Ministry of Infrastructure and the Environment

GBEP
Global Bioenergy Partnership

Piloting the GBEP Sustainability Indicators

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ECOWAS, Regional Bio Energy forum,
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Summary

- The development of GBEP indicators
- Piloting of the indicators
- Selection of the indicators
- Experiencies of testing the indicators in the Netherlands
- First outcomes and conclusions

- Mr Hamza Tanko on the experiences in Ghana

The development of GBEP indicators

- GBEP Task Force on Sustainability was established in June 2008
- Agreement on the 24 sustainability indicators in May 2011
- Endorsement of full GBEP sustainability indicators report with templates in November 2011

Goal of the GBEP sustainability indicators:

- To guide analysis undertaken of bioenergy at the domestic level
- Informing decision making and facilitating the sustainable development of bioenergy

- Now piloting the sustainability indicators
- Activity group under the Working Group on Capacity Building to raise awareness, share data and experiences on implementation of indicators

Environmental	Social	Economic
1. Life-cycle GHG emissions	9. Allocation and tenure of land for new bioenergy production	17. Productivity
2. Soil quality	10. Price and supply of a national food basket	18. Net energy balance
3. Harvest levels of wood resources	11. Change in income	19. Gross value added
4. Emissions of non-GHG air pollutants, including air toxics	12. Jobs in the bioenergy sector	20. Change in consumption of fossil fuels and traditional use of biomass
5. Water use and efficiency	13. Change in unpaid time spent by women and children collecting biomass	21. Training and re-qualification of the workforce
6. Water quality	14. Bioenergy used to expand access to modern energy services	22. Energy diversity
7. Biological diversity in the landscape	15. Change in mortality and burden of disease attributable to indoor smoke	23. Infrastructure and logistics for distribution of bioenergy
8. Land use and land-use change related to bioenergy feedstock production	16. Incidence of occupational injury, illness and fatalities	24. Capacity and flexibility of use of bioenergy

Piloting of the indicators

Why?

- Testing in the field: from theory to practice
- Learn about data collection, gaps and find possible solutions
- Learn about the proposed methodologies
- In future further improvements of the indicators

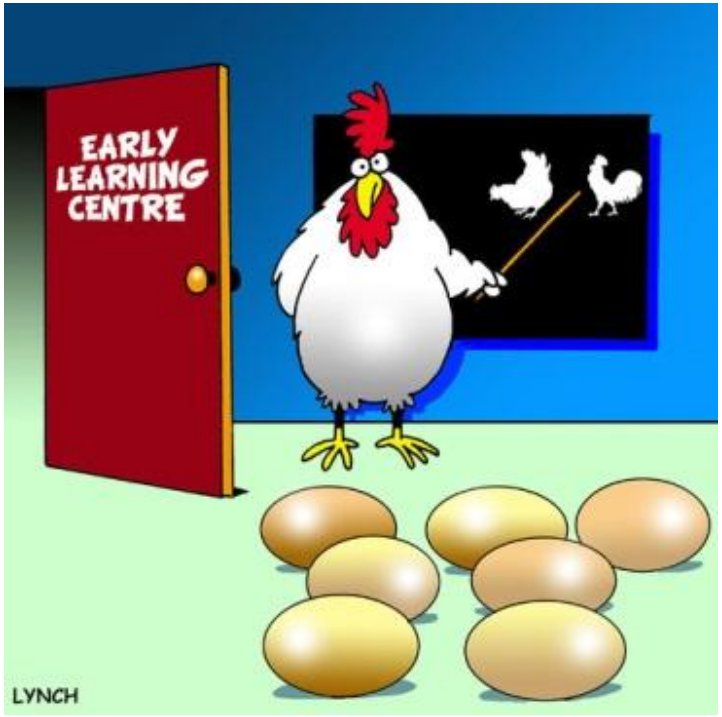
Where?

- Japan (plant), Germany, Ghana and ECOWAS, The Netherlands, US, Colombia, Indonesia
- Madagascar. And others?

