

## WB/WWF Biofuels Environmental Sustainability Scorecard<sup>1</sup>

<b>Country/ Organization</b>	World Bank/World Wildlife Fund (WWF)	<b>Year and status</b>	2008 (in operation)
<b>Initiative</b>	Biofuels Environmental Sustainability Scorecard		
<b>Membership</b>	-		
<b>Governing bodies</b>	-		
<b>Type and implementation approach</b>	Scorecard for initial screening of biofuel projects	<b>Geographical coverage</b>	Global
<b>Feedstock(s) covered</b>	All	<b>Supply chain coverage</b>	Biofuel feedstock production and processing
<b>Type(s) of biofuels covered</b>	All		
<b>Link</b>	-		

### Overview.

The objective of the World Bank/WWF Biofuels Environmental Sustainability Scorecard is to provide an indication of whether a proposed biofuel project is likely to have a (net) positive or negative impact on the environment. The Scorecard, which was modelled on the WWF-World Bank Protected Areas Management Effectiveness Tracking Tool, aims to serve as a guide, facilitating consideration of key environmental (as well as social) issues in biofuel projects.

The Scorecard allows the user, through a descriptive scoring system, to:

- compare different biofuels and different biofuel production systems across key criteria in terms of environmental sustainability;
- understand what kinds of changes to production systems would result in more sustainable production; and
- track progress in improving sustainability over time.

The Scorecard is divided into four key components, under which the various environmental and social issues addressed in the Scorecard were included:

- *Must Haves*: those attributes that a project must have in order to meet the sustainability test;

<sup>1</sup> The information included in this document was excerpted and adapted from the following report, which was provided directly by WWF-US: McLaughlin, D.W. 2008. *World Bank/WWF Biofuels Environmental Sustainability Scorecard*.

- *Project Design*: those attributes that can be influenced and improved upon through project design;
- *Management*: management issues that project management can influence and direct the outcome of; and
- *Social/Labor*: key labor and social issues.

Users of the scorecard shall provide yes/no answers for the Must Haves component, while for the other three components answers will range from 0 to 3 depending on the chosen option.

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Ismail, M., & Rossi, A. 2010. *A Compilation of Bioenergy Sustainability Initiatives*. Rome: Food and Agriculture Organization of the UN (FAO).

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BIOFUELS ENVIRONMENTAL SUSTAINABILITY SCORECARD			
ASPECTS/ISSUES	COMPONENT	OPTIONS	SCORES
<b>1. ENVIRONMENTAL</b>			
1.1 Land-use change (direct and/or indirect)	Must Haves: Project must meet all conditions in this section <ul style="list-style-type: none"> <li>Land Conversion</li> </ul> <i>Does the establishment of the crop require a significant land use change?</i>	The establishment of this crop does not require the conversion of natural ecosystems, critical natural habitats, or carbon sinks to crop land (e.g. forests, peat lands, wetlands, grasslands).	Yes/No
	See <a href="#">Management – Basic Processing</a> on production capacity near natural habitat high risk area at aspect/issue 1.6 GHG emissions.		
1.2 Biodiversity and ecosystem services  <a href="#">Back to table of contents</a>	Must Haves: Project must meet all conditions in this section <ul style="list-style-type: none"> <li>Biodiversity</li> </ul>	A biodiversity assessment has been conducted utilizing tools such as IBAT and has established that the design and/or location of the project will have insignificant impacts on site- and landscape/watershed-scale terrestrial and freshwater biodiversity.	Yes/No
	Must Haves: Project must meet all conditions in this section <ul style="list-style-type: none"> <li>Protected Areas</li> </ul>	This project will not encroach on an existing, planned, or proposed protected areas, nor any critical natural habitats. Also the project's location will not have adverse impacts on protected areas and critical natural habitats in proximity to or within shared watersheds of the project site.	Yes/No
	Management: Those attributes that management can influence <ul style="list-style-type: none"> <li>Project Infrastructure</li> </ul>	<b>Impacts of key production infrastructure (buildings, warehouses, housing, roads) to buffer zones and sensitive areas (riparian zones, protected areas, wetlands, fragments of natural habitats) were <u>not</u> contemplated in project design.</b>	0
		Impacts of key production infrastructure (buildings, warehouses, housing, roads) to buffer zones and sensitive areas (riparian zones, protected areas, wetlands, fragments of natural habitats) were contemplated in project design, but have not been properly addressed.	1
		Impacts of key production infrastructure (buildings, warehouses, housing, roads) to buffer zones and sensitive areas (riparian zones, protected areas, wetlands, fragments of natural habitats) were contemplated in project	2

