University Amsterdam

Rathenau Instituut

iGEM

PHOTO by JUSTIN KNIGHT | IGEM FOUNDATION

➔ SYNTHETISCHE BIOLOGIE

- opkomend interdisciplinair onderzoeksveld
- (her)ontwerpen van biologische systemen
- beloftes & risico’s
- maatschappelijke & ethische vraagstukken.

PHOTO by iGEM TU_DARMSTADT 2014

➔ AANSLUITING NIEUWE ONDERZOEKSPRAKTIJK

- RRI: democratisering technologie ontwikkeling
- Veranderende rol wetenschapper: verantwoordelijkheid, communicatie, financiering, transdisciplinair
- Ethiekonderwijs aan bèta-studenten: inspelen op deze veranderende rol
- Daarnaast: hoe beklijft ethiek onderwijs het best?

PHOTO by JUSTIN KNIGHT | IGEM FOUNDATION

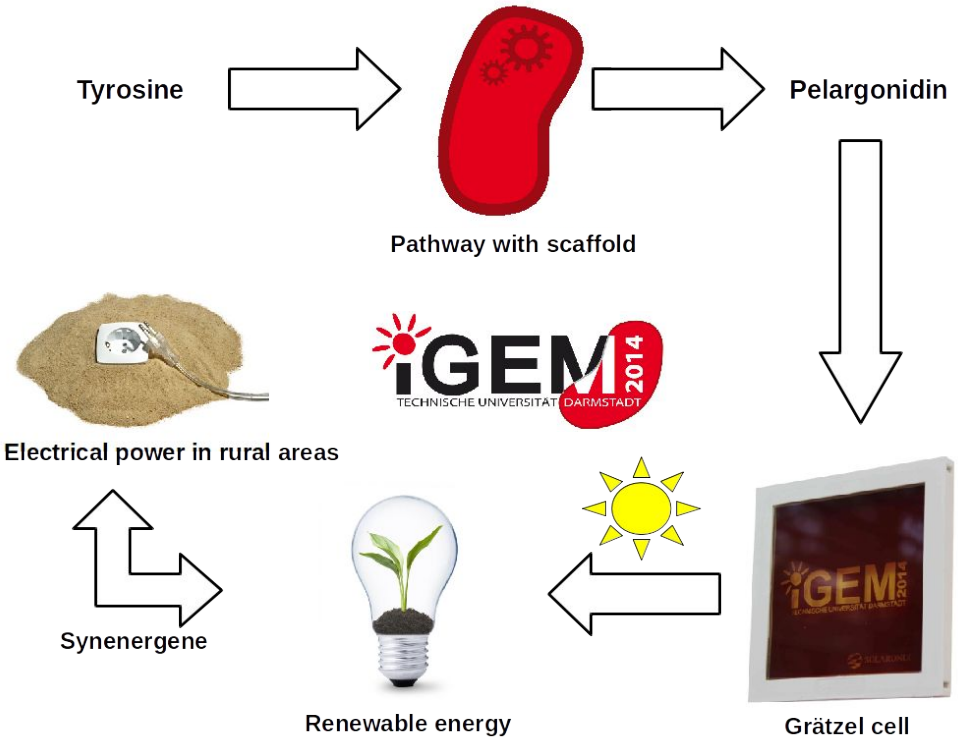
ONS EXPERIMENT

8 iGEM teams // 2 handleidingen // 2 coaches // heel veel Skype gesprekken // 1 giant jamboree // 2 workshops // 8 exit interviews

APPLICATIESCENARIO'S

PHOTO by THOMAS BRAULT

HET PROBLEEM/DOEL	Stakeholders Visies op probleem & oplossing Bijdrage project aan probleem/doel Alternatieven/competitie	Probleem boom Stakeholder map
HOE WERKT HET?	Functionaliteit & technische specificaties Design: onderdelen en geheel Gebruikers: wie, & waarvoor	Functieboom Flow charts Storyboard creating a persona
DESIGN IN CONTEXT	Product life cycle Opschaling Markt Supply chain en materialen Locatie & logistiek	Product development models
GELD	Business model Kosten Betaalbaarheid voor beoogde gebruikers	Business model canvas
RISICO'S	Hoe om te gaan met risico's Actieplan	



