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“Social aspects must play a greater role in sustainability criteria”

“Although we have not reached all our goals yet, we now have to focus on social sustainability criteria to avoid excesses such as land grabbing”, says Dorette Corbey, president of the Dutch Commission on Biomass Sustainability

Green Matter Magazine 2014 is a one-off publication by Netherlands Enterprise Agency (previously known as NL Agency).

The Netherlands Programmes for Sustainable Biomass (NPSB) bundle and disseminate knowledge from the biomass project portfolio of Netherlands Enterprise Agency and complete knowledge gaps with supplementary research. The NPSB project portfolio consists of the Global Sustainable Biomass Fund, the Sustainable Biomass Import Fund and relevant projects from the Daey Ouwens Fund. These programmes are funded by the Dutch ministry of Economic Affairs and the Dutch ministry of Foreign Affairs.

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20 Bagasse briquette fuel for trapiches

At first, smallholders were confronted with heavy handling, dirty smoke, high temperatures and high humidity in their daily energy supply routine. Now those working conditions are largely over.



29 Soapbox Orator: Pjotr Schade

Pellets of residual wood produced in a highly sustainable manner turn out to be in demand from energy companies for energy production, as demonstrated by the Inbio project.





35 “Sustainability standards should be region-specific”

Palm oil is one of Indonesia’s economic cornerstones and provides jobs for millions of Indonesians. But palm oil has disadvantages, deforestation being one of the most important. “But we are working very hard on that,” says Dadan Kusdiana, head of the Bioenergy Program Division within the Indonesian Ministry of Energy and Mineral Resources.



37 Biomass certification authentication tool

46 Bamboo

In a project in Colombia, bamboo has been optimised as an energy source by using torrefaction.



More...

All projects mentioned in this Green Matter Magazine are commissioned and funded by Netherlands Enterprise Agency



Biomass in the polders

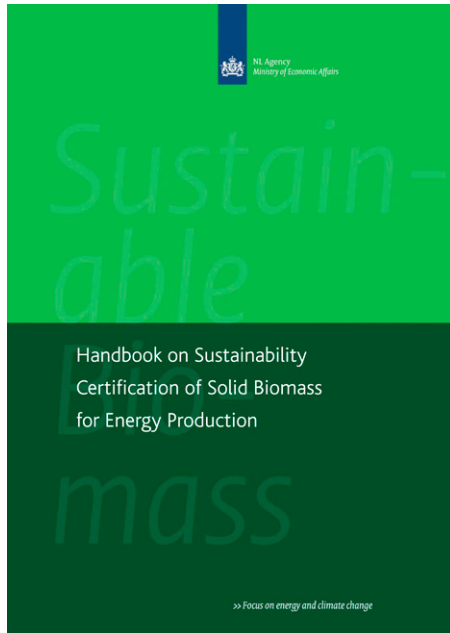
The Netherlands is made up of polders. And the polders need ditches, otherwise we would very soon be flooded. And every autumn these are dredged because reed growth is rampant and needs to be removed. Each year, this yields surprising amounts of biomass along the edge of the ditch. And you don't need to do anything to create it. Yes, there are costs associated with extracting and processing it. But that's all. When I ride past on my bicycle I think how great it would be if the Netherlands had enough ditches and reed to generate our energy supply, or make the economy bio-based. But that is just a dream. And so biomass simply has to be produced. Furthermore, biomass is not sustainable per se. However well it fits with a circular economy, or sustainable energy supply, biomass production can also have negative consequences for the environment. Every aspect of the chain, from production through to consumption, plays a part in this as this Green Matter Magazine demonstrates. It is also why the Dutch government and the Netherlands Enterprise Agency (previously known as NL Agency) have been involved for many years in making the biomass chain more sustainable.

This is why we develop criteria, facilitate projects, and implement our own programmes to determine whether these criteria work in practice.

Examples include the Sustainable Biomass Import programme for closely examining the import-related aspects of biomass chains into the Netherlands and the Sustainable Biomass Global programme, which focuses on developing countries.

These programmes have been put in place by the Dutch Ministries of Economic Affairs and Foreign Affairs in 2009, because the Netherlands cannot and does not want to be self-sufficient in terms of biomass. And they exist because without a significant proportion of biomass, a sustainable economy would be impossible.

Rob Boerée
Director National Programmes
Netherlands Enterprise Agency
(previously known as NL Agency)



New handbook for solid biomass sustainability certification

Sustainability certification is developing at a rapid pace and market players are working on certification for their biomass feedstock. Certification schemes are being developed, often with the involvement of multiple stakeholders. Moreover both European and national governments are considering proposals for sustainability requirements related to solid biomass used for energy production. The objective of this handbook, compiled by Netherlands Enterprise Agency, is to assist market players and other stakeholders in gathering information and informed deci-

sion-making on sustainability certification for solid biomass and related issues. Market players in international or national chains of solid biomass production, processing and use (bioenergy producers) can use this handbook, as well as other stakeholders involved in sustainability certification for solid biomass, e.g. policy makers, non-governmental organisations (NGOs), consultants and researchers.

+ www.rvo.nl/biomass/handbook-biomass



The handbook presents key features of 9 selected solid biomass certification schemes.

Netherlands takes the lead in certified vegetable oil

The import of palm oil into The Netherlands has shown a strong increase over the last year. The Netherlands is also a forerunner in the import of certified vegetable oils. These and other observations can be read in the 2013 edition of the annual report Sustainable Biomass and bioenergy in The Netherlands. The report provides an in-depth overview of the current state of affairs in Dutch biomass trading. With so much going on in the biomass arena, it is important to take stock every now and again.

The Netherlands Enterprise Agency commissioned Utrecht University's Copernicus Institute to perform the analyses for this year's annual report on Dutch biomass trade. For a quick overview the Netherlands Enterprise Agency compiled a fact sheet based on the 2013 report.

+ www.rvo.nl/biomass/monitoring



Pellets for Power

A growing demand for sustainable biomass in the Netherlands and a vast amount of underutilised biomass in Ukraine were a match for this project. Although actual imports were not economically viable, the project yielded valuable knowledge on biomass certification and local sustainable production. Project partners Phytofuel, Tuzetka and Wageningen UR initially focused on switchgrass, but quickly turned their attention to straw and reed too.

> Read more on page 16



Guidance for producing sustainable charcoal

At least 80% of the African population depend on traditional biomass resources such as charcoal and firewood for household energy use. Most of the charcoal is produced unsustainably in forests near urban areas, where the vast majority is consumed. To support the decision of whether and how to engage in producing alternative charcoal, the Biomass Technology Group (BTG), on behalf of Netherlands Enterprise Agency, has now developed the Alternative Charcoal Tool (ACT). Being an interactive Excel tool, the ACT is a quick guide for assessing business case opportunities and supports the

design and implementation of programmes and projects. It consists of four modules, namely feedstock selection, market selection, technology selection, and production costs determination. The tool can be used by small and medium enterprises, policy makers as well as NGOs or donor organisations in developing countries.

+ www.rvo.nl/biomass/crops

80% of the African population depends on traditional biomass resources such as charcoal and firewood for household energy use.

80%

'Hands on' tool to convince financial investors

How to source funding for biomass projects? How do you increase a project's chances of commercial success both during and after the subsidy period? How do you convince investors and banks? Netherlands Enterprise Agency commissioned the consultancy Everest Energy to create a support structure and tools to provide projects within the Netherlands Enterprise Agency portfolio with 'hands on' capabilities for their analysis. The assignment's objective was to analyse the project, calculate its Discounted Cash Flow

(DCF) statement, and thus arrive at a bankable presentation. This has been achieved for 24 projects which joined forces to shape a portfolio of projects in order to interest potential investors. The tools developed support projects in their detailed opportunity assessment, risk, partner choices and future value and strategy and are now available online in a report.

+ www.rvo.nl/biomass/finance



Capturing methane in Indonesia

Zebra Special Products Inc. introduced a new methane capture and usage system in Palembang, Indonesia. "This system helps to reduce greenhouse gas emissions. Although the project did not yet receive CO₂ credits, the project may be economically viable in the future if it can concentrate, clean and compress the combustible gas for cooking purposes."

> Read more on page 21



Consideration for indigenous rights

A project launched by the Netherlands Centre for Indigenous Peoples (NCIV), resulted in the Palangka Raya Declaration, in which indigenous people's organisations in Indonesia urge the European Commission to focus more on social criteria in its renewable energy policies. The main guarantee that indigenous peoples request be implemented is their right to free, prior and informed consent: FPIC for short.

> Read more on page 34

Governance in biomass projects: no one-size-fits-all

Governance in biomass projects is important, especially because of their pioneering and innovative nature. Moreover, every project in the biomass industry is unique, so no universal solution for governance can be applied. Biomass projects are pioneering and innovative undertakings that can have a great impact on their surroundings. They have social ramifications, environmental constraints, and economic consequences. It is therefore important to have a good governance framework in place, with the tools, checks and balances that ensure no harm is done, that all results from the project offer everyone maximum benefits. Netherlands Enterprise Agency has issued a factsheet that outlines the most important ingredients for good governance in the planning, operational and termination phase of almost any biomass-related project. The factsheet is aimed at biomass project developers.

+ www.rvo.nl/biomass/policies

Bio2Watt

In certain cases, projects may only start after executing a Social and Environmental Impact Assessment (SEIA). One example is the Bio2Watt project in South-Africa, which aims to implement anaerobic digestion facilities for converting organic residues into biogas and fertilisers.

Biomass production may not negatively affect soil quality

Alterra (Wageningen UR, Food & Biobased Research), commissioned by Netherlands Enterprise Agency, has developed a tool that offers the first opportunity for assessing sustainability criterion requiring that biomass production may not negatively affect soil quality. The tool allows producers and other stakeholders to input data about biomass crops, climatic conditions, soil characteristics etc. The tool then indicates the consequences of bioenergy production for multiple soil quality parameters, such as organic matter composition and acidity. It also advises on how to recover

nutrients from bioenergy crops to maintain soil fertility. The tool aims to be user-friendly and relevant to large-scale bioenergy users and producers as well as small-scale bioenergy users.

+ www.bioEsoil.org





Low Indirect Impact Biofuels (LIIB)

A team of researchers, biofuel practitioners and NGOs has now succeeded in compiling a practical, widely applicable methodology for ensuring the cultivation and production of Low Indirect Impact Biofuels (LIIB). László Máthé, of WWF International: “If a company approaches us and says ‘We want to do the right thing and produce biofuels without the risk of indirect land use change’, we can now tell them how to go about it. Conversely, if public authorities want to know whether a certain company is ‘doing the right thing’, they now have the means to assess it.”