BIOFUELS ENVIRONMENTAL SUSTAINABILITY SCORECARD			
ASPECTS/ISSUES	COMPONENT	OPTIONS	SCORES
1.2 Biodiversity and ecosystem services (continued)	Management: Those attributes that management can influence <ul style="list-style-type: none"> <li>• Project Infrastructure (continued)</li> </ul>	design, but have only been partially addressed.	
		Impacts of key production infrastructure (buildings, warehouses, housing, roads) to buffer zones and sensitive areas (riparian zones, protected areas, wetlands, fragments of natural habitats) were contemplated in project design and have been fully addressed or were insignificant.	3
	Management: Those attributes that management can influence <ul style="list-style-type: none"> <li>• Basic Processing</li> </ul> <p><i>For the case of <b>agricultural feedstock production</b>: How close is the processing facility and have capacity requirements been reviewed?</i></p> <p><i>For the case of a processing facility: Is there sufficient agricultural production to utilize existing capacity?</i></p> <p>[Also relevant to aspect(s)/issue(s): <a href="#">1.1</a> Land-use change (direct and/or indirect).]</p>	Accessible production capacity does not exist; OR accessible production capacity does exist in the vicinity, but it is <b>in an area at high risk for conversion of remaining natural habitats</b> .	0
		Accessible production capacity does not exist, but planning is currently underway to establish or increase production capacity in the near future. (1-2 years.)	1
		Accessible production capacity does not exist but this capacity is currently being established.	2
		Accessible production capacity exists in the vicinity, and installed capacity is sufficient for the incremental production.	3
1.3 Productive capacity of land  <a href="#">Back to table of contents</a>	Site and Crop Design: Those attributes that site design can influence <ul style="list-style-type: none"> <li>• Topography</li> </ul>	No topographical map has been developed for the project area.	0
		A topographical map exists for the project area, and an erosion assessment has been made, but these recommendations have not been implemented.	1
		A topographical map exists for the project area, and an erosion assessment has been made, but these recommendations have only been partially implemented.	2
		A topographical map exists for the project area, and an <b>erosion</b>	3

BIOFUELS ENVIRONMENTAL SUSTAINABILITY SCORECARD			
ASPECTS/ISSUES	COMPONENT	OPTIONS	SCORES
1.3 Productive capacity of land (continued)		<b>assessment</b> has been made, and these recommendations have been fully implemented.	
	See <a href="#">Site and Crop Design – Marginal Lands: Soil Suitability</a> on soil assessment for biofuel crops at aspect/issue 2.7 Good management practices and continuous improvement.		
	Management: Those attributes that site design can influence <ul style="list-style-type: none"> <li>• Soil Erosion</li> </ul>	No effort is made to control soil erosion through no till, contour planting, sediment traps, buffer zones, cover crops, terracing, road construction or by other means.	0
		A marginal effort is made to address soil erosion concerns, but these efforts are the exception.	1
		Some effort is made to address soil erosion, but there is still room for improvement.	2
		Soil erosion is a key criterion in farm layout, planting methodologies and farm management.	3
	See <a href="#">Management – By Product Processing</a> on by-products and waste stream for generation of electricity, soil organic matter and other uses at aspect/issue 1.8 Waste management.		
1.4 Crop management and agrochemical use  <a href="#">Back to table of contents</a>	Site and Crop Design: Those attributes that site design can influence <ul style="list-style-type: none"> <li>• Invasive Species</li> </ul>	The introduction of this crop will require the introduction of non native species, either as the crop, cover crop, or beneficial organism, and there is clear evidence that these non native species are invasive.	0
		The introduction of this crop will require the introduction of non native species, either as a crop, cover crop, or beneficial organism, and there is uncertainty as to whether these non native species are invasive. Research and expert consultation have been inconclusive.	1