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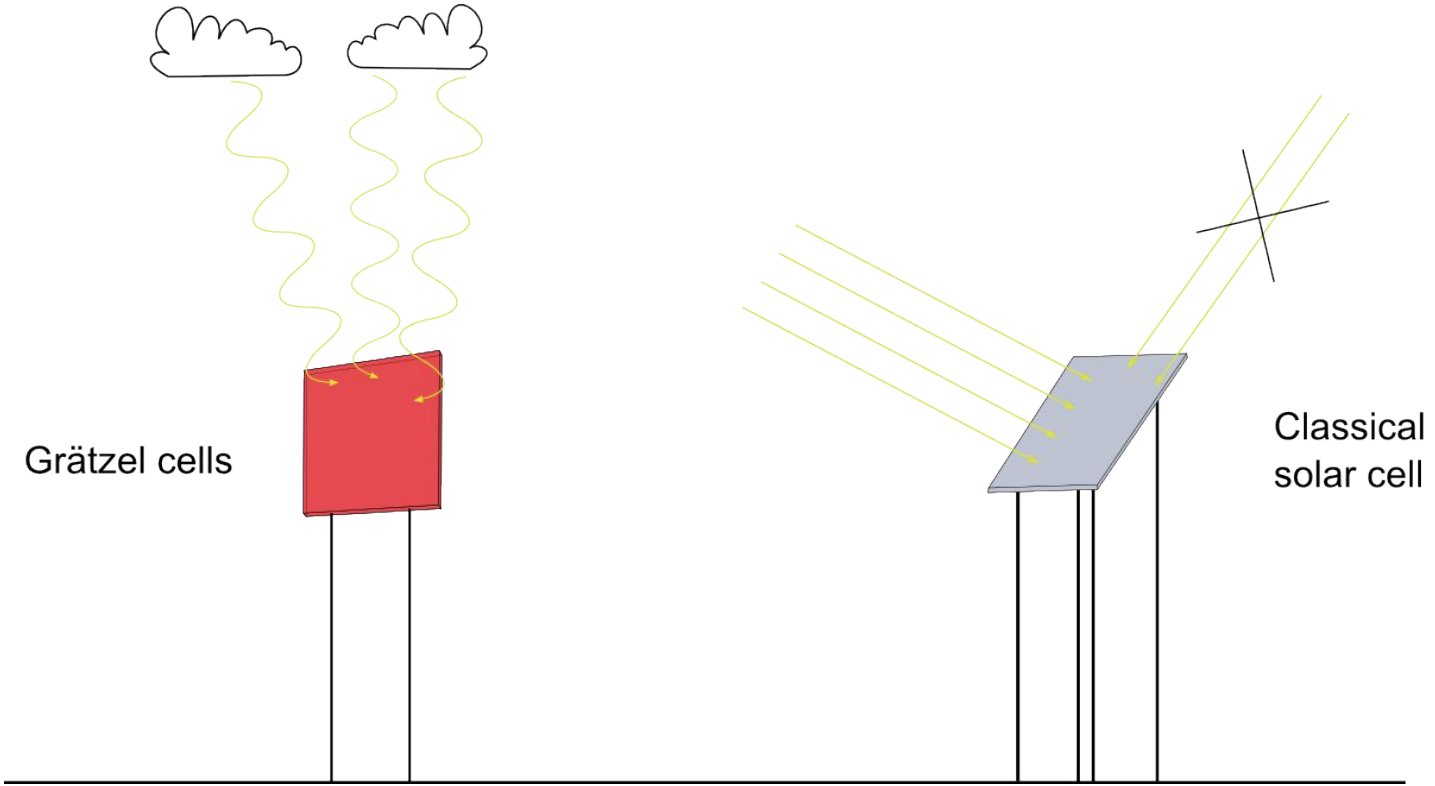