> Read more on page 45

Bamboo fits in a bio-based economy

Bamboos are a large group of rapidly growing crops, which can be sustainably managed in many parts of the world. Bamboo stands can be managed by individual producers and its production does not require large investments. This makes bamboo an ideal crop for rural development in developing countries. Bamboo is extremely versatile and is used for various applications. Large-scale production dedicated to bioenergy is difficult and potentially undesirable because of the need for manual harvesting and the

higher market value of non-energy uses. The residuals of bamboo processing however may be useful as a bioenergy feedstock. The report assesses possible applications of bamboo in a biobased economy, and sums up its potential in a SWOT analysis. Further research and development is required in order to achieve the full potential of bamboo as a commodity for the biobased economy.

+ www.rvo.nl/biomass/crops



Wheat straw is viewed as one of the primary feedstocks for the biobased economy given the volume of straw produced every year.



Straw is the motor for a biobased economy

Rice straw and wheat straw are the most abundant agricultural residues in the world (next to residues from maize production, and sugar cane). The use of rice straw may offset carbon, N₂O, and fine dust emissions from field burning, a common disposal method for rice straw and wheat straw, resulting in the minerals being retained in the ash. The modernisation of agriculture in developing countries will lead to more rice straw being marketed. This is boosted by increased government efforts to ban farmers from burning rice straw. In Europe, wheat straw (as well as other straw, like rapeseed or barley straw) is viewed as one of the primary feedstocks for the biobased economy given the volume of straw produced every year. The report describes the possibilities for straw including a SWOT assessment of various aspects of rice straw and wheat straw.

+ www.rvo.nl/biomass/crops

The economic and social impact of jatropha

Much has been said about the jatropha crop in recent years. There has been considerable debate on the 'boom and bust' of a wonder crop that also turned out to have considerable drawbacks. Under the supervision of Netherlands Enterprise Agency, three studies have been performed on the different aspects of growing jatropha for bioenergy.

The results have been bundled in a comprehensive assessment, which can be found on the Netherlands Enterprise Agency website. The socio-economic aspects of jatropha cultivation in the assessment are based on scientific research by Janske van Eijck (Utrecht University) and Henny Romijn (Eindhoven University of Technology). Their findings are being published by the open-access journal 'Sustainability' in a special issue focusing on jatropha. The paper presents results from a comprehensive field study about the People-Planet-Profit performance of jatropha projects operating in Mozambique, Tanzania and Mali in 2012. The article aims to derive lessons and single out the salient economic and social impacts.

+ www.rvo.nl/biomass/crops



Rice husk as a feedstock for power plants

Rice husk as a feedstock for generating electricity: nothing seems more logical in a rice growing country such as Indonesia. Up until two years ago, rice husk – a waste product resulting from the rice grinding process – was only reused on Java as fertiliser, or as animal feed or in the brick industry. On Sulawesi, rice husk is simply burned. Dani Hadijono from PT. SyRes Indonesia decided that this had to change.

> Read her story on page 49

Up to December 2008, the government of Mozambique had officially received 12 biodiesel-related investment proposals, almost all related to Jatropha; in total 179,404 ha of land had been requested.



Switchgrass production analysed



Switchgrass is one of the main perennial crops that can be used to produce low cost, low impact lignocellulosic biomass. The crop could have a large impact as demand increases for second-generation fuels that require lignocellulosic biomass. Switchgrass is also one of the crops that may be able to produce reasonable yields at low cost on marginal and lower quality land. This may be one of the ways to source biomass without competing with food crops for land. Thus avoiding the so-called indirect land use change effect (ILUC) A study was carried out by Biobased Research of Wageningen University to critically review the options of switchgrass. The report presents an analysis of the production system and reviews various biobased application options (from energy to biobased chemicals) and discusses relevant sustainability issues.

+ www.rvo.nl/biomass/crops



“We now have to focus on social sustainability criteria.”



DORETTE CORBEY
PRESIDENT COMMISSION
ON BIOMASS SUSTAIN-
ABILITY

From 1999 to 2009, Dorette Corbey was Member of the European Parliament. She is also president of the board of the Dutch Emissions Authority. In addition, she is director of the Advisory Council for Science and Technology.



“Social aspects must play a greater role insustainability criteria”

Over the past few years, sustainability criteria have led to more sustainable biofuels. “Although we have not reached all our goals yet, we now have to focus on social sustainability criteria.”

Dorette Corbey is the current chair of the Dutch advisory Commission on Biomass Sustainability. As a former member of the European Parliament, Dorette Corbey knows how important it is to make sustainable biomass certification work. “In 2008 there was major controversy about biofuels: agricultural organisations strongly believed in biofuels, but there were also many who felt that they were not a good idea, socially, economically or environmentally. The sustainability criteria respond to this controversy. And although these criteria are by no means sufficient, they have ensured that the sustainability and certification of biomass has been afforded more consideration worldwide.” Certification is particularly important for trade developments in sustainable biomass. “Sustainable biomass is more expensive than non-certified biomass or fossil fuels. But without certification biomass will not count towards EU climate targets.”

More social criteria

Sustainable biomass cultivation offers many positive effects, but unfortunately there are also negative effects, says Corbey. “One example is land grabbing, where farmers are driven away from their land, or no longer have access to water.” Corbey would like to see these negative consequences not only eliminated, but also reversed into positive effects. “Biomass production must actually contribute to increased prosperity, better jobs, better infrastructure and better education.” Although much has been achieved in the field of sustainability criteria in the last five years, the criteria are still far

from perfect. “In the next few years it will be very important for us to extend the criteria to include indirect land use change (ILUC). What’s more, the social criteria are not well defined in the current framework. At this time only reporting is required, and this only counts for countries, not even for companies. That is too insubstantial.”

Free Prior Informed Consent

In 2013, Corbey’s Commission on Biomass Sustainability issued advice to include social criteria in the European sustainability framework for biofuels. “Our most important recommendation in this advice is the principle of Free Prior Informed Consent. Thus, a community has the right to give or withhold its consent

“The EU has a responsibility to prevent land grabbing, and therefore we call on the EU to take the lead in establishing social criteria worldwide.”

to proposed projects that may affect the lands they customarily own, occupy or otherwise use. This principle is great, but some guarantees for implementation should also be included. Experience shows that proper arrangements can be easily made on paper. There are examples of companies saying they will build good roads and promising farmers they will maintain water access, but in practice none of these promises

turn out to be kept. In such cases there should be facilities for legal assistance. The EU has a responsibility to prevent land grabbing, and therefore we call on the EU to take the lead in establishing social criteria worldwide.”

Another of the Commission’s recommendations is the inclusion of solid biomass in the criteria of the legislative framework, because the current criteria only apply to biofuels. “There are several reasons for this. We must ensure that the biomass used is indeed sustainable and does not damage forests or soil quality. We are considering a list of solid biomass options with a positive and a negative impact.”

New advanced technologies

In a few years the biobased economy will be looming on the horizon. Corbey believes that we have to develop new technologies for using large amounts of biomass as a feedstock in the chemical industry. She cites the example of the United States. “They are a lot further, especially in developing new advanced technologies for the use of straw and residual in chemistry. To join this trend in the European Union, we have called for an interim target of 0.5 percent for advanced biofuels in 2020. “The commission has calculated that for the Netherlands a budget of approximately EUR 80 million per year is needed for innovation until 2020. This can easily be funded by oil companies or by allocating only half a cent of taxes paid on petrol to R&D.”



Bio-ethanol production from cassava helps farmers in Panama



It took five years, but after adopting the legislative proposal to add 2% of bioethanol to gasoline by the Panama government in 2012, there is finally a market for bioethanol in Panama.

In the middle of Panama, the bioethanol company Agro2 has already started producing bioethanol from cassava on a modest scale. At the moment the company is more than ready to scale-up production and is expanding its pilot plant.

Perfect climate

In this region farmers are poor: over 50% earn no more than a dollar a day, Frans van Hulle, director of Agro2, says. “The soil in this region is perfect for cultivating cassava: it is a poor, acidic soil. The climate is also perfect. That is why in 2007, I started cultivating cassava.” A growing market was expected after the Panama government’s legislative proposal in 2007. By cultivating cassava both for food and ethanol, more farmers are willing to grow the product. “We have, meanwhile, trained over 60 farmers. Furthermore, we built a pilot plant for producing 500 litres of bioethanol per day. To anticipate growing demand, we wanted to scale-up by building a new plant, which could produce 5,000 litres.

During the project it was decided to expand the existing pilot plant. As a result, the new ethanol production capacity will be around 3,500 litres per day.”

Scaling-up production

Agro2’s operation, consisting of its agricultural practices and the demo plant, is the first company in Latin America to receive ISCC certified sustainability. Van Hulle expects production to start in June 2014. During the course of 2014 Van Hulle will continue to scale-up production. “Local government banks are very interested in supporting our project’s growth, because they see a clear opportunity to create a market for local farmers and improve their living standards.”

More?

Agro2
www.agro2.com

Frans van Hulle

www.rvo.nl/biomass/projects



An understanding of the value offered by biomass projects helps investors

The success or failure of sustainable biomass projects depends on a good business case. Hence banks and investors want to obtain an effective understanding of a project's cash flow, value, risks and profit, especially in this economic climate.

An effective understanding of the economic opportunities is essential in order to interest banks and investors in biomass projects. The Dutch consultancy Everest Energy was commissioned by Netherlands Enterprise Agency to develop a model to benefit Sustainable Biomass programmes, in which the project implementers can present their project, standardised and unambiguously, in economic terms to attract investors.

Discounted Cash Flow Model

The tool focuses on the application of the Discounted Cash Flow Model and on making an investment pitch per project. The DCF model systematically displays a calculation for a project's cash flow, value, risks and profit. It presents generic numerical data that is easy for external parties to grasp quickly. The model also appears to provide project implementers with an understanding of investors' questions related to their investment. It allows them to pitch the information that interests the banks in a highly targeted manner. Everest also helped in this aspect, because a standard pitch is available, which entrepreneurs can use, after they have entered their project data, to go straight to the bank and venture capitalists.

Bundling

It appeared that several projects in the Sustainable Biomass programmes were too small to seek funding themselves. Banks prefer not to do business with such small projects. To address this issue it was examined whether several similar biomass projects could be bundled together. They apply for joint funding from banks. The advantage of this is that the risks can be spread, which appeals to banks and investors.

+ www.rvo.nl/biomass/finance

+ <http://everestenergy.nl/large-industrial-users-of-energy-biomass>



“Our framework will make biomass cultivation more sustainable.”



