



Introduction and Methodology

Sugarcane ethanol has been considered one of the best options for partial substitution of fossil fuels. However sustainability of Brazilian ethanol production has been questioned by the international market, so in addition to the current mandatory requirements, as Environmental Impact Assessment (EIA), new voluntary tools emerged to attend this demand.

Among the new tools, Bonsucro Certification is being widely adopted, and it aims at reducing environmental and social impacts of sugarcane producing through development of performance standards for environmental management.

As Bonsucro Certification and EIA have very similar objectives we establish as the research question: To what extent the requirements of EIA and Bonsucro Certification are overlapping for the sugarcane industry?

The main objective of this research is to propose guidelines to promote a closer relationship between the Bonsucro Certification and Environmental Impact Studies applied to the sugarcane industry.

A closer relationship between these environmental management tools can consider that future EIAs industry include aspects related to environmental certification in sugarcane production chain, encouraging the adoption of certification itself, very important for the Brazilian sugarcane industry, and contribute to greater reflection on the EIA process, clarifying points to be improved.

The methodology used qualitative, exploratory-descriptive, through a Case Study multi case. The data collection instrument used was a documentary source, focal interviews and semi-structured, analyzed the principles of Content Analysis.

The steps of the research are described in Figure 1.

The research method comprised the categorization of 22 criteria of Bonsucro certification in association with environmental impacts described in each 12 Environmental Impact Statement (EIS).

1. Literature review:

- Environmental Impact Assessment;
- Bonsucro certification;



2. Case analysis:

- Document analysis: Environmental Impact Assessment of 12 plants of ethanol; Bonsucro Production Standard - Version 3.0 March 2011, Including US Bonsucro Production Standard, Bonsucro Certification Protocol (Audit Guide) - Version 4.1 September 2011, including Bonsucro Certification Protocol of the European Union (EU) and Mass Balance and Chain custody - Version 3.0 March 2011 Including Chain of Custody Standard for Bonsucro the Mass Balance US;
- Association between Bonsucro certification impacts and impacts of 12 Environmental Impact Study;
- Interviews with representatives of Ethanol Plants.



3. Identify potential for rapprochement between the Environmental Impact Study and the Bonsucro Certification;
Propose guidelines to promote a closer relationship between the Bonsucro Certification and Environmental Impact Studies applied to the sugarcane industry.

Figure 1: Research Steps

Results and Discussion

The association between the impacts described in Bonsucro accreditation and the impacts described in the Environmental Impact Assessment of 12 ethanol plants are shown in Figure 2.

Figure 3 shows the graph of the sum total of the certification categories associated Bonsucro the 12 categories of the Environmental Impact Study.

The association between environmental management instruments showed that the points of greater dialogue in the EIA content compared to the principles of certification are facing land issues, water, biodiversity, ecological services and economic growth:

- Implement measures to mitigate the adverse impacts when identified;
- Continuously improve the status of soil and water resources;
- Reduce emissions and effluents and where feasible, promote the recycling of waste streams;
- Ensure engagement and transparent, consultative and participatory process with all relevant stakeholders;
- Promote economic sustainability;
- Assess the impact of cane sugar companies on biodiversity and ecosystem services.

The Bonsucro certification criteria that do not have any association with the EIA analyzed relate to socio-economic impacts, especially related to labor, production expertise and qualification of hand labor and monitoring the efficiency of production and process.

- Comply with the OIT conventions governing on child labor, forced labor, discrimination and freedom of association, and the right to bargain collectively;
- Apply human and labor rights of BSI to suppliers and contractors;
- Ensure a safe and healthy work environment in work operations;
- Pay at least the minimum wage to employees and workers (including migrant and seasonal workers, and other contract labor);
- Monitor the efficiency of production and process; measure the impacts of production and processing so that improvements are made over time;
- To promote effective and focused research, development and extension specialist;
- Train employees and other workers in all areas of their service, and develop their general skills.

Conclusion

In this respect, the survey view as an approximation of potential between the EIAs of the sugarcane industry and the Bonsucro certification increase and substantiate the approach to the social impacts on EIAs, especially impacts facing labor issues, in line with findings in the literature that emphasize the need for improving the integration of these impacts within the EIA process.