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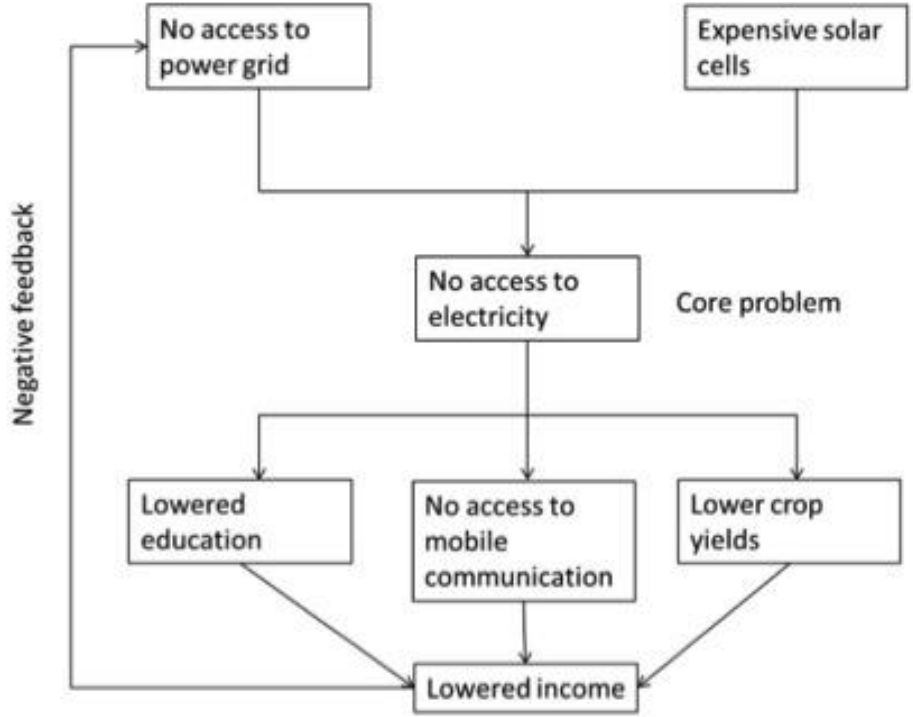

Figure 1: Graphic representation of the problem

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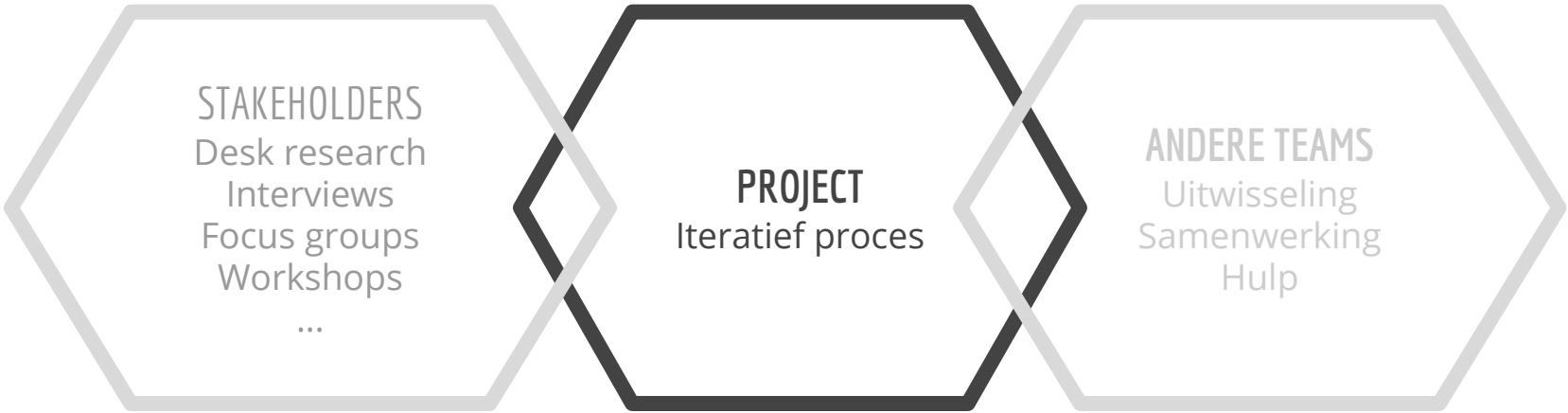

STAKEHOLDERS
Desk research
Interviews
Focus groups
Workshops
...
PROJECT
Iteratief proces
ANDERE TEAMS
Uitwisseling
Samenwerking
Hulp