NURIA CUNHA SOARES
LIAISON OFFICER AT
FOUNDATION RURAL
ENERGY SERVICES (FRES)

Nuria Cunha Soares studied at the Rotterdam Business School and at Wageningen University, where she acquired her MSc degree in International Development. She has worked as a researcher for the Netherlands Environmental Assessment Agency (PBL) and for Wageningen University. At the moment, Soares works at the FRES on small scale commercial energy companies in developing countries.



“A framework for sustainable biomass in Mozambique is essential for investors”

“It is important to guide people through the labyrinth of regulations. This goes for investors as well as officials”, explains Dutch researcher Nuria Cunha Soares.

In 2011 and 2012, Soares worked for Wageningen University and Netherlands Enterprise Agency at the Mozambican Ministry of Energy, later moving on to the Ministry for the Coordination of Environmental Affairs. There she sifted through all the nation’s laws in order to identify relevant documents that fit the sustainability criteria for crops such as jatropha, sugar cane and coconut.

Guiding principle

There was a rationale behind embedding these criteria in existing regulations. Like other African countries, Mozambique has learned through experience that not all Western investments in biomass work out the way they were intended. “Investors often have good intentions, but they are soon faced with the harsh reality”, says Soares. “Employees are not satisfied with their jobs and yields are disappointing. After some years the investors go back home, leaving behind a wasteland and unemployed workers.”

“Our framework will be a guiding principle for investors. It provides them with an insight into where they should go for their permits and what can be expected from them. In the end, this will offer them the investment security they need”, Soares says. “And it will make biomass cultivation more sustainable.”

Greenhouse gas indicators

Soares formed the technical secretariat of the Inter-Ministerial Working Group Sustainable Criteria, one of the five working groups established to implement the National Biofuel Policy and Strategy. The group, which was composed

of representatives from the ministries, met once a month to discuss the framework’s content. According to Soares, one of the stumbling blocks appeared to be greenhouse gas (GHG) indicators. “The bulk of the biomass was for domestic use, where measurement of GHG is less important. Moreover, the working group decided not to include GHG indicators so as not to overload investors.”

Goodwill

As such, one draft of the framework did not include a verifiable indicator for GHG emissions, but the criterion was maintained to demonstrate goodwill. In a later version, after the

“Investors often have good intentions, but they are soon faced with the harsh reality.”

framework had been discussed with civil society organisations, the private sector and governmental institutions, it was decided that an indicator for GHG emissions would be included to avoid jeopardising Mozambique’s position as a biofuel exporter to the EU. “But Mozambique has no GHG regulation, so we had to refer to international methods”, says Soares.

Subject of debate

Environmental indicators were also the subject of debate. Companies are obliged to perform

an environmental impact assessment when they plan to set up a biomass farm in Mozambique. So Soares thought that mentioning this obligation in the framework would be sufficient. But NGOs such as the WWF insisted that indicators such as soil and water should be included in the framework.

During her research, Soares noticed that many of Mozambique’s laws are actually pretty solid. For example, if an investor wants to buy land, he can go to the provincial authorities for small areas. But if the area is larger than 1,000 hectares, the investor must obtain approval from the Ministry of Agriculture. The Council of Ministers decides on purchases of 10,000 hectares or more.

Law enforcement

Another law that can be utilised to enforce responsible land use is the so-called ‘Direito de Uso e Aproveitamento da Terra’ (DUAT, land title, as described in the Land Law). This is a provisional permit that can be revoked if the owner does not use the land in a sustainable manner. “So on paper everything looks pretty good. But law enforcement is another issue that requires more money. Maybe donors can help with that”, Soares concludes.



Ten tonnes of biomass pellets were imported from Ukraine to the Netherlands within this project

Pellets for Power: Sustainable biomass imports from Ukraine

A growing demand for sustainable biomass in the Netherlands and a vast amount of underutilised biomass in Ukraine were a match for this project.

Although actual imports were not economically viable, the project yielded valuable knowledge on biomass certification and local sustainable production. Project partners Phytofuel, Tuzetka and Wageningen UR initially focused on switchgrass, but quickly turned their attention to straw and reed too. All three crops could be grown and harvested ILUC-free, as they were produced on degraded lands. Thanks to the partners' knowledge of Dutch certification methods (NTA 8080), local production could be carried out in accordance with this sustainability scheme.

Importing 10 tonnes

Ten tonnes of pellets were eventually imported. Unfortunately this could not be done competitively, because – among other

things – the Dutch market parties and subsidies favour wood pellets.

Nevertheless, the results of the project were twofold: firstly valuable knowledge was acquired of setting up sustainable biomass production abroad, compliant with Dutch regulations. Ukrainian owners of reed fields were instructed to produce in accordance with the sustainability rules laid down in the NTA8080 certification scheme, related to biodiversity etc. Secondly, it taught that reed as a source for pellets is promising, as long as it's considered as a by-product of for example reed for thatching.

+ www.rvo.nl/biomass/projects



THE PROJECT

WHO

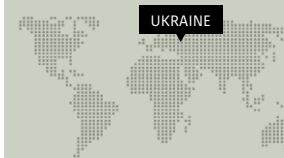
Phytofuel, Ukraine - Tuzetka, Belgium
Wageningen UR, The Netherlands

WHAT

Researching economically viable, sustainable production and imports of biomass pellets from Ukraine.

WHERE

Ukraine





CANDLENUTS

200 tonnes

2010

9,000
tonnes

2013



LET'S GO (CANDLE) NUTS!

Historically candlenut trees on Lombok Island (Indonesia) have been felled for timber. Now the Indonesian government has earmarked candlenut as a 'priority' tree for nature conservation. By planting candlenut trees, rural communities can improve watershed protection, as demonstrated by the project Sustainable Candlenut and Castor Biomass Supply Chains on Lombok Island. Burning shells from the trees replaces unsustainable wood fuel use and diesel/kerosene use by tobacco farmers in the region. It also provides additional income for poor rural communities that can sell the shells to the tobacco farmers. Or to third parties.

FACTS & FIGURES



70%

Candlenut as a feedstock for ovens reduces greenhouse gas emissions by over 70% and is regarded as extremely positive in terms of NTA 8o8o

ACHIEVEMENTS

Supply chain candlenut shells achieved by a consortium, led by Fauna & Flora International (FFI), Siemens and PT Export Leaf Indonesia (ELI). The sustainability assessment of

supply chains has led to a Project Idea Note to implement a plan for financing climate projects. This should also result in sustainability certification for Plan Vivo, the framework for helping communities to manage their natural resources more sustainably.

MORE TO EXPLORE

- + <http://www.sustainabletradeandconsulting.com/completed-projects/lombok-sustainable-energy-initiative/>
- + http://www.bat.com/group/sites/uk_3mfnfen.nsf/vwPagesWebLive/DO933FGD
- + www.rvo.nl/biomass/projects



“Our economy
has to adapt to
the laws of nature.”



DAAN DIJK
MANAGING DIRECTOR
SUSTAINABLE BUSINESS
DEVELOPMENT SBD AT
RABOBANK

Before joining Rabobank in 1999, Daan Dijk worked for almost twenty years as a consultant, project manager and business developer in the energy sector. At Rabobank he focuses on circular economy and biobased business models. He is a member of the Dutch advisory Commission on Biomass Sustainability and the Bio Renewables Business Platform in the Netherlands. In 2007 Dijk was awarded the UNEP Carbon Leadership Award.



“Cooperation with nature is the future”

Last century, the agricultural sector was addicted to oil. This century that position will be changing, according to Daan Dijk. “If we want to last a little longer, we have to cooperate with nature.”

As managing director Sustainable Business Development (SBD) at Rabobank he thinks farms will become biorefineries in their own right. “Crops will be used as feedstock for food as well as for biomaterials, nutraceuticals and to a lesser extent, energy. As we understand nature far better now than we did in the past few centuries, the next level will be cooperation with nature: Agriculture 2.0.”

Farms become biorefineries

Before we can move away from the unsustainable use of fossil fuels, we have to change our mindset, the Rabobank director believes. “Until recently, politicians were looking in the wrong direction. If one takes calories as a lead, most biomass will be used for energy generation. The tortilla crisis in Mexico highlighted this fundamental flaw, hence the resulting food versus energy dilemma. And that’s no wonder: demand for energy by far outweighs global agricultural production. Agricultural output cannot meet it sustainably.”

Plants are really more about molecules than about calories. Thus, it’s better to take molecules as a way of adding economic value. “When farms become biorefineries, only a portion of their harvests is used to generate power and heat. Moreover, we also should pay attention to environmental liabilities. Logging tropical forests for palm oil is not the way, nor is ILUC (indirect land use change). In fact, it’s all about smart agriculture, intelligent land use change is what we need,” the SBD director says.

“Waste equals food”

According to him, our species is just beginning to discover the great possibilities offered by nature. Daan Dijk: “Our economy has to adapt to the laws of nature. That’s been tested for millions of years. Waste equals food. If we want to last a little longer, we have to adopt that model. Thus sustainability is not an ethical luxury. It’s a business imperative. Most companies see resource efficiency, complying with

“The chemical industry will be a client of farmers, instead of the other way around.”

existing laws and regulations and satisfying consumer demand as the main driver towards a sustainable economy, in which microorganisms play an important role.”

Innovative combinations

The SBD director thinks the agricultural and petrochemical sectors will form innovative combinations to take human evolution to a higher level. “Consider the multinational DSM for instance. It started with coal mining, moved from chemistry to nutrition and health and advanced biomaterials. Forward-looking agro businesses will move downstream from feedstock for biopolymers to pharmacy, nutraceuticals and other high-end products,” he says. “In fact, the chemical industry will be a client of

farmers, instead of the other way around. The chemical industry has found out that they need to cooperate with nature and therefore with farmers, and this will also help farmers in developing countries to get more value out of their businesses, enabling them to invest in improving productivity.”

He believes that major biomass production possibilities are emerging in developing countries. “Although there are risks, business advantages can be reached much quicker. Each euro spent there has a much higher multiplier effect on the economy than in the developed world,” he explains.

Nutrients

A lot needs to be done to achieve a robust biobased economy. “Look at nutrients,” exemplifies the CSR director. “In waste water facilities in Western cities approximately 60 million tonnes of nutrients are wasted year-on-year, including scarce phosphates, whereas farms worldwide require 135 million tonnes of mineral fertiliser per year. Nowadays, some water treatment companies are making great efforts to recover them thus returning nutrients to the countryside and closing the loop. It all boils down to ‘adopting the circular model’, which is after all our planet’s basic behaviour mode. Raiffeisen, one of the founders of Rabobank, already said it: ‘if you’re helping your neighbour, you are helping yourself’.”



In the past bagasse was considered waste, now it's feedstock for furnaces in Colombia

Bagasse briquette fuel for trapiches

At first, smallholders were confronted with heavy handling, dirty smoke, high temperatures and high humidity in their daily energy supply routine. Now those working conditions are largely over.