- **The more, the better to gain experience, learn and improve**

Piloting of the indicators

The more, the better to gain experience, learn and improve



The 2 Pilots of the indicators

2 pilots: in the Netherlands and in Ghana/ECOWAS financed through NLAgency, 2 consultants

Goals in the Netherlands

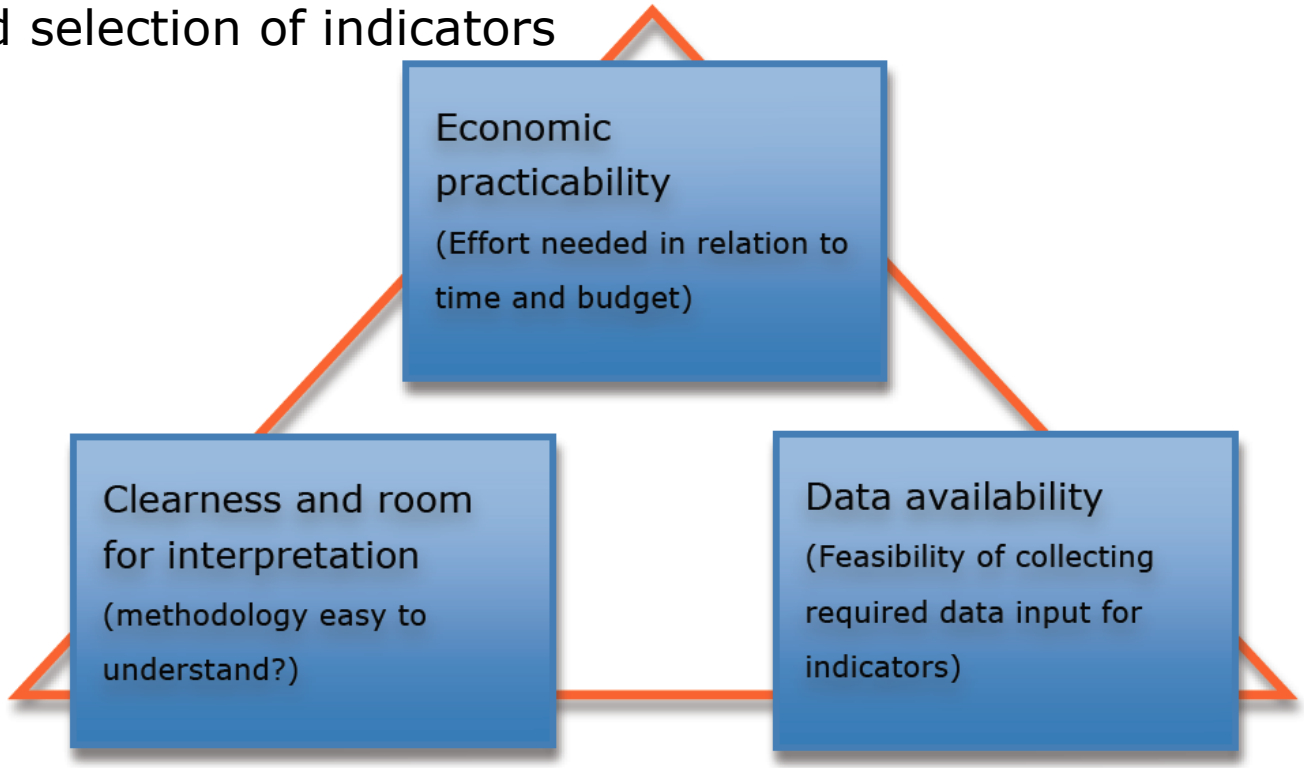
- Testing in the field
- Lessons to be learned on data (gaps), methodologies
- Suggestions for improvements
- November 2011 – April 2012

Goals in Ghana

- Assess sustainability of the Ghanaian bio energy sector
- Develop sustainable bio energy policies
- Learn lessons to enhance practicality for policymakers and spread experiences in ECOWAS region and GBEP
- November 2011 – August 2012

Approach taken: Focus on 3 pillars

- A balanced selection of indicators from 3 pillars
- Indicators should be useful in the national context
- Budget required selection of indicators