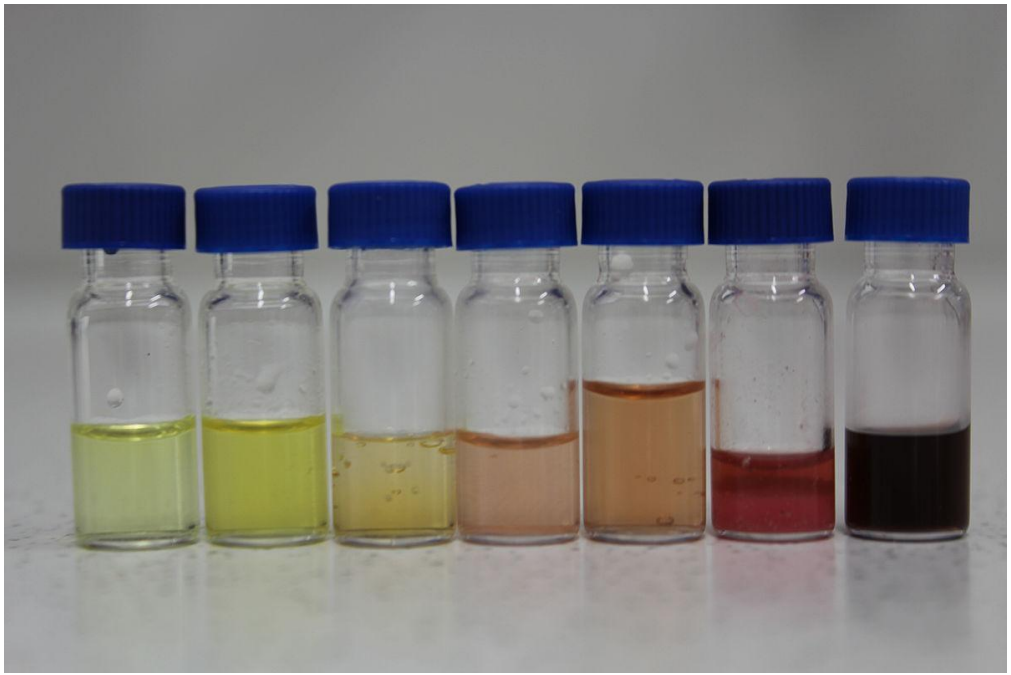


PHOTO by iGEM TU_DARMSTADT 2014

TECHNO-MORELE VIGNETTEN

PHOTO by DUSTIN LEE

APPLICATIES IN MAATSCHAPPELIJKE CONTEXT

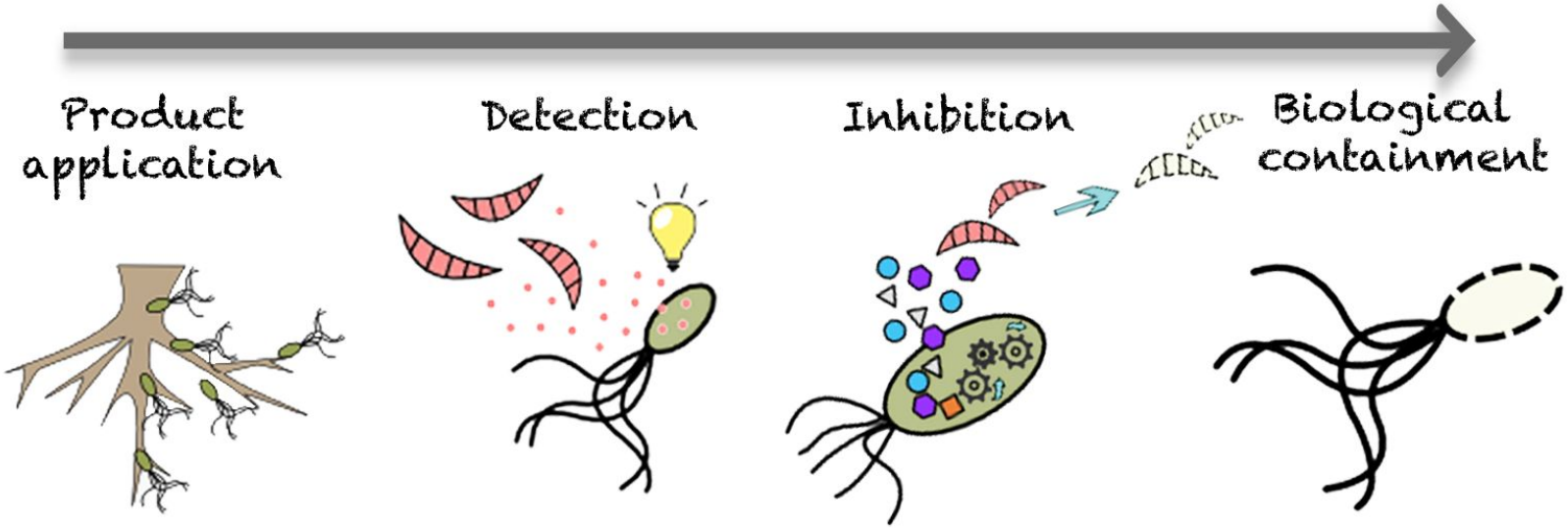
- Van *hard impacts* naar *soft impacts* (SWIERSTRA & TE MOLDER 2012)
  - Project specifiek project
  - Oefeningen met team: bijv. soft impacts smartphone, soft impacts prenatale diagnostiek