Instead of using fossil fuels, wood and tire scraps, 'La Avención' is drying bagasse, a by-product of sugar cane production. In the past it was considered waste, now it's feedstock for their furnaces, making their trapiches (presses) fuel self-sufficient and better to operate.

Panela

Sugar cane is quite important to Colombian agriculture. Using over 15,000 small trapiches, farmers produce 1.4 million tonnes of panela annually. Panela – or unrefined brown cane sugar – provides income for tens of thousands of poor smallholders and their families. The environmental impact of panela production at the trapiches is substantial. Improvements are needed to avoid energy waste, to increase the sustainability of the biomass chain (harvest

residues and bagasse utilisation), and to diminish GHG emissions due to fuel consumption when drying bagasse that is not dry enough. GMSP, supported by Netherlands Enterprise Agency and in cooperation with Colombian authorities, has launched a pilot project in Yolaombó to adapt trapiches to improve sustainability. A steam extraction scheme has been developed; a storage facility is also used for drying; and a bagasse chipper and bagasse briquetting machine have also been introduced. In addition to the advantages of fuel self-sufficiency, smallholders have obtained higher yields, cut down on operation times, and forest clearing has been reduced.

+ www.rvo.nl/biomass/projects



THE PROJECT

WHO

GMSP, Cooperative Trapiche la Avención

WHAT

Replacing fossil and dirty fuels (such as tire scraps) with bagasse briquettes

WHERE

94 kilometres from Medellín, municipality of Yolombó, Colombia





METHANE CAPTURE

200 tonnes

Palm oil mill effluent replace over 200 tonnes diesel per 100,000 tonnes processed fresh fruit bunches (FFB)

8,4%

More capacity provides smallholders with an extra annual income of 8.4%



CAPTURING METHANE IN INDONESIA

Reducing palm oil effluents, decreasing greenhouse gas emissions and improving smallholders' conditions: a new technology at the palm oil factory in Palembang, Indonesia, addresses all three issues. Under anaerobic conditions, palm oil mill effluents produce CO₂ and methane. Until now, these effluents were discarded in the surface water. Supported by grants from Netherlands Enterprise Agency, Zebra Special Products Inc. introduced a new methane capture and usage system. This system helps to reduce greenhouse gas emissions, although the project didn't yet receive CO₂ credits. In the future, the project may be economically viable if it can concentrate, clean and compress the combustible gas for cooking purposes.

FACTS & FIGURES



80%

Greenhouse gas emissions are reduced by 80% during crude palm oil extraction

1600

1600 smallholders supply to the palm oil mill in Palembang

MORE TO EXPLORE

- + 'Investing in sustainable palm oil production' (ex-ante impact assessment of investments in a palm oil mill in Palembang, Indonesia), LEI, May 2013
- + www.rvo.nl/biomass/projects



LA BARRIÈRE

“The most important thing is education and awareness.”



GUIDO MAURICIO LÓPEZ OCHOA
MEMBER OF THE
BONSUCRO BOARD
OF DIRECTORS

Guido Mauricio López Ochoa is a sugar cane farmer in the Colombian district of the Valle del Cauca. He is President of Procaña, the Colombian association of sugar cane manufacturers and suppliers, and a member of the Board of Directors of Bonsucro, an alliance of stakeholders that aims for a universal sustainable sugar standard.



“Waste is not in our dictionary”

“To use everything that comes from the land in a responsible way. That is what sustainable sugar cane production means”, says the Colombian sugar cane farmer Guido Mauricio López Ochoa. “Waste does not exist.”

And when combined with fair wages, Ochoa is convinced that this production method will guarantee the competitiveness of Colombian sugar cane in the long run. “We cannot compete on price with Brazil. But that may not be necessary if we all become certified sustainable producers.”

Family farm

López Ochoa and his two sisters run a 300 hectare sugar cane farm in the Western Colombian district Valle del Cauca. For the past eight years, he and other farmers in the region have worked to produce sugar cane in a more sustainable manner. “Before, it was only cost and benefit.” Ochoa’s family farm was founded eighty years ago by his grandfather. Today, the farmer leads a company with 25 well-paid employees, all of whom have been educated in sustainable agriculture. “If you pay your employees well, they will work harder for you.”

Unfortunately, sustainable agriculture is not common practice in the region. López Ochoa often invites his colleagues to his farm to show them what sustainability actually means. “The most important thing is education and awareness. Many farmers haven’t even heard of sustainable farming. We can show them the numbers, so they can really see that we are making good profits with our method. I have made money by being sustainable.” And with the assistance of Bonsucro, Ochoa helps other farmers with benchmarks and roadmaps for achieving sustainability.

Residues as fertilizer

What can López Ochoa show these traditional farmers? First of all, an advanced – and not very costly – irrigation system, which is based on hydraulic balancing. “We only consume the amount of water that the plant actually needs. It saves us around 50 per cent on our water consumption.” But there is much more. A common sight in the region is the smoke plumes coming from the fields. Farmers burn the leaves off the stems before harvesting them. This makes harvesting easier, but also sends vast amounts of carbon dioxide into the air. Moreover, precious nutrients go to waste. López Ochoa doesn’t burn the cane, but leaves the litter on the ground. “The residue is broken down, so it reduces the need for fertilizers.” López Ochoa also plants soy between the sugar cane and then lets it rot. Even the residual product vinasse, the result of ethanol production, is spread on the land as fertiliser. “I use less urea now. I used to spend 400 kilos of urea (184 kilos of nitrogen) per hectare. That has been reduced to 200 kilos of urea (92 kilos of nitrogen).”

Climate change

The Valle del Cauca is home to around 2,700 sugar cane farmers, who manage a total of 228,000 hectares of land. The lands in the Valle del Cauca yield approximately 120 tonnes per hectare, which makes it the most productive region in the world. Yet climate change threatens the region. “When it rains, it rains longer and harder. And droughts extend for longer periods.” What can be done? “We can help reduce climate effects by contributing to reforestation and sustainable practices.”

But Ochoa is also realistic. He knows that he cannot do much against global climate change. “Therefore, we should also adapt to climate change. That means more research on crops that are better adapted to wet and dry conditions.”

“The most important thing is education and increasing awareness. Many farmers haven’t even heard of sustainable farming.”

The Valle del Cauca has no more space for new farms or large expansions. “Farmers in the north of Colombia, though, are shifting their business more and more towards sugar cane. They hope to profit from the new regulations that stipulate that fuel must contain 10 per cent bioethanol. Within the next few years this share will increase to 20 per cent.”



An understanding of the value offered by biomass projects helps investors

The food-versus-fuel debate has put the biomass industry in a difficult position. Originally pioneered to reduce dependency on fossil fuels and carbon emissions from transportation, biofuels are now suspected of bringing famine to vulnerable communities.

Netherlands Enterprise Agency seeks practical solutions to this food-versus-fuel dilemma. The question is not food or fuel, but how bioenergy production can be combined with food security. The report *Combining bioenergy production and food security*, carried out by research institute LEI Wageningen UR, shows that biomass production is possible without endangering food security and that good examples are available.

Food-feed-fuel crops are attractive

However, one must ensure that certain conditions are in place at the project and policy level. Among others, bioenergy production should lead to little or no displacement of agricultural land for food production, land titles should be properly addressed, and earning possibilities for low-income households have to increase. What is interesting is that food-feed-fuel crops (such as cassava or maize) are often attractive for smallholders, since they have multiple marketing outlets. The Netherlands Enterprise Agency also cooperates with the Food and Agricultural Organisation (FAO) in the project *Integrated Food Energy Systems*.

The agricultural sector is very important for developing countries as well as for energy security. In the *Integrated Food Energy Systems* project, food and energy crops are grown simultaneously. This involves intercropping, in which energy crops can be used in a smart way alongside food crops as well as using waste flows for energy. Until now only anecdotal information about the impacts of these systems on food security has been available. A methodology is being developed to measure these impacts in a project implemented in association with the FAO.

Energy and food production

The project by Solidaridad, Electrabel and Adiabes in Mozambique also proves that biomass production and food security are reconcilable. The project supports farmers in producing biomass for energy and in their food production. The project has led to a significantly shorter period in which the local population experiences food shortages.

+ www.rvo.nl/biomass/foodsecurity



The Cartaya region has easy access to woody biomass from aged municipal forests

Sustainable import of pyrolysis oil for energy and chemicals

Pyrolysis oil is one of the most promising second-generation bio-liquids. The Dutch company Tree Power has identified a number of opportunities for producing this commodity and importing it from nearby countries, for instance Spain.

Tree Power is the owner of the first commercial pyrolysis plant in the Netherlands. A relative shortage of biomass, a high level of political ambition and the vicinity of the port of Rotterdam created ample opportunities. The Cartaya region in Spain has easy access to marine ports too, as well as to aged municipal forests that require management: a rich potential source for pyrolysis oil.

Refining production techniques

One objective was to technically refine the sustainable production of pyrolysis oil. Knowledge of oil filtering and recycling minerals from pyrolysis ash was acquired.

A self-assessment revealed that by the end of the project, biomass production and conversion complied with the Dutch NTA 8080 sustainability criteria.

Research also focused on the Spanish-Dutch supply chain. An analysis of four available logistics chains showed that transport by ship using tank containers was the most sustainable option. These outcomes provide useful input for follow-up research in Cartaya and on future sites.