BIOFUELS ENVIRONMENTAL SUSTAINABILITY SCORECARD			
ASPECTS/ISSUES	COMPONENT	OPTIONS	SCORES
1.4 Crop management and agrochemical use (continued)  <a href="#">Back to table of contents</a>	Site and Crop Design: Those attributes that site design can influence <ul style="list-style-type: none"> <li>Invasive Species</li> </ul> (continued)	The introduction of this crop will require the introduction of non native species, either as a crop, cover crop, or beneficial organism, and there is evidence in the region that this species is not invasive with proper control measures.	2
		The introduction of this crop will not require the introduction of non native species as a crop, cover crop, or beneficial organism.	3
	Management: Those attributes that site design can influence <ul style="list-style-type: none"> <li>Agrichemical Applications</li> </ul>	Does not meet World Bank Pest Management Policy (OP 4.09). Pesticides used include WHO Class 1A and 1B. Integrated pest management is not practiced.	0
		Partial compliance with World Bank Pest Management Policy (OP 4.09) in that WHO Class 1A and 1B are not utilized, but integrated pest management is not practiced.	1
		Fully compliant with World Bank Pest Management Policy (OP 4.09).	2
		Production is organic	3
	Management: Those attributes that site design can influence <ul style="list-style-type: none"> <li>Agricultural Chemical Storage.</li> </ul> <i>Are there adequate facilities to store and handle all agrichemical products?</i>  <i>Are these facilities located away from natural water sources and away from areas of human activity?</i>	No facility exist for safe handling and storage of agricultural chemicals (warehouse, impermeable floor and shelving materials, adequate ventilation, away from natural water courses and sources, away from housing or other areas of human activity).	0
		Facilities exist for storage and handling, but they do not meet the following criteria: impermeable floor and shelving materials, adequate ventilation, away from natural water courses and sources, away from housing or other areas of human activity.	1
		Facilities exist for storage and handling, and they partially meet the following criteria: impermeable floor and shelving materials, adequate ventilation, away from natural water courses and sources, away from housing or other areas of human activity.	2
		Facilities exist for storage and handling, and they meet the following criteria: impermeable floor and shelving materials, adequate ventilation, away from natural water courses and sources, away from housing or other areas of human activity.	3

BIOFUELS ENVIRONMENTAL SUSTAINABILITY SCORECARD			
ASPECTS/ISSUES	COMPONENT	OPTIONS	SCORES
1.5 Water availability and quality  <a href="#">Back to table of contents</a>	Site and Crop Design: Those attributes that site design can influence <ul style="list-style-type: none"> <li>• Crop Water Needs and Water Sources</li> </ul>	No assessment has been made for crop water needs and sources, or an assessment has been made and has determined that there is not sufficient water for crop needs and all other users.	0
		An assessment has been made for crop water needs and sources, and it is doubtful that there will be sufficient water for all users.	1
		An assessment has been made for crop water needs and sources and has determined that there is sufficient water for all users.	2
		Crop water needs are met by natural rainfall	3
	Site and Crop Design: Those attributes that site design can influence <ul style="list-style-type: none"> <li>• Downstream Water Reliability</li> </ul>	No assessment of downstream water resource impacts has been performed, or an assessment has been made and the proposed project results in more intense or prolonged droughts downstream of its source location.	0
		An assessment of downstream water resource impacts has been performed and shows that the project may decrease the reliability of water downstream	1
		An assessment of downstream water resource impacts has been performed and shows that the project has little impact on the reliability of water downstream.	2
		An assessment of downstream water resource impacts has been performed and shows that the project has no impact on the reliability of water downstream.	3
	Management: Those attributes that management can influence <ul style="list-style-type: none"> <li>• Irrigation</li> </ul> <i>Is there a management system that measures key parameters prior to making water applications?</i>	There is no technical process of measuring soil moisture, soil moisture retention, and evapotranspiration for determining water application amounts and frequency.	0
		A technical process exists to measure soil moisture, soil moisture retention, and evapotranspiration, but it is seldom used when making a decision to irrigate.	1
		A technical process exists to measure soil moisture, soil moisture retention, and evapotranspiration, but it is not always used when making a decision to irrigate.	2
		A technical process exists to measure soil moisture, soil moisture	3