- Ethiek
  - Mogelijke reacties van verschillende stakeholders op hun innovatie en wat voor soort ethische argumenten zij daarbij wellicht zouden gebruiken.
  - Principes en consequenties
  - (SWIERSTRA & RIP 2007) - Nano-ethics as NEST-ethics: Patterns of Moral Argumentation About New and Emerging Science and Technology

- Wat betekent wat voor welke stakeholder en waarom?
  - Verplaatsing in persoon/land

OA uit SMIT EN VAN OOST 2009

The electricity wasn't the only new thing in the village. People from Dakar came and gave credits to women who lent money together in a group of five or six persons. Amadou's wife, Amina, used the money to buy a small sewing machine and open a small tailor shop with two other women. At first he disagreed, because this meant she could work less on the field. But even Amadou had finally to admit that you couldn't live from air and hard work alone, so he agreed. Indeed, Amina's income helped to feed the family. They even could afford a small lamp for their own house and their smallest daughter loved to read a book the local school teacher gave to her. Amadou didn't care about books neither could he read. His parents couldn't read either nor did they think of it to be useful on the field. Still, he grew up to be a good man who dedicated his work on the field to god.



GRAPH by iGEM WAGENINGEN 2014

This is in a future from when BananaGuard has become such a success that the company started producing other products that can also protect other crops such as tomatoes or cucumbers, but is not the only choice for these plants.

Looking through her choices she wasn't sure what to choose. She wanted something that worked well so she was thinking of adding nutrients and using either chemicals or TomatoGuard. She was going to choose the chemicals but, she wanted to grow organic tomatoes and adding those chemicals would ruin them using GMO bacteria, however, just does not feel well either because it is a GMO and there had been a lot of protest against their introduction recently.

MORELE REFLECTIE?

PHOTO by YU-CHUAN HSU

iGEM: POLICY & PRACTICES

"Eindelijk iets dat wel betekenis heeft"

Interventie product design

INTERNE DIALOOG

Binnen het team

Focus en diversiteit

Coherent verhaal = prijs winnend

EXTERNE DIALOOG

Het betrekken van visies van stakeholders en daar werkelijk iets mee doen in het project

HANDLEIDINGEN

Begeleiding noodzakelijk

Stapsgewijs!

TOEGEVOEGDE WAARDE SCHRIJFPROCES

Verbeelding noodzakelijk

Nieuwe inzichten

Input = verandering

BIJDRAGE AAN RRI

1e en 2e orde leermomenten

Tools

- RRI dimensies: checkboxing vs. verandering
- Eerste, tweede en derde orde leren
- Wat gebeurde er onvoldoende of niet?
- Scenarioproject iGEM 2015

- Praktisch & stapsgewijs
- Gekoppeld aan bestaande opdrachten en projecten (later: eigen onderzoekspraktijk)
  - iGEM: alternatieve designpaden + betekenisvollere invulling policy & practices
- Het schrijven / in beeld brengen is essentieel
- Een gevoel van succes en betrokkenheid

DANK VOOR UW AANDACHT

PHOTO by LINH NGUYEN