+ www.rvo.nl/biomass/projects



THE PROJECT

WHO

BTG Biomass Technology Group,
BTG Bioliqids Tree Energy/Tree Power

WHAT

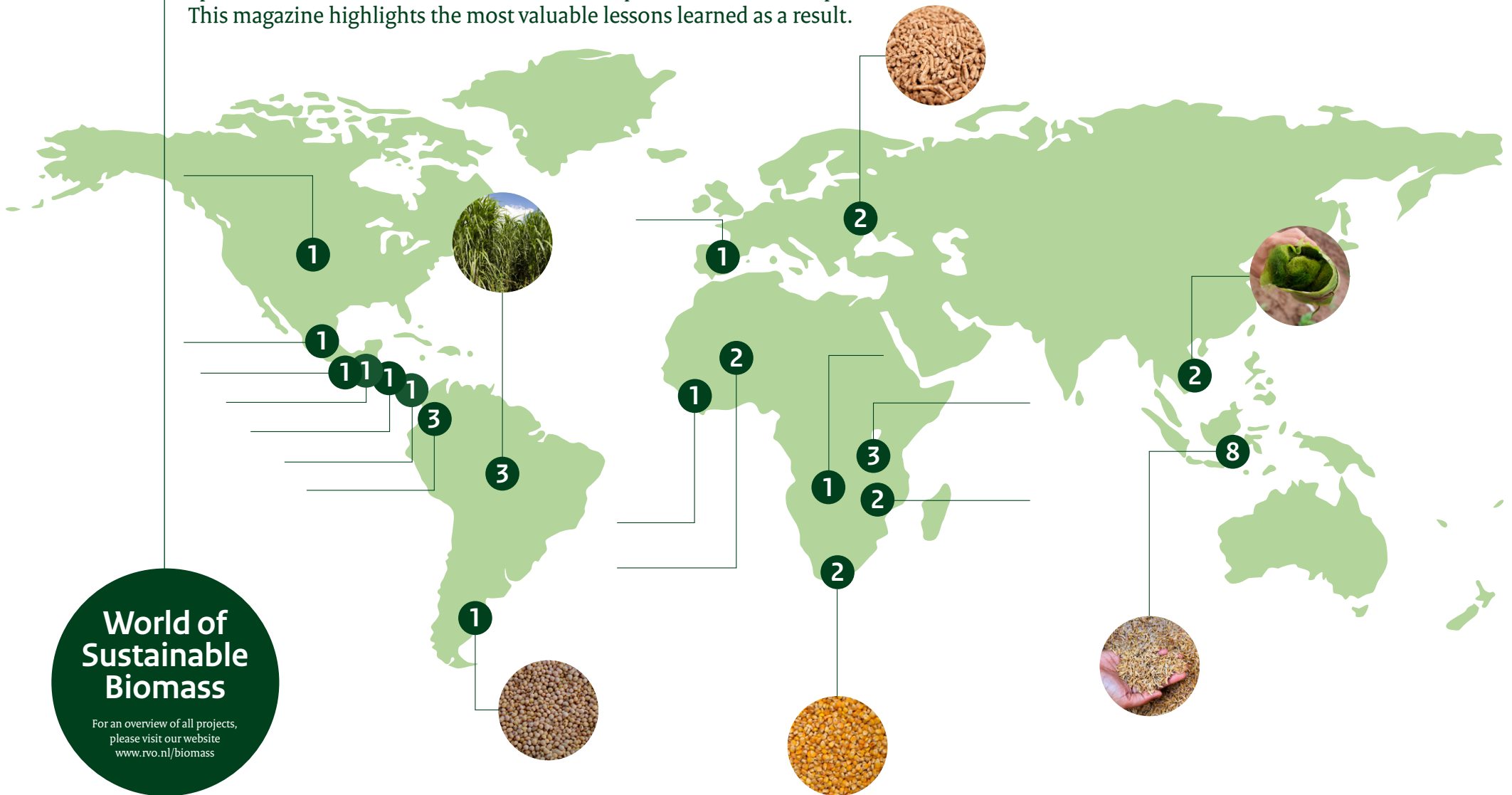
Developing a sustainable pyrolysis oil supply chain from Spain to the Netherlands.

WHERE

Cartaya, Spain



The Netherlands Programmes for Sustainable Biomass, consisting of the Sustainable Biomass Import and Global Sustainable Biomass programmes, have launched 41 biomass projects all over the world. From Indonesia to Spain and from the United States to Mozambique as shown in this spread. This magazine highlights the most valuable lessons learned as a result.



World of Sustainable Biomass

For an overview of all projects, please visit our website www.rvo.nl/biomass



“The markets for biofuels are shifting towards aviation and marine instead of car fuels.”



OLIVIER DUBOIS
SENIOR NATURAL
RESOURCES OFFICER
AND COORDINATOR
OF THE FAO ENERGY
PROGRAMME

Olivier Dubois has worked on land use intensification, forest management and institutional aspects of rural development in more than 40 countries in Africa, Asia and the South Pacific, Latin America, the Middle East and CIS countries.



“Biofuels are here to stay and can work alongside food”

Food security and bioenergy can coexist in a sustainable manner. With the growing demand especially for biofuels and biomaterials there is a strong need for more advanced biofuels. “But first generation biofuels are also going to be around for a while yet.”

This is according to Olivier Dubois, leader of the Energy Team of the UN Food and Agriculture Organisation (FAO). Non-governmental organisations often criticise the use of food crops for bioenergy on the grounds that it occurs at the expense of food security. Dubois says both goals can be reconciled. “There are several ways to combine both goals. Think of so-called flex crops that can produce both fuel and food, like palm oil, sugar cane and cassava.”

Food and energy crops

Dubois emphasizes that it is important to do this in a sustainable and responsible way. “So we need to grow crops that can also be used locally, both as food and as a source of energy. This is why the Government of Tanzania asked the FAO if it was possible to use cassava, which is a food crop, also as a energy crop. In our opinion, it is possible but only in a sustainable manner. Vice versa, using energy crops does not always work well, as we see with jatropha in Kenya. This is an energy crop. While the economic crisis continues companies are not buying jatropha anymore, because it is too expensive. But it is not useful as a food crop.”

Mixed crops

“Another example of the integration of food and energy”, Dubois continues, “is optimising land use by planting mixed crops side by side: both energy and food crops; or you optimise biomass use by using residues of one type of product to produce the other, such as biogas from livestock manure. Good farming practices should help to achieve both energy supply

and food security.” These options are called Integrated Food Energy Systems; this approach will be continued by FAO with contributions by Netherlands Enterprise Agency.

Second generation biomass

The next step is second generation biomass. “These includes cellulosic biomass, which does not directly compete with food. But it is not a panacea. You still have to look at possible negative impacts on food security through land use competition with food production.”

Dubois notes that an increasing number of multinationals are willing to invest in sustainable biomass in Africa, South America and South East Asia. “We have been contacted for example by large aviation companies. They want to know where and how they can obtain more biofuels in a sustainable manner. A number of major biodiesel producing companies have also contacted us with the same question. Finnish company Neste Oil for example is very keen to do it the right way.”

Decision support package

The reason why these companies contacted FAO is because the latter has developed a sustainable bioenergy decision support package. Dubois: “Five, six years ago our knowledge of food security links with bioenergy was very poor. It is a very complex, multifaceted and sensitive topic. So we have been investing a lot in increasing our knowledge, which resulted in our package. Governments and investors can use these tools to assess situations, implement good practices and monitor and evaluate performance at both operational and national levels, so they can do it in the right way.”

Shifting markets

At the same time the markets for biofuels are shifting, says Dubois.

“Good farming practices should help to achieve both energy supply and food security.”

“In the near future I see several trends. First: there is a serious need in Africa for cheaper fuels, either fossil or biobased. Second: the markets for biofuels are shifting towards aviation and marine instead of car fuels, as there are other alternatives to fossil fuels for the latter. And third: large electricity companies are attracted by Africa’s biomass, because they need it to produce cleaner energy in order to reach their climate goals. And that is why I know for sure: biofuels are here to stay! But we should produce them in a sustainable manner. That’s the challenge, and we can do it.”



Highly sustainable wood pellets popular with energy companies



Pellets of residual wood produced in a highly sustainable manner turn out to be in demand for energy production, as demonstrated by the Inbio project.

This project, which Everest Energy launched in the United States in 2010, produces pellets in such a sustainable way that the specifications are not yet included in certification schemes, says Piotr Schade of Everest Energy. “Therefore customers want to wait until sustainability criteria have been adjusted first.”

Residual wood

“In the USA we have been specifically looking for residual wood. In our eyes this type of biomass is the most sustainable, because it does not come from a primary source, such as a tree. And even sawdust comes from a primary source, so we don’t want to use it to produce pellets. We have conducted a lot of research in order to produce the most sustainable biomass, and we have tested many kinds of wood to produce the most sustainable type of residual wood pellets.”

Schade has managed to find these flows of residual wood. “We use different types, which would usually end up at the dump. There they will rot, releasing

methane emissions. We want to avoid this process. Besides, we use several types of wood. So even though we have made it complicated for ourselves the result is highly sustainable.”

Acceleration of sustainable biomass

Energy companies are excited about both the process and the final product, says Schade. “Our process and product therefore leads to an acceleration of sustainable biomass. But we need a sustainability certificate for our product, because the market demands such a label. However, there are several types of certification systems now, and both national and international governments have to decide which one takes precedence because we cannot meet all of them.”

More?

Everest Energy
www.everestenergy.nl

Piotr Schade

www.rvo.nl/biomass/projects



COFFEE WASTE

70%

Up to 70% of the diesel used by a diesel generator in a pulping machine could be substituted with biogas

20%

The aim is to operate 20% of coffee processing units in Nicaragua, Honduras and Guatemala using similar certified biogas installations in 2017



BIOGAS FROM COFFEE WASTE

Coffee producers in Central America are having a hard time earning a sufficient income. With the Energy from coffee waste project in Central America, coffee producers can profit from renewable energy sources. The project focused on methane generated from coffee waste as a source for creating electrical energy. Together with partners UTZ Certified, Fundación Utz Kapeh, Climate Neutral Group, BZ Innovations, Aceres Consultores and Solidaridad, 19 biogas installations have been constructed. With results, for instance in Diriamba, Nicaragua. It is estimated that the wet coffee processing plant, will produce biogas equivalent to an average of 200 thousand kWh of power, which mean annual savings of up to USD 40,000.

FACTS & FIGURES



1,000

In Guatemala, Nicaragua and Honduras 1,000 farmers will be educated about biogas installations

19

At 19 pilot sites in three countries biogas installations have been constructed

MORE TO EXPLORE

- + <https://www.utzcertified.org/aboututzcertified/field-development/2373?lang=en>
- + www.rvo.nl/biomass/projects
- + www.cdmgoldstandard.org/protecting-landscapes-people-and-the-climate



“If we have a 30 to 40% biobased economy in 2050, we will do well.”



PETER PAUL SCHOUWENBERG
MANAGER ENVIRONMENT/
BIOBASED ECONOMY OF
ESSENT/RWE

Under the leadership of Peter Paul Schouwenberg, Dutch energy company Essent became one of the authorities in the biomass market. He developed a track and trace system, which can be used worldwide in the discussions regarding biomass sustainability. Furthermore, he chairs the Top Consortium for Knowledge and Innovation of Biobased Economy in the Netherlands.



“The future of biomass lies in maximising the use of all its resources”

Smarter use of biomass is the mission for the near future. Refining biomass is important to allow us to obtain maximum returns from it. Therefore biomass should be used as a feedstock for new products.

In the late nineties, Essent started using biomass as fuel in its power plant Amercentrale” says Peter-Paul Schouwenberg, Manager Environment-Biobased Economy of energy company Essent/RWE and director of TKI BBE. It used biomass consisting of wood pellets and agricultural residues.