BIOFUELS ENVIRONMENTAL SUSTAINABILITY SCORECARD			
ASPECTS/ISSUES	COMPONENT	OPTIONS	SCORES
1.5 Water availability and quality (continued)		retention, and evapotranspiration, and it is always used when making a decision to irrigate OR no irrigation systems are required.	
	Management: Those attributes that site design can influence • Irrigation Systems	Flood irrigation is used.	0
		Skip furrow irrigation is used.	1
		Center pivot or overhead sprinkler irrigation systems are used.	2
		Drip or under tree micro jets irrigation is used, OR no irrigation systems are required.	3
	Management: Those attributes that site design can influence • Conversion Process Water Use  (If Applicable: Processing facilities are part of project proposal.)  [Also relevant to aspect(s)/issue(s): <a href="#">1.8</a> Waste management.]	No management plan exists to monitor and reduce and recycle water use over time in the conversion process.	0
		While a formal management plan to monitor, reduce and recycle water use does not exist, some efforts are being made to monitor water use over time.	1
		A management plan does exist to monitor, reduce and recycle water use, but it is not fully implemented or followed.	2
		A management plan does exist to monitor, reduce and recycle water use and it is fully implemented and functional.	3
	1.6 GHG emissions  <a href="#">Back to table of contents</a>	Must Haves: Project must meet all conditions in this section • Project Feasibility Study and GHG Life Cycle Assessment	A project feasibility study and life cycle GHG assessment have been performed by a qualified assessor and concludes that the project is feasible and is carbon negative (including emissions from direct and indirect land use change). In the case of short cycle annual crops (e.g. soybean, corn, beets) the project is carbon negative at the end of the growing season.
Site and Crop Design: Those attributes that site design can influence • Net Carbon – Balance Perennial Crops  <i>From a carbon standpoint, how efficient is the crop? Is the payback period short or long term?</i>		The GHG life cycle assessment shows that the payback period in terms of carbon, including the carbon lost above and below ground during the establishment and operation of the project, is 75%-100% of economic life of the project. In terms of carbon, this project does achieve breakeven.	0
		The GHG life cycle assessment shows the payback period in terms of carbon, including the carbon lost above and below ground during the establishment and operation of the project is 50% to 75% of the economic life of the project.	1
		The GHG life cycle assessment shows the payback period in terms of	2

BIOFUELS ENVIRONMENTAL SUSTAINABILITY SCORECARD			
ASPECTS/ISSUES	COMPONENT	OPTIONS	SCORES
1.6 GHG emissions	<i>(Including direct and induced land change)</i>	carbon, including the carbon lost above and below ground during the establishment and operation of the project is 25% to 50% of the economic life of the project.	
		The GHG life cycle assessment shows the payback period in terms of carbon, including the carbon lost above and below ground during the establishment and operation of the project is equal to or less than 25% of the economic life of the project.	3
1.7 Air quality	Management: Those attributes that site design can influence <ul style="list-style-type: none"> <li>• Key Agricultural Air Emissions</li> </ul>	Burning is used in land preparation operations and/or is also used as part of ongoing harvesting practices.	0
		Burning is partially used in land preparation operations and/or is used as part of ongoing harvesting practices.	1
		Burning is not used in land preparation operations and/or management is phasing out burning as part of ongoing harvesting practices.	2
		Burning is not used in land clearing operations and/or it is not used as part of ongoing harvesting practices.	3
1.8 Waste management <a href="#">Back to table of contents</a>	Management: Those attributes that management can influence <ul style="list-style-type: none"> <li>• By Product Processing</li> </ul> [Also relevant to aspect(s)/issue(s): <a href="#">1.3</a> Productive capacity of land.]	The processing facility for the biofuel does not use any of the by-products for generating energy for processing, organic matter for the crop, or for other uses or products.	0
		The processing facility has begun to evaluate the use of by-products for electrical generation, organic matter and other value-added uses.	1
		The processing facility captures a portion of the by-products for electrical generation, organic matter and other value-added uses.	2
		The processing facility <b>utilizes all of the by-products and waste streams</b> for generating electricity, <b>soil organic matter, or other value-added uses.</b>	3
	Management: Those attributes that management can influence <ul style="list-style-type: none"> <li>• Waste Management</li> </ul>	Production wastes are not managed or treated	0
		A portion, but not all, of the production waste streams is managed and treated.	1
		Management systems are in place for all production wastes	2
		Production wastes are treated and used to improve soil organic matter or	3