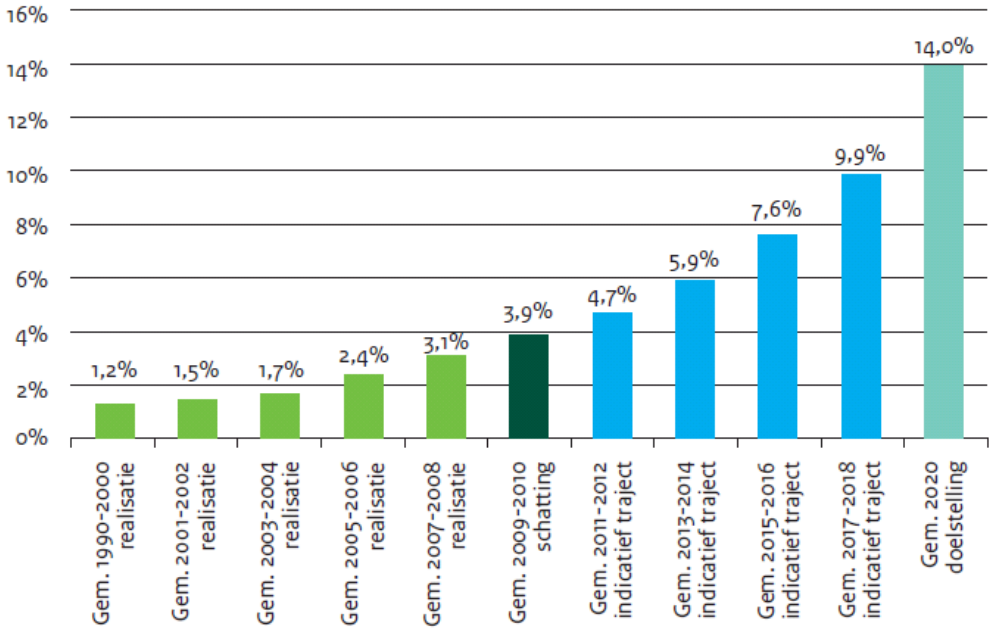
Comparison selection of indicators NL and GH

Environment	Social	Economic
1. Life Cycle GHG Emissions (NL GH3)	9. Allocation and tenure of land (GH2)	17. Productivity (NL, GH1)
2. Soil Quality (NL, GH4)	10. Price and supply of national food basket (GH1)	18. Net energy balance (NL, GH4)
3. Harvest levels of wood resources (NL, GH1)	11. Change in income (NL)	19. Gross value added (NL)
4. Emissions of non GHG air pollutants (NL, GH5)	12. Jobs in the bioenergy sector (NL, GH4)	20. Change in consumption of fossil fuels (NL, GH2)
5. Water use and efficiency (NL)	13. Change in unpaid time women and children	21. Training and requalification of workforce (GH6)
6. Water quality (NL)	14. Expand access to bio energy services (GH3)	22. Energy diversity (NL, GH5)
7. Biological diversity in the landscape (NL)	15. Change in mortality and disease indoor smoke	23. Infrastructure and logistics (NL, GH3)
8. Land use and Land use change (NL, GH2)	16. Incidence of injury, illness (NL)	24. Capacity and flexibility of use of bioenergy (NL)

Characteristics of the Netherlands

Year 2009/2010

- 68 PJ Renewable Energy
- 3,9% RE of total energy
- 75% RE is biomass



- Growing to 14% RE in 2020

Characteristics of the Netherlands

- Netherlands is a trading country – characterized by large import and export flows of biomass resources

- Bioenergy sector is developing – though still in its infancy (not a separate sector)

- Large availability of data resources and reports – not always comparable and sometimes contradictive (CBS, Universities, NLAgency, Neth. Env. Assessment Agency (PBL)

Approach Taken: Development Excel Template

NOTE: Do not make changes in this sheet
Numbers are automatically filled in from the other individual indicator sheets.

