1st North-South Conference on degrowth
2018.9.4 @Mexico City

Suitable bioenergy options in the So uth; traditional vs high-tech: A case study in Nigeria

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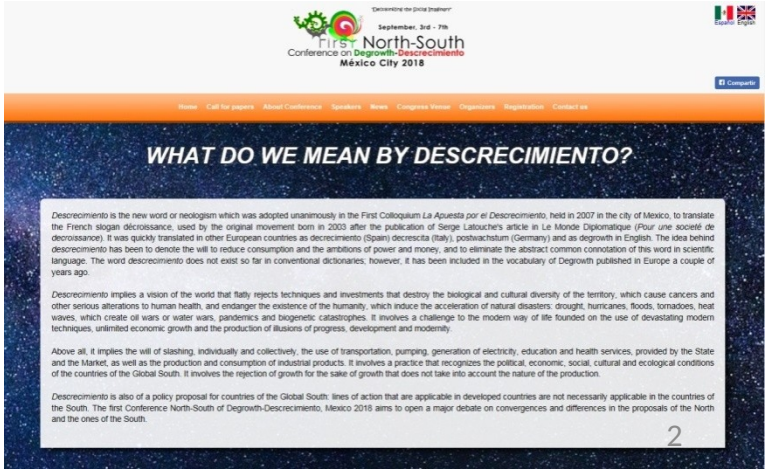
Backgrounds

- Main focuses of this conference
  - Descrecimiento is also of a policy proposal for countries of the Global South: lines of action that are applicable in developed countries are not necessarily applicable in the countries of the South.
  - The first Conference North-South of Degrowth-Descrecimiento, Mexico 2018 aims to open a major debate on convergences and differences in the proposals of the North and the ones of the South.



Backgrounds

- To start discussions on these issues, we should identify;
  - Actions which are applicable in developed countries but are not applicable in the countries of the South
  - Differences that are in the proposals of the North and the South

The objective of this study

- This study investigates technology options the local st akeholders in the Southern countries require to ensu re sustainable society
- We use bioenergy technologies in Nigeria as a case st udy

Methods

- A traditional low-tech option (improved cook stove) was compared with much modern and high-tech options (bio-ethanol, biogas, and co mbined heat and power)

Low-tech

vs

High-tech

Methods

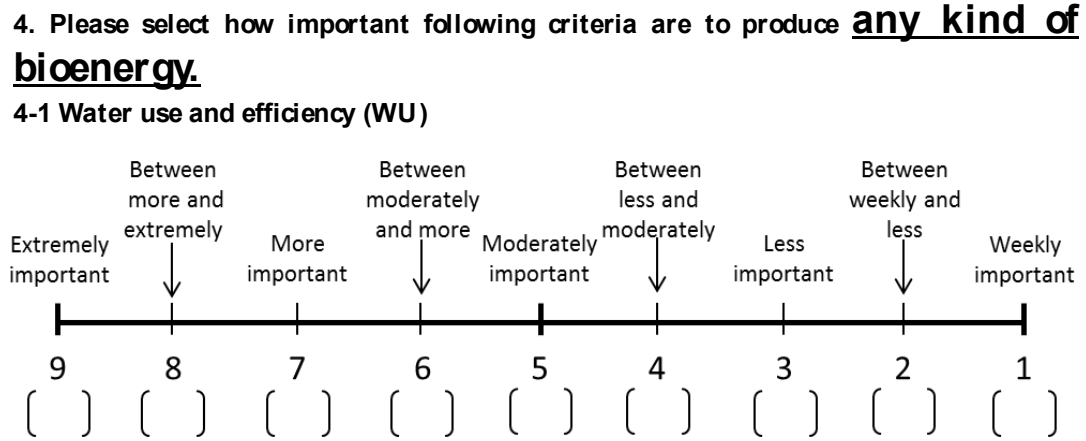
- Four types of conversion technology which are popular or anticipated in Nig eria
  - Bioethanol
  - Biogas
  - Improved cook stove
  - CHP
- Six criteria which seem to be important for Nigerian bioenergy are selected b y local consultants
  - Water use and efficiency
  - Land use and the change
  - Price and supply of food
  - Jobs
  - Productivity
  - Infrastructure and logistics
- These criteria are selected from Global Bioenergy Partnership (GBEP) sustain ability indicators for bioenergy

Methods

- Multiple criteria decision analysis (MCDA) was applied
  - to obtain stakeholders' comprehensive valuations which consider various aspects of sustainability
  - MCDA is frequently applied to bioenergy and envir onmental issues that has various stakeholders

Methods

- Respondents were asked the following two questions:
  - how much, for instance, bioethanol significantly contributes to water use efficiency
  - how important each criteria is for the production of bioenergy



Methods

- A questionnaire survey for various stakeholders in Nigeria was conducted in 2017
  - National/local policymakers
  - Feedstock producers
  - Researchers
  - Farmers

  etc.
- In total, 244 questionnaires were collected from the stakeholders
- From the data, we estimate relative weights of each bioenergy options
  - The importance of each bioenergy technology from the view point of sustainability

Methods

- Relative weights are estimated by the following matrix considering both the contribution of each technology to sustainability and importance of t he criteria

- Comparison between W_{ICS} and average of W_{BET}, W_{BGS} and W_{CHP}

Results 1

- The stakeholders showed preference to low-tech bioenergies over the high-tech one
  - Significant difference at the 1% level

VS

	Low-tech	High-tech
Weights	0.445	0.411

- There were no significant differences in the gender preferences of each option

Results 1

- The results mainly come from very low weight for bioethanol
  - Improved cook stove 0.456
  - Bioethanol 0.268
  - Biogas 0.476
  - CHP 0.490

Excluded

- So we exclude bioethanol, and compared low-tech (W_{ICS}) with biogas and CHP (average of W_{BGS} and W_{CHP})

Results 2

- The stakeholders showed preference to high-tech bioenergies over the low-tech one (opposite results!)
  - Significant difference at the 1% level

vs

	Low-tech (ICS)	High-tech (BGS, CHP)
Weights	0.445	0.483

- There were no significant differences in the gender preferences of each option again

Results 3

- Who values high-tech higher?
  - Comparison with policymakers (local and national) and production sites (cassava processors, farmers, ethanol producers, and feedstock processors)
  - Production sites values high-tech (bioethanol, biog as, and CHP) higher than policymakers
    - For the average of thee options (bioethanol, biogas, an d CHP)
      - Significant difference at the 10% level
    - For the average of two potions (biogas and CHP)
      - Significant difference at the 5% level

Considerations and conclusions

- No gaps between the North and the South
  - The North tends to introduce new (high) technologies to the South
  - The South wants high-tech bioenergy
  - No gaps were found
- A gap between policymakers and production sites in the South
  - Production sites prefer high-tech to low-tech
  - There is a gap within the South

Considerations and conclusions

- Technology transfer is necessary for degrowth
  - Because technology is an important factor not to d epend on economic growth
- Policy support to promote technology dissemi nation to the South is also important
- But we have to be aware of the gap between
  - Policymakers and production sites in the South

Thank you very much for your attention!

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