BIOFUELS ENVIRONMENTAL SUSTAINABILITY SCORECARD			
ASPECTS/ISSUES	COMPONENT	OPTIONS	SCORES
1.8 Waste management (continued)	See <a href="#">Management – Conversion Process Water Use</a> on recycling used water at aspect/issue 1.5 Water availability and quality.	for other value added uses.	
<b>2. SOCIO-ECONOMIC</b>			
2.1 Land tenure/access and displacement	<p>Must Haves: Project must meet all conditions in this section</p> <ul style="list-style-type: none"> <li>Land Tenure</li> </ul> <p>[Also relevant to aspect(s)/issue(s): <a href="#">3.2 Participation and transparency.</a>]</p>	The land tenure has not been contested and there is evidence of a transparent negotiation and fair compensation, or secure legal title exists, or local communities have been informed and are aware of intended land use, or land ownership is clear. The project has not been disputed by local stakeholders.	Yes/No
2.4 Employment, wages and labor conditions  <a href="#">Back to table of contents</a>	<p>Must Haves: Project must meet all conditions in this section</p> <ul style="list-style-type: none"> <li>Labor Rights</li> </ul> <p>[Also relevant to aspect(s)/issue(s): <a href="#">3.1 Compliance.</a>]</p>	Management is aware of and complies with local labor legislation and the Universal Declaration of Human Rights. It actively manages its labor issues (child labor, forced or bonded labor, freedom of association, discrimination, minimum wage, use of contractors to avoid social benefits) and actively monitors compliance in its operations.	Yes/No
	<p>Key Social and Labour Issues</p> <ul style="list-style-type: none"> <li>Labor Availability</li> </ul>	The crop labor requirements have pronounced seasonality variations and labor is only required for a short period. To fulfill these requirements, workers must be relocated to the region.	0
		The crop labor requirements experience minor seasonal variations and labor is needed throughout the year. To fulfill these requirements, workers must be relocated to the region.	1
		The crop labor requirements has pronounced seasonal variations and labor is only required for a short period. All labor needs are available locally.	2
		The crop labor requirements experience minor seasonality variations and labor requirements are needed throughout the year. All labor needs are available locally.	3
	<p>Key Social and Labour Issues</p> <ul style="list-style-type: none"> <li>Worker Health and Safety</li> </ul>	There is no management system for health and safety issues. There is no evidence of worker training on health and safety issues, including but not	0