GO TO: Social indicators

ENVIRONMENTAL INDICATORS

Indicator	Topic	Outcome		Specification	Uncertainty data	Robustness outcome
Indicator 1:	**Lifecycle GHG emissions**	0	g of CO2 eq / MJ			
Indicator 2:	**Soil carbon**	0	%			
Indicator 3:	**Harvest levels of wood resources**					
		1200000	m3	Annual harvest of wood resources		
		0.54545455	%	Annual harvest of wood resources		
		0.0002975	%	Percentage of annual harvest used for bioenergy		
Indicator 4:	**Emissions of non-GHG air pollutants, including air toxics**					
	PM2.5	0	[fill in unit]	Bioenergy feedstock production		
		0	[fill in unit]	Processing		
		0	mg / MJ	Transport		
		0	mg / MJ	Use		
	PM10	0	[fill in unit]	Bioenergy feedstock production		
		0	[fill in unit]	Processing		
		0	mg / MJ	Transport		
		0	mg / MJ	Use		
	Nox	0	[fill in unit]	Bioenergy feedstock production		
		0	[fill in unit]	Processing		
		0	mg / MJ	Transport		
		0	mg / MJ	Use		
	SO2	0	[fill in unit]	Bioenergy feedstock production		
		0	[fill in unit]	Processing		
		0	mg / MJ	Transport		
		0	mg / MJ	Use		
Indicator 5:	**Water use and efficiency**					
TARWR and TAWW	total	0	%	of TARWR		
		0	%	of TAWW		
	renewable sources	0	%	of TARWR		
		0	%	of TAWW		
	Non renewable	0	%	of TARWR		
		0	%	of TAWW		
Water withdrawn	total	0	[fill in unit]			
	renewable water resources	0	[fill in unit]			
	non-renewable water resources	0	[fill in unit]			
Indicator 6:	**Water quality**					
	Loadings to bioenergy production	0	in kg/ha/yr	of N		
		0	in kg/ha/yr	of P		
		0	in kg/ha/yr	of AI		
		0	in %	of total N from agriculture in watershed		

One fixed main sheet that collects all outcomes of indicators

Example: Harvest levels wood

Indicator 3: Harvest levels of wood resources

explanation: Annual harvest of wood resources by volume and as a percentage of net growth or sustained yield and the percentage of the annual harvest used for bioenergy
The indicator applies to bioenergy production from wood resources and forestry residues, according to nationally defined forest type.

Annual harvest of wood resources
Indicator 1: 1200000 m3 — *m3/ha/year, tonnes/ha/year, m3/year or tonnes/year, indicate unit*
54.5% %
Percentage of annual harvest used for bioenergy
Indicator 2: 0.03% %

Methodological approach and calculations

Indicator 3.1 Information is used from Probos (2010)
Annual harvest resources are: 1200000 m3
Net growth percentage 54.5% %

Relevant definitions (when used for methodology):

Net growth is based on dividing the yearly auction by the current increment of wood.

When referring to % of harvest used for bioenergy, we refer here to all bioenergy (including export, excluding import)

Limitations in calculations

Level of uncertainty

Indicator 3.1 Medium - Indicator is based on data from 2005 (although publication is from 2010)

Indicator 3.2 Amount of forest resources used for bioenergy are largely contradtive - from the processing side, amounts are considerable lower than when looking at the Probos report.
We have used the Probos report as reference for this indicator

Data sources used

Indicator 3.1 Probos (organization) publishes yearly an update of the core data of wood resources in the Netherlands; Probos (201)
Source: Probos, Kerngegevens Bos en Hout in Nederland

Growing stock >
Increment and auction in m3 ("spilhout met schors")

	m3	m3/ha
Growing stock (including dead wood)	616660000	194
Current increment	2200000	8
Auction	1200000	

Fixed format for data collection, methodology and final outcome per individual indicator

First results: Net job creation

Net job creation as a result of bioenergy production and use, total (12.1) and disaggregated (if possible) as follows: 2) skilled / unskilled, 3) indefinite / temporary

4) Total number of jobs in the bioenergy sector; and % adhering to nationally recognized labour standards consistent with the principles enumerated in the ILO Declaration on Fundamental Principles and Rights at Work
5) this in relation to comparable sectors

Total number of jobs

11920	number	total
0,19	%	in relation to total working population
100	%	compliance of ILO
100	%	compared with any other sector

Indicate to which sector compared: All sectors in the NL

First recommendations in NL

- Harmonize data collection and reporting requirements between organizations and time-wise (e.g. Progress report to EC every 2 years, NEA on biofuels yearly, CBS yearly or longer depending on information)
- Good baseline inventory on biomass and bioenergy use is key for monitoring GBEP indicators (which year as a starting point, 2007)
- Recommended to extend monitoring efforts to the biobased economy in general;
- Harmonize efforts on data collection for default values (e.g. on water use processing facilities in Europe);

GBEP pilot project
Sustainability Indicators in Ghana

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ECOWAS, Regional Bio Energy Forum, 21 March 2012