Green Gold Label

Schouwenberg: “To ensure that the origin of the biomass was sustainable, in 2002 we started developing the Green Gold Label. We did not want to introduce another new standard so we aligned certification labels such as PEFC, FSC and the Canadian standard CSA. We have also said that we do not want to certify all biomass within one year. Certification was something new for biomass producers, and it will take time before it is accepted. Our goal was to certify 100% within 10 years. Looking back, we did very well, because we reached 98% last year. However, I am convinced if we had been obliged to reach 100% in 2004, we would have completely failed.”

To help biomass producers worldwide a European certification system would be very useful, according to Schouwenberg. “Producers now receive specific requirements for their biomass from 10 or 12 different countries. Certification is more efficient with the application of a single system

Medicines from wood

Since 2010, there has been increasing demand for a smarter and more sustainable use of biomass, not only as fuel in power plants.

“Together with the scarcity of raw materials this led to the so called cascade system: the optimal use of biomass. Energy companies are using only heating value from wood, while the various components of wood offer much more. Chemical company DSM for instance is able to make medicines out of wood, while the energy sector uses the lower-grade material lignin as a fuel. This requires biorefinery and therefore a whole new industry.”

“The chemical industry’s refining process has to be effective. It allows us to obtain maximum returns from raw materials”

The energy companies however have gained a lot of experience and established good contacts with biomass producers; therefore they have control of certified biomass. That is very valuable for other producers in this new process, says Schouwenberg. “Other sectors in the biomass chain use high quality fabrics. They want to do it the right, sustainable way.”

Bioproducts

That indicates that the output of biomass is shifting: from fuels to multiple commodities. “I see cofiring using biomass as a transition fuel for power plants. In about 20 to 30 years’ time, energy supply will be completely different from today’s scenario. There will be much more

solar and wind energy in 2050. And households will be able to store renewable energy far more efficiently in improved batteries in their own homes.”

Bioproducts

As for bioproducts, however, it will be different, says Schouwenberg. “Biomass is a very important raw material for bioproducts. I would not like to see the chemical industry make the same mistake as the energy sector: do not put all trees in plastic bags. Its refining process has to be effective. In this way we get maximum returns from raw materials, which means that less biomass is needed. I have no illusions that we will have a 100% biobased economy by 2050. If we hit 30 to 40%, we will do well.”

Education

Another important trend is continuous innovation. According to Schouwenberg this requires, permanent stimulus in education. “Many European countries maintain a high level of education. The Netherlands should follow, because our knowledge in the field of environmental technology is in fact our added value. We have to use that in trading. So absolutely vital if we want to keep up.”



SOUTH AFRICA

1,000 ha

Pilot sites in the
Eastern Cape province
(Elliot & Engcobo):
500 ha soybean and
500 ha maize

20,000 ha

Implementation
plan to scale-up to
20,000 ha



CULTIVATING ABANDONED LANDS

At first, the National Development Agency (NDA) was rather reluctant to promote oleiferous crops, fearing such cultivation would take place at the expense of food security and poor populations. This project has shown its South African counterpart that using abandoned lands to cultivate biofuels actually creates a win-win situation. This year soybean and maize were harvested from a thousand hectares. The pilot projects have contributed substantially to rural development in the Eastern Cape province. Smallholder farmers and communities have been given an opportunity to utilise the land that has been redistributed to them through the land redistribution programme. The plan is to increase to at least 5,000 hectares.

FACTS & FIGURES



470

470 jobs! 100 permanent and 150 seasonal jobs at the Elliot site, 20 permanent and 100 seasonal jobs at the Engcobo site

ACHIEVEMENTS

The biomass project was a new experience for both the NDA and Tsebo Consulting (project development). Both parties had never engaged in a public-private partnership and because the project was a pilot, there were bound to be some challenges during implementation.

The biomass project's procurement function, now vested with the NDA, can be moved to the cooperative level. This means that all inputs must be bought at cooperative level as opposed to being procured from the national NDA office. Cooperatives are not subject to PFMA and thus their procurement process would be much shorter.

MORE TO EXPLORE

www.rvo.nl/biomass/projects



For this project field visits were conducted in several districts of West and Central Kalimantan

Consideration for indigenous rights

Certification schemes often incorporate social criteria. However, the latter differ between schemes, and are difficult to monitor in practice.

A standard method for stakeholders' consultation does not exist. The Netherlands Centre for Indigenous Peoples (NCIV) launched a project to identify indicators for measuring the social impact of biomass production on local communities and indigenous peoples in Indonesia. Palm oil plantations are supposed to provide farmers with jobs and social services. In practice, however, things tend to turn rather sour; either the land they're promised is not delivered at all or is not enough for them to make a living. For this project field visits were conducted in various Indigenous Peoples' communities in several districts of West and Central Kalimantan. Consultation on the impacts of palm oil development focused on the social criteria formulated in the Dutch NTA 8080 certification system. These visits with stakeholders offered an array of improvements in social criteria in the NTA 8080 certification system.

Moreover, as a major palm oil importer, the EU should focus more on social criteria in its renewable energy policies. The EU's Renewable Energy Directive includes social aspects in reporting requirements, but these are not included as mandatory criteria.

The Palangka Raya Declaration

The project resulted, for example, in the Palangka Raya Declaration, in which indigenous people's organisations in Indonesia urge the European Commission to do so. The main guarantee indigenous peoples request be implemented is their right to free, prior and informed consent: FPIC for short.

+ www.rvo.nl/biomass/projects



THE PROJECT

WHO
Netherlands Centre for Indigenous People, Oxfam Novib, AMAN (Indonesian NGO)

WHAT
Identifying indicators for measuring the social impact of biomass production on local communities and indigenous peoples in Indonesia

WHERE
Kalimantan, Indonesia





“Already 15 to 20 companies have been granted sustainable certification through the ISPO scheme.”



DADAN KUSDIANA
DIRECTOR OF THE
BIOENERGY PROGRAM
DIVISION OF THE INDO-
NESIAN GOVERNMENT

Dadan Kusdiana studied agricultural engineering at the University of Bogor and earned his PhD at the Japanese Kyoto University with his research on the biodiesel production process. The division is part of the Directorate General of New Renewable Energy, which falls under the Ministry of Energy and Mineral Resources.



“Sustainability standards should be region-specific”

Palm oil is one of Indonesia’s economic cornerstones and provides jobs for millions of Indonesians. Palm oil has also disadvantages, deforestation being one of the most serious. “We are working very hard on that,” says Dadan Kusdiana of the Indonesian government.

The archipelago of Indonesia has become the world’s palm oil power house in recent years. Indonesia took over the lead position from Malaysia in around 2006. Current production of crude palm oil is estimated at approximately 28 million metric tonnes. The government aims to reach 40 million tonnes by 2020.

Since the year 2000, the total area of plantation on the islands of Sumatra and Kalimantan has doubled from 4 million hectares to 8 million. This area is likely to increase to 13 million hectares by 2020. This growth has come at the expense of the deforestation of pristine rain forest, which is the habitat of endangered species such as the Sumatran tiger and orang-utans.

Moratorium on deforestation

“But the Indonesian government has established a moratorium on deforestation to prevent new clearing on 43 million hectares of primary forests and peat lands in 2011. And recently our president decided to extend this moratorium. These are important measures”, Kusdiana says. This moratorium, though, will not apply to companies with existing licenses. Instead of clearing more forests, the government hopes to make better use of degraded lands, such as grasslands, without great amounts of biomass and biodiversity.

Companies

Around 80 percent of all Indonesian palm oil exports to Europe pass through the port of Rotterdam. This makes the Netherlands a very

important trade partner for Indonesia. An increasing number of Dutch companies are demanding sustainable palm oil. Unilever, for example, aims to source all its palm oil from sustainable sources by the end of 2014. And Neste Oil, a Finnish company with an enormous biofuel refinery in the port of Rotterdam, only buys certified palm oil that has been produced sustainably. In a visit by a Dutch trade delegation in November 2013, the Dutch and Indonesian governments agreed to collaborate on making the export of palm oil sustainable.

Indonesian Sustainable Palm Oil

Dadan Kusdiana applauds these efforts. But he adds that it is not easy to agree which sustainable measures or standards should be adopted. “Situations differ from country to country and region to region. Therefore you should not try

“With ISPO-certification we can impose regulations on producers instead of them voluntary adopting measures.”

and establish one and the same standard for all”, he says. This is one of the reasons why the Indonesian government set up its own certification scheme through the Indonesian Sustainable Palm Oil (ISPO) organisation, alongside the globally recognised Roundtable Sustainable Palm Oil (RSPO). “With ISPO we can impose

regulations on producers instead of them voluntary adopting measures”, says Kusdiana. “Already 15 to 20 companies have been granted sustainable certification through the ISPO scheme.”

Refinement industry

Indonesia is investing heavily in building its own refinement industry to produce biodiesel from palm oil. This adds extra value to the product. Indonesia has been supporting the export of biodiesel with low export taxes. Recently, in an effort to protect its own biodiesel industry, the European Union reacted with high import tariffs for biodiesel from palm oil. This prompted the Indonesian government to expand the domestic 10 per cent biodiesel inclusion rate for the transportation sector and apply it to all economic sectors. “Next year, domestic biodiesel consumption will have grown to 4 million tonnes. This consumption will offset the expected decline in exports”, explains Kusdiana.

Domestic consumption

So will this domestic biodiesel consumption come from sustainable palm oil? “For the moment, this will be just ordinary biodiesel. But we are well aware of the fact that this also has to be sustainable at some point.”



Biomass certification authentication tool

Biomass sustainability certification is viewed by many as an essential tool for proving the sustainability performance of a biomass project or biomass to biofuel chain. While certification is in essence a voluntary market instrument (with independent verification), it is increasingly being used by biofuel and bioenergy policy makers as a policy tool.

For example, compliance with EU sustainability criteria for biofuels can primarily be proven by certification by one of the EU approved biomass certification schemes.

Different certification schemes

Many different biomass certification schemes currently exist. Some schemes are specifically aimed at biomass for biofuels, other schemes focus on one particular type of biomass (rather than the type of application for that biomass). Schemes also differ in the way they are governed (e.g. multi-stakeholder governance), the scope of the sustainability aspects covered, and the audit's quality level. The biomass certification scheme that is most appropriate for a specific situation depends on a variety of factors, including but not limited to: type of biomass, envisaged (geographic) market, affordable costs and the views of the relevant stakeholders (e.g. on scheme credibility).

Netherlands Enterprise Agency provides various guidance documents (e.g. How do you select a biomass certification system?) to assist project implementers in selecting the most appropriate certification system.

Guidance

The Smallholder certification in biomass supply chains report provides guidance for companies and others that wish to work with certified smallholders in biomass supply chains. Including smallholders is important for rural development and to ensure that the local economy benefits. Although smallholder certification is a challenge and may not be easy, it also offers benefits by implementing best agricultural practices.