BIOFUELS ENVIRONMENTAL SUSTAINABILITY SCORECARD			
ASPECTS/ISSUES	COMPONENT	OPTIONS	SCORES
2.4 Employment, wages and labor conditions (continued)	[Also relevant to aspect(s)/issue(s): <a href="#">2.5</a> Human health and safety.]	limited to safe use and handling of pesticides, operating machinery, and using farm implements.	
		There is no management system for health and safety issues. There is some evidence of worker training on health and safety issues, including but not limited to safe use and handling of pesticides, operating machinery, and using farm implements.	1
		There is a management system for health and safety issues, but has not been effectively implemented. There is some evidence of worker training on health and safety issues, including but not limited to safe use and handling of pesticides, operating machinery, and using farm implements.	2
		There is a management system for health and safety issues, and this issue is actively managed and monitored. There is evidence of worker training on health and safety issues, including but not limited to safe use and handling of pesticides, operating machinery, and using farm implements.	3
2.5 Human health and safety	See <a href="#">Key Social &amp; Labour Issues – Worker Health and Safety</a> at aspect/issue 2.4 Employment, wages and labor conditions.		
2.7 Good management practices and continuous improvement  <a href="#">Back to table of contents</a>	Site and Crop Design: Those attributes that site design can influence  • Marginal Lands – Soils Suitability  [Also relevant to aspect(s)/issue(s): <a href="#">1.3</a> Productive capacity of land.]	A <b>soils assessment</b> has not been made by a qualified soils expert.	0
		A soils assessment has been made by a qualified soils expert and the soils were found to be good to excellent for agricultural purposes.	1
		A soils assessment has been made by a qualified soils expert and the soils were found to be satisfactory for agricultural purposes, but adequate for the biofuels crop.	2
		A soils assessment has been made by a qualified soils expert and the soils were found to be marginal for agricultural purposes, but adequate for the biofuels crop.	3
	Management: Those attributes that management can influence  • Performance Metrics – (see	Management has not developed any <b>metrics to measure performance around key sustainability indicators</b>	0
	Management has partially developed metrics, but these are not complete,	1	

BIOFUELS ENVIRONMENTAL SUSTAINABILITY SCORECARD			
ASPECTS/ISSUES	COMPONENT	OPTIONS	SCORES
2.7 Good management practices and continuous improvement (continued)	narrative for recommended metrics)	nor have they been implemented	
		Management has developed the metrics, and they have been partially implemented. No evidence of management follow-up or continuous improvement regarding results	2
		Management has developed metrics around key sustainability indicators and routinely measures performance and has continuous follow-up	3
<b>3. GOVERNANCE</b>			
3.1 Compliance	Must Haves: Project must meet all conditions in this section <ul style="list-style-type: none"> <li>• Legal Compliance</li> </ul>	Does the project comply with National and local laws, including land use plans?	Yes/No
	See <a href="#">Must Haves – Labourt Rights</a> on compliance with local legislation and the Universal Declaration of Human Rights at aspect/issue 2.4 Employment, wages and labor conditions.		
3.2 Participation and transparency	See <a href="#">Must Haves – Land Tenure</a> on an <b>informed and aware local community</b> of intended land use at aspect/issue 2.1 Land tenure/access and displacement.		
<b>4. FOOD SECURITY</b>			
4.1 Food availability  <a href="#">Back to table of contents</a>	Must Haves: Project must meet all conditions in this section <ul style="list-style-type: none"> <li>• Food Displacement</li> </ul> [Also relevant to aspect(s)/issue(s): <a href="#">4.2 Food access.</a> ]	An assessment has been made, which showed that the establishment of this crop will not displace local food crop land, nor have any impact on local or regional food availability or food prices.	Yes/No
	Site and Crop Design: Those	Current economic or social activity on these lands is intensive and important for <b>local food production.</b>	0

BIOFUELS ENVIRONMENTAL SUSTAINABILITY SCORECARD			
ASPECTS/ISSUES	COMPONENT	OPTIONS	SCORES
4.1 Food availability (continued)	attributes that site design can influence <ul style="list-style-type: none"> <li>• Marginal Lands – Current Land Use</li> </ul>	Current economic or social activity on these lands is occurring and its conversion to a biofuel crop would impact local food production.	1
		Current economic or social activity on these lands is minimal, primarily limited to extensive or gathering production schemes, with little impact to local food production.	2
		Current economic or social activity on these lands is nonexistent. There is no impact on local food production.	3
4.2 Food access  <a href="#">Back to table of contents</a>	Must Haves: Project must meet all conditions in this section <ul style="list-style-type: none"> <li>• Food Displacement</li> </ul>	See <a href="#">Must Haves – Food Displacement</a> on the impact of the establishment of the crop on local or regional food prices at aspect/issue 4.1 Food availability.	