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2. Status of activities
3. Assignments Research Institutes
4. Questions

1 Introduction

- Funded by: NLAgency
- Ghana + ECOWAS partners:
  - Ghana Renewable Energy Agency
  - Council for Scientific and Industrial Research
  - Ghana Energy Commission
  - ECREEE
- Assisted by: Partners for Innovation (Netherlands)

1 Goals

1. How to use GBEP Sustainability Indicators as a tool to:

- Assess sustainability of the Ghanaian bio-energy sector
- Develop sustainable bioenergy policies

2. Learning lessons on using the indicators:

- Enhance their practicality for policymakers
- Spread experiences within ECOWAS / GBEP

1 Stakeholder group

- Dr. A.B. Salifu, Director-General, CSIR
- Dr. Hakeem Wemah, Northern Development Forum
- Dr. Agyekum Hene, Africa Biofuel Renewable Energy Company
- Mr. Salifu Abdul-Razak Ziblim, Min. Food and Agri. (MoFA) - DCS
- Dr. Komla B. Kotatsi, Min. of Environment, Sci. and Tech. (MEST)
- Mrs. Florence Agyei, Environmental Protection Agency (EPA)
- Prof. Abeeku Brew-Hammond, Energy Centre, KNUST, Kumasi
- Mr. Julius Nkansah-Nyarko/Mr. Kwabena A. Otu-Danquah, EC
- Dr. Beatrice Mensah, CSIR-Institute of Industrial Research
- Representative , Ministry of Lands and Natural Resources
- Forestry Commission

2 Status of activities

Nov-Dec 2011	Jan-June 2012	May-July 2012	Aug 2012
• **Stakeholder identification** • **Policy inventory** • **Selection of indicators** • **Pre-selection of Research Institutes**	• **Terms of Reference Research Institutes** • Contracting Research Institutes •Assessment of data availability, usefulness and quality •Meeting stakeholder group for review results	• Workshops with policy makers aimed at sustainable bioenergy development	• Report & presentation of results at GBEP and ECOWAS

2 Selection of indicators

Environmental		Social		Economic	
1. Life-cycle GHG emissions	3	9. Allocation and tenure of land for new bioenergy production	2	17. Productivity	1
2. Soil quality	4	10. Price and supply of a national food basket	1	18. Net energy balance	4
3. Harvest levels of wood resources	1	11. Change in income		19. Gross value added	
4. Emissions of non-GHG air pollutants, including air toxics	5	12. Jobs in the bioenergy sector	4	20. Change in consumption of fossil fuels and traditional use of biomass	2
5. Water use and efficiency		13. Change in unpaid time spent by women and children collecting biomass		21. Training and re-qualification of the workforce	6
6. Water quality		14. Bioenergy used to expand access to modern energy services	3	22. Energy diversity	5
7. Biological diversity in the landscape		15. Change in mortality and burden of disease attributable to indoor smoke		23. Infrastructure and logistics for distribution of bioenergy	3
8. Land use and land-use change related to bioenergy feedstock production	2	16. Incidence of occupational injury, illness and fatalities		24. Capacity and flexibility of use of bioenergy	

2 Research Institutes

- CSIR Institutes, specifically:
  - Forestry Research Institute
  - Institute for Industrial Research
  - Crops Research Institute
- KNUST / Energy Center
- University of Ghana / ISSER

3 Assignments

- Select 3 Research Institutes to do the work for the 3 pillars
- Each Research Institute does the work for 3-4 indicators (for 1 pillar)

- GBEP Indicator report is starting point for the work to be carried out
- Uniform reporting in a prescribed Excel template

3 Goals assignments

1. Collect most appropriate (available) data

2. Assess usefulness, availability and quality

3. Provide recommendations for improved data collection and use

3 Example reporting

Indicator 2: Soil carbon

Percentage of land for which soil quality, in particular in terms of soil organic carbon, is maintained or improved out of total land on which bioenergy feedstock is cultivated or harvested. The indicator applies to bioenergy production from all bioenergy feedstocks.

GO TO 'Sources'

			Valid for year	Sources used
Indicator 2.1:		%		
Indicator 2.2:	Maintained / improved land	ha		
Indicator 2.3:	Total land	ha		


THANK YOU
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