Lusanda Moletsana, South Africa: "When I look at certification systems as the RSB (Round Table of Sustainable Biomaterials), I see a business management system. That is how we are selling it to the farmers. It is a capacity building system, which highlights continuous improvements, production efficiency and legal compliance. Farmers acquire knowledge about their agricultural practices and directly benefit from this."

www.rvo.nl/biomass/certification-assessments-effects



Converting seaweed into ethanol

People in the vast stretches of the Mekong Delta harvest shrimp but, much to their distress, their brackish ponds are often covered by seaweed.

This seaweed is a macro-algae that is toxic to crustaceans and therefore a threat to the income of shrimp farmers. The algae can however be harvested and used as a feedstock for biofuel. No wonder the farmers are willing to cooperate in research to convert seaweed into ethanol.

Public interest in the use of aquatic biomass as a feedstock for the biobased economy is increasing. Aquatic biomass doesn't involve land use while growth rates are much higher than those related to Eukaryotes – single-celled or multicellular organisms – on land.

Blessing in disguise

Algae bloom can therefore be a blessing in disguise: when farmers are paid for harvesting, it can provide an additional source of income as well as feedstock for biofuels and high-quality proteins. The Vietnamese pilot project has resulted in valuable

insights into the sustainability of aquatic biomass as well as its economic feasibility.

Researchers discovered for instance that certain seaweeds could clear the water while simultaneously serving as a food source for shrimp. To make a viable business case in addition to harvesting biofuels, extracting high quality proteins from seaweed is a necessity, as demonstrated by the pilot project.

Aquatic biofuels

This project as well as laboratory tests have paved the way for certification for aquatic biofuels. Results of this project have been shared with the Dutch sector and sustainability certification systems.

+ www.rvo.nl/biomass/projects



THE PROJECT

WHO

The Vietnam Academy of Science and Technology (VAST), the Institute of Tropical Biology (ITB) and Algen Sustainables (US) funded by grants from Netherlands Enterprise Agency and Vietnamese shrimp farmers.

WHAT

Converting seaweed (as a bloom hypoxic to shrimp) into useful protein, 95% dry bioethanol and a bacterial soil product.

WHERE

Small biorefinery in the vast stretches of the Mekong Delta (South Vietnam).





SVEN SIELHORST
INTERNATIONAL
PROGRAMME MANAGER
SUGAR CANE
SOLIDARIDAD

Sven Sielhorst works at Solidaridad as international manager of the sugar cane programme. He also is a member of the advisory board SkyNRG for producing bio-jet fuel for aviation companies. In addition he is a member of the Advisory Board for the Green Gold Label, the certification label for sustainable biomass for energy production, and a member of the Bonsucro Board of Directors, the global initiative for sustainable sugar.

“One of the upcoming trends will be to use biomass more locally.”



“Biomass has fuelled thinking on more sustainable agriculture”

Sustainability certification schemes have done more than just validate biomass sustainability. The rise of biomass use for energy purposes has raised a sense of urgency regarding sustainability.

According to Sven Sielhorst, from the development organisation Solidaridad, certification schemes guide companies in producing biomass sustainably in all areas, not just for the environment. “Take sugar cane for example, the Bonsucro standard, the global standard for sustainable sugar, has led companies not only to improve the environmental impact of their products, but it has also had social effects and it is good for their business.”

This is reflected in reduced expenses related to fertilisers and transport fuels. “Thanks to these standards, companies are working more consciously with these products. In addition, they respect the rule of national law in numerous developing countries, because certification standards demand that companies pay much more attention to this. This includes not only environmental but also land rights. Thus certification gives them a license to operate in these countries.”

Retraining cane cutters

One example where Solidaridad participated and resulted in more than just sustainable sugar cane being grown, is a project in Brazil. “Part of this project involves retraining sugar cane cutters. The mechanisation of the process for harvesting sugar cane has a positive impact on the environment and quality of work as well as on the business case, but has meant that many cutters have lost their jobs. In association with a trade union called FERAESP and the sugar cane industry organisation, UNICA, we set up a program to retrain cane cutters.”

Nationwide

“For example, they learn to work on the machine or on another part of the process. This gives 4 out of 10 cane cutters a new job. The remaining six are retrained to be able to find a job in other sectors of the growing Brazilian economy, such as the construction industry. We have also ensured that women and less-educated men can join these retraining programs. And the great thing is that the Brazilian government has introduced this program nationwide, so it applies to almost all cane cutters.”

“Europe can produce far more sustainable biomass itself”

Using biomass more locally

The past six years have taught us more about which crops are best suited for sustainable biomass. “Previously it was said pretty generically that all biomass was sustainable. Now we know that both production and consumption matter. One of the upcoming trends will be to use biomass more locally, instead of transporting it across the world.” This is also why Sielhorst is pleading for more biomass cultivation in Europe. “In Europe we have been too positive about large scale importation of sufficient biomass for cofiring in power plants. Therefore, it would be good if

the European Union takes a closer look at its own agricultural policy. In Europe there is enough agricultural land to grow energy crops on a large scale, in addition to food crops.”

Radical rethinking needed

There is just one problem: European farmers get paid not to use 10 per cent of their farmland, Sielhorst says. “This is remarkable, because Europe simultaneously calls for more biomass. With obvious reasons: for decades EU agricultural policy focused on food production, causing food surpluses. We also want to preserve landscape values. Enhancing those values can go hand in hand with energy cultivation, but this requires a radical rethinking of how to bundle these goals into a comprehensive policy: food and energy production as well as preserving landscapes.”

With this in mind, he suggests a refinement in agricultural subsidies in Europe. “By using agricultural land for which it is best suited and also by stimulating farmers to produce biomass on their land, Europe can produce far more sustainable biomass itself.”



Sustainable jatropha growing could be attractive for small-scale Tanzanian farmers

Small-scale Tanzanian farmers successfully grow sustainable jatropha

Small-scale Tanzanian subsistence farmers usually grow some cash crops to generate additional income. The Dutch Fairtrade labelling organisation Max Havelaar set out to research the possibility of these farmers growing jatropha.

This would aid small-scale farmers as well as provide jatropha oil as a basis for – among other things – biodiesel.

Three themes

The project focused on three main themes: preserving food security for the local community, economic benefits for the farmers involved and improving local access to energy. The initial idea was for the farmers to grow jatropha for export, but this soon turned out to be economically unviable. Use for a local power grid and local transport did however prove to be worthwhile.

Having established this, the organisations involved launched an agronomic pilot project growing mixed food and jatropha crops.

The results were encouraging, although local farmers replicating the pilot project were less successful. In conclusion, sustainable jatropha growing could be attractive for small-scale Tanzanian farmers, as long as they are properly assisted. Good agricultural practices are vital. That's why the project ultimately yielded a jatropha growing manual for local use.

www.rvo.nl/biomass/projects



THE PROJECT

WHO

Max Havelaar Foundation, The Netherlands
Eneco, The Netherlands
ICCO, The Netherlands
KCU – Kagera Co-operative Union, Tanzania

WHAT

Researching the feasibility of sustainable and Fairtrade certified jatropha by small-scale Tanzanian farmers.

WHERE

Tanzania





COMMUNITY MAPPING

1

The 'One Map Movement' is a national initiative coordinated by the President's Office in collaboration with the Indonesian REDD+ Taskforce, aiming to integrate all the maps covering tenure status, land allocations and permits from all over Indonesia.



FACTS & FIGURES

1,6
million

NGO PPSDAK:
mapping 370
villages, 1.6 million
hectares
(April 2013)



PREVENTING THE 'TRAGEDY OF THE COMMONS'

Large-scale palm oil companies often violate customary land rights ('adat') in densely populated Indonesia, resulting in frequent conflict with local communities. Authorities only possess large-scale drawings, claiming unregistered lands belong to the state. Community mapping can prevent land grabbing by using site identification and participatory land use planning (PLUP). It also takes forests, sacred areas, historical claims and future planning into account. In West Kalimantan, Indonesia, a participatory approach to land use planning and spatial zoning was introduced, achieving sustainable palm oil production as a biofuel source.

MORE TO EXPLORE

- + [http://www.bothends.org/en/Publications/document/105/form/3/Form-for-'Mapping our future'](http://www.bothends.org/en/Publications/document/105/form/3/Form-for-'Mapping%20our%20future')
- + <http://vimeo.com/61715444>
- + www.rvo.nl/biomass/projects

ACHIEVEMENTS

Highlighting the need to integrate community maps in spatial planning procedures & regulations. A step-by-step approach to achieve land-use planning through a participatory process, enhancing sustainability.



“Farmers use the revenues from jatropha as a bonus.”



JANSKE VAN EIJCK
SCIENTIFIC RESEARCHER
(PHD), AT UTRECHT
UNIVERSITY

Janske van Eijck obtained her master's degree from Eindhoven University of Technology. Her thesis explored the possibilities of jatropha oil production in Tanzania. After graduating, she worked for Diligent Tanzania, the first company that produced jatropha oil in Africa. From 2009 till present, Van Eijck conducts research on the socio-economic impact of biofuel at the Copernicus Institute for Sustainable Development and Innovation at Utrecht University.



“Exit strategies and land rights should be integrated in certification schemes”

Biomass offers great opportunities for developing countries. It can help develop rural areas and raise living standards. But to achieve this, local communities should be actively and measurably involved in new projects, says PhD researcher Janske van Eijck.

There are now more than 80 different certification methods for sustainable biomass. Harmonising these methods could provide more clarity. Moreover, socio-economic factors should be integrated in these methods more vigorously.”

Janske van Eijck is no layman. She will graduate in April next year from Utrecht University with her study of the relationship between biomass and local communities. Before her PhD, she was a manager at the Tanzania-based Dutch company Diligent, which bought jatropha seeds from farmers to process them into oil and biodiesel.

Bonus

Diligent collected the jatropha seeds at the farms and paid the farmers around ten euros for a kg. Farmers grow jatropha on their lands, but this is usually not the primary crop. It is often used as a boundary marker for their property. Van Eijck explains: “Farmers use the revenues from jatropha as a bonus. They do not depend on it, but this doesn’t mean it isn’t good money. They can use it to purchase extra fertiliser or save it for their children’s education.”

‘Gold rush’

For a short while, jatropha was seen as one of the most promising energy crops in Africa. This led to a modest ‘gold rush’ in Tanzania and other parts of Africa. “Cowboys,” as Van Eijck describes the entrepreneurs that were attracted to the crop. “This optimism was based on an incorrect picture. Some people thought that yields could reach ten tonnes per hectare.

The reality was different. Most farmers collect roughly one tonne per hectare. With some changes in the way the land is cultivated one could reach perhaps three tonnes, but not ten. So those business cases were shaky.”

“Oil production in the vicinity of the communities means that knowledge and value stay where it belongs. And it emits less carbon dioxide.”

Hurdles

Because of her experiences with jatropha and by studying crops such as oil palm, sugar cane, cassava and eucalyptus, Van Eijck is familiar with the hurdles that must be overcome on the road to sustainable biomass production. “A real danger is the termination of projects, with no real exit strategy.” When entrepreneurs start a plantation, they often buy out farmers with some money and the promise of future employment. But when these businesses go bankrupt, farmers repeatedly end up with nothing. They lose their land and their job, but acquire a great deal of suspicion.

Exit strategies

“Exit strategies and land rights should be integrated in certification schemes. Otherwise they will be nothing more than good intentions, which could easily be violated,” says Van Eijck. The Global Bioenergy Partnership (GBEP) and

the Roundtable on Sustainable Biomaterials (RSB) in Lausanne are two organisations that understand these issues.

Higher revenues and lower costs

A focus on social factors should never lead to a disregard for economics: a thriving business needs a positive net present value (NPV). Several factors can lead to higher revenues and lower costs. Research should be conducted on improving the crop. The Belgian company Quinvita is playing an important role in the case of jatropha. Innovation of the pressing process is also needed in order to optimise oil extraction. And press machines that turn the press cake into usable fertiliser or charcoal add more value to the seeds.

Communities

Van Eijck also pleads for oil production in the vicinity of the communities. This means not shipping the raw biomass overseas, but just the refined oil. “It means that knowledge and value stay where it belongs. And it emits less carbon dioxide.” Van Eijck: “In the end these improvements will lead to higher prices for farmers. So they too will profit.”



In Brazil a large number of cane cutters have been retrained (see also page 40)

Methodology developed for Low Indirect Impact Biofuels (LIIB)

A team of researchers, biofuel practitioners and NGOs has now succeeded in compiling a practical, widely applicable methodology for ensuring the cultivation and production of Low Indirect Impact Biofuels (LIIB).

One of the options for public and private parties in the biofuels market to demonstrate the sustainability of biofuel production is to engage in a sustainability certification scheme. However, one of the key sustainability challenges to be addressed for bioenergy is indirect land use change (ILUC). So far, this has not been incorporated in certification schemes. In this project a team working on sites in Indonesia, South Africa, Mozambique and Brazil for just under four years, compiled the data for a new methodology. László Máthé, of WWF International: “If a company approaches us and says ‘We want to do the right thing and produce biofuels without the risk of indirect land use change’, we can now tell them how to go about it. Conversely, if public authorities want to know whether a certain company is ‘doing the right thing’, they

now have the means to assess it,” says Máthé. “The certification methodology should ideally be used in combination with a more comprehensive sustainability standard (such as the Roundtable on Sustainable Biofuels Standard) and not as a stand-alone methodology.” The LIIB methodology allows producers and users of a wide variety of biofuels to demonstrate and claim bio-fuel production with a low risk of indirect land use change. The Roundtable on Sustainable Biofuels has adopted the module in its scheme.

+ www.rvo.nl/biomass/projects



THE PROJECT

WHO

Ecofys, EPFL (hosting the RSB Secretariat), WWF International, Wageningen University, DNV and the University of São Paulo

WHAT

A method for producing low ILUC risk biofuels: LIIB

WHERE

Indonesia, South Africa, Mozambique and Brazil





BAMBOO

AS THE NEW GREEN COAL

20 to 40 tonnes

Bamboo presents a high biomass density and yield of 20 to 40 tonnes of bamboo culm (dwt) per hectare per year

5-8 euro

Torried bamboo pellets could cost 5 to 8 euros per GJ



BAMBOO

Bamboo has the potential to be a sustainable biomass source for renewable heat and power production, and is also used for the production of chemicals and construction materials. Its heating value could be higher than many woody biomass feed stocks and most agricultural residues. In a project by ECN, supported by Netherlands Enterprise Agency, in Colombia, bamboo has been optimised as an energy source by means of torrefaction. Results show that the bamboo species *Guadua angustifolia* is a good candidate for replacing coal in power plants.

FACTS & FIGURES



90%

Torried solid biomass contains about 90% of its original energy content.

250°-320°C

Torrefaction of bamboo is done between 250° and 320° Celsius for 30 minutes.

MORE TO EXPLORE

- + <http://www.bambooitem.com/bamboo-charcoal/cgpl.iisc.ernet.in/site/Portals/0/Publications/NationalConf/torrefactionofbamboo.pdf>
- + www.ieabcc.nl/workshops/task32_2012_Milan/Kiel/ECN-torrefaction.pdf
- + www.rvo.nl/biomass/projects



“We need
to regulate
forests.”



BAH F.M. SAHO
RENEWABLE ENERGY
EXPERT ECREEE

Bah F. M. Saho joined ECREE, the ECOWAS Centre for Renewable Energy and Energy Efficiency, in 2010. ECOWAS is the economic community of 15 West African states. Before that, Mr. Saho was the Director of Energy in the Gambia for ten years. The policy maker holds a Master's degree in Renewable Energy and the Environment.



“Sustainable biomass begins with responsible forest management”

West Africa should focus on its own domestic market for biomass, before considering large scale export to Europe or the United States, says Bah Saho, renewable energy expert at ECREEE.

The socio-economic and environmental problems associated with overdependence on traditional biomass is so serious that export is of secondary concern, says Bah Saho, renewable energy expert at ECREEE, the renewable energy organization of ECOWAS.

Saho oversees an alliance of 15 states, spanning a total area of more than 5 million square kilometres. That is larger than the whole of the European Union. ECOWAS has a population of 300 million people, half of which have no electricity. Eleven of the fifteen countries are considered poor. The majority of the population lives in rural areas.

Traditional biomass

Around 80 per cent of the region's total energy demand comes from traditional biomass, or wood and charcoal from the forest. Eighty per cent of households depend on this energy source, be it in the form of wood or charcoal. Because of the ever-growing population, especially in urban areas, demand exceeds the amount the forests can currently supply. Especially since firewood is gathered in a highly unsustainable manner.

Deforestation

“ECREEE's mandate doesn't extend to forest management, but we have to collaborate with other organisations to make this possible. Deforestation is a huge problem, which directly affects our communities and economies,” says Saho. “Bioenergy, deforestation and a growing population, are all closely linked in a complex system.”

Regulation of forests

To stop this downward spiral, changes must be made on the supply side as well as on the demand side. “We need to regulate forests. The majority of the forests have no owner and therefore people just take whatever they want. It is a market that requires better regulation. Forests managed properly by the communities in rural areas and the establishment of ‘Rural Wood Energy Markets’, with the support of local communities, can yield more in a sustainable and effective manner,” explains Saho.

“We don't want to think about large scale exports of bioethanol. We have ourselves to think about.”

“Maybe this will lead to higher prices in the short term. But we have to realise that prices for firewood have already doubled in the last couple of years, and they continue to increase due to problems associated with supply. Several member states don't have policies for bioenergy and deforestation. We are working with member states to put in place a Regional Bioenergy Policy sometime in late 2014.”

LPG and biogas

On the demand side, Bah Saho has long promoted the introduction of efficient cooking stoves in households.

They use less wood, which eases the pressure on the forests. But alternative fuels should have a fair chance too. Bah also mentions LPG, even though it is a fossil fuel. “It may be fossil, but it is the cleanest fossil fuel for cooking. As a matter of fact, it emits less carbon dioxide than firewood from unprotected forests.”

Biogas should also be promoted, according to Saho. It could be extracted from animal and agricultural waste products, or from pest plants, like some weeds. This waste could also be pressed into briquettes. Lastly, the enormous pile of municipal solid and liquid waste from the cities should be put to good use. “It just lays there on landfills, but it is also energy just waiting to be processed.”

Exporting bioethanol

But couldn't West African make good money from exporting energy crops and sustainable produced biomass, as Brazil has been doing for years? “Some ECOWAS member states have started in a modest way and already produce some bioethanol such as in the Makeni project in Sierra Leone and also in Senegal. But large scale exports, we don't want to think about that for the moment. We have ourselves to think about.”



How to feed local power plants with rice husk



Rice husk as a feedstock for electricity generation: nothing seems more logical in a rice growing country such as Indonesia.

Up until two years ago, rice husk – a waste product resulting from the rice grinding process – was only reused on Java as fertiliser, or as animal feed or in the brick industry. On Sulawesi rice husk is simply burned.

Change

Dani Hadijono from PT. SyRes Indonesia decided that this had to change. “Four years ago I started with this idea in Indonesia. I did a lot of research into where to start small power plants using rice husk as the feedstock. I chose Java and Sulawesi. In Java I would have to face competition from other re-users of rice husk, but that was not the case on Sulawesi.

The key, however, is that there must continuously be enough rice husk and that logistics and the business are being managed properly.”

To finance the two power plants she appealed to the banks, but they did not respond enthusiastically straight away. “Just at that moment I came across the Global Sustainable Biomass Fund and I applied and received funding.”

Expansion

Hadijono started out energetically two years ago with two small power plants (500 kW plants). They are doing well, Hadijono says. “We have 75% lower operating costs than conventional power plants. That is also the reason why I ‘m working on expansion. For that I need sufficient feedstock, so I am talking to the largest farming organisation in Indonesia, KTNA.”

Shareholding for farmers

In addition, the farmers are the main stakeholders, so I am looking for a sort of shareholding with these farmers in the power plants. Because we want to create a win-win situation for all the stakeholders.”

More?

PT SyRes Indonesia
syres-indonesia.com

Hoedani Hadijono

www.rvo.nl/biomass/projects



Take a stand

“Because we understand nature far better than we did in the past few centuries, the next level will be to cooperate with nature: Agriculture 2.0.”

Daan Dijk, Rabobank



“The farmers are the main stakeholders, so I am looking for a sort of shareholding with these farmers in our power plants, which use rice husk as a feedstock for electricity generation.”

Dani Hadijono,
PT. SyRes Indonesia

“Biofuels are here to stay, but we should produce them in a sustainable manner. That’s the challenge, and we can do it.”

Olivier Dubois, FAO

“The EU has a responsibility to prevent land grabbing, and therefore we call on the EU to take the lead in establishing social criteria worldwide.”

Dorette Corbey,
Commission on Biomass Sustainability

“The Low Indirect Impact Biofuels (LIIB) should ideally be used in combination with a more comprehensive sustainability standard, such as the Roundtable on Sustainable Biofuels Standard, and not as a stand-alone methodology.”

László Máthé, WWF International

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