References

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IMPACTS OF 12 EIA	CRITERIA FOR CERTIFICATION BONSUCCRO																						
	PRINCIPLE 1			PRINCIPLE 2			PRINCIPLE 3			PRINCIPLE 4			PRINCIPLE 5										
	CR.1.1	CR.1.2	CR.2.1	CR.2.2	CR.2.3	CR.2.4	CR.2.5	CR.3.1	CR.3.2	CR.4.1	CR.4.2	CR.5.1	CR.5.2	CR.5.3	CR.5.4	CR.5.5	CR.5.6	CR.5.7	CR.5.8	CR.5.9	CR.6.1	CR.6.2	
IMP. EIA 01	8	8	0	0	0	0	0	0	0	3	0	0	2	0	0	1	0	2	3	0	0	4	
IMP. EIA 02	2	1	0	0	0	0	0	0	0	2	4	0	1	0	0	0	2	8	4	0	0	2	
IMP. EIA 03	1	1	0	0	0	0	0	0	0	1	7	0	5	0	0	4	0	2	1	1	0	2	
IMP. EIA 04	0	0	0	0	0	0	0	0	0	1	4	0	4	0	0	2	0	1	2	2	0	1	
IMP. EIA 05	0	0	0	0	0	0	0	0	1	2	1	0	4	0	0	4	0	2	2	1	1	5	
IMP. EIA 06	0	0	0	0	0	0	0	0	1	2	5	0	3	0	0	0	0	0	1	1	1	2	
IMP. EIA 07	0	0	0	0	0	0	0	0	0	3	6	0	0	0	1	1	0	0	1	2	0	3	
IMP. EIA 08	0	0	0	0	0	0	0	0	0	1	6	0	1	0	0	0	0	3	3	4	0	1	
IMP. EIA 09	0	0	0	0	1	0	0	0	0	8	0	3	0	0	0	0	2	5	3	0	0	0	
IMP. EIA 10	0	0	0	0	0	0	0	0	0	7	2	2	4	0	0	3	0	1	4	4	1	1	
IMP. EIA 11	0	0	0	0	0	0	0	0	0	4	4	0	3	0	0	3	0	1	1	4	0	0	
IMP. EIA 12	0	0	0	0	0	0	0	0	0	1	3	0	7	0	0	7	0	5	2	2	0	1	
IMP. EIA 13	0	0	0	0	0	0	0	0	0	5	2	0	5	0	0	4	0	2	1	1	0	5	
IMP. EIA 14	0	0	0	0	0	0	0	0	0	5	3	0	3	0	0	2	0	2	1	2	0	2	
IMP. EIA 15	0	0	0	0	1	0	0	0	0	5	3	0	3	0	0	2	0	1	1	2	0	6	
IMP. EIA 16	0	0	0	0	0	0	0	0	1	3	1	0	6	0	0	3	0	0	1	1	1	3	
IMP. EIA 17	0	0	0	0	0	0	0	0	0	2	4	0	5	0	0	4	0	1	1	1	0	2	
IMP. EIA 18	0	0	0	0	1	0	0	0	1	3	4	0	4	0	0	4	0	1	1	1	1	2	
IMP. EIA 19	0	0	0	0	0	0	0	0	0	3	2	0	4	0	0	5	0	1	1	1	3	2	
IMP. EIA 20	0	0	0	0	2	0	0	0	0	4	3	0	4	0	0	4	0	2	2	2	0	2	
IMP. EIA 21	0	0	0	0	1	0	0	0	1	4	1	0	4	0	0	6	0	1	1	1	1	4	
IMP. EIA 22	0	0	0	0	2	0	0	0	1	3	1	0	6	0	0	3	0	0	1	1	1	3	
IMP. EIA 23	1	1	0	0	0	0	0	0	1	5	13	0	15	0	0	7	0	1	2	4	1	5	
IMP. EIA 24	0	0	0	0	1	0	0	0	2	5	5	0	10	0	1	9	0	9	9	9	2	5	
IMP. EIA 25	0	0	0	0	1	0	0	0	0	0	5	1	0	0	0	1	0	2	5	7	0	0	
IMP. EIA 26	0	0	0	0	2	0	0	0	0	0	6	0	0	0	0	0	2	2	2	2	0	0	
IMP. EIA 27	0	0	0	0	1	0	0	0	0	0	9	0	0	0	0	0	4	3	2	0	0		
IMP. EIA 28	2	1	0	0	1	0	0	0	4	6	13	0	12	0	1	10	0	1	3	3	4	4	
IMP. EIA 29	1	1	0	0	1	0	0	0	2	2	14	0	8	0	1	11	0	4	12	7	1	3	
IMP. EIA 30	0	0	0	0	0	0	0	0	3	0	1	0	2	0	2	5	0	1	1	0	3	0	
IMP. EIA 31	0	0	0	0	0	0	0	0	2	0	3	0	3	0	2	3	0	0	2	1	2	0	
IMP. EIA 32	0	0	0	0	0	0	0	0	3	1	3	0	0	0	2	1	0	0	1	0	0	3	0
IMP. EIA 33	2	2	0	0	3	0	0	0	5	10	24	1	9	0	3	12	0	2	12	10	5	10	
IMP. EIA 34	0	0	0	0	0	0	0	0	3	0	3	0	0	0	2	1	0	1	0	2	3	0	
IMP. EIA 35	2	2	0	0	2	0	0	0	6	12	23	3	22	0	6	20	0	2	10	15	6	8	
IMP. EIA 36	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	1	0	0	
IMP. EIA 37	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	2	3	0	0	0	
IMP. EIA 38	2	2	0	0	2	0	0	0	5	8	32	0	19	0	1	19	0	21	16	17	5	8	
Total	21	19	0	0	23	0	0	0	42	105	240	7	179	0	22	158	0	86	126	123	44	93	

Figure 2: Association between the impacts of the 12 Impact Assessment and the Bonsucro certification. Source: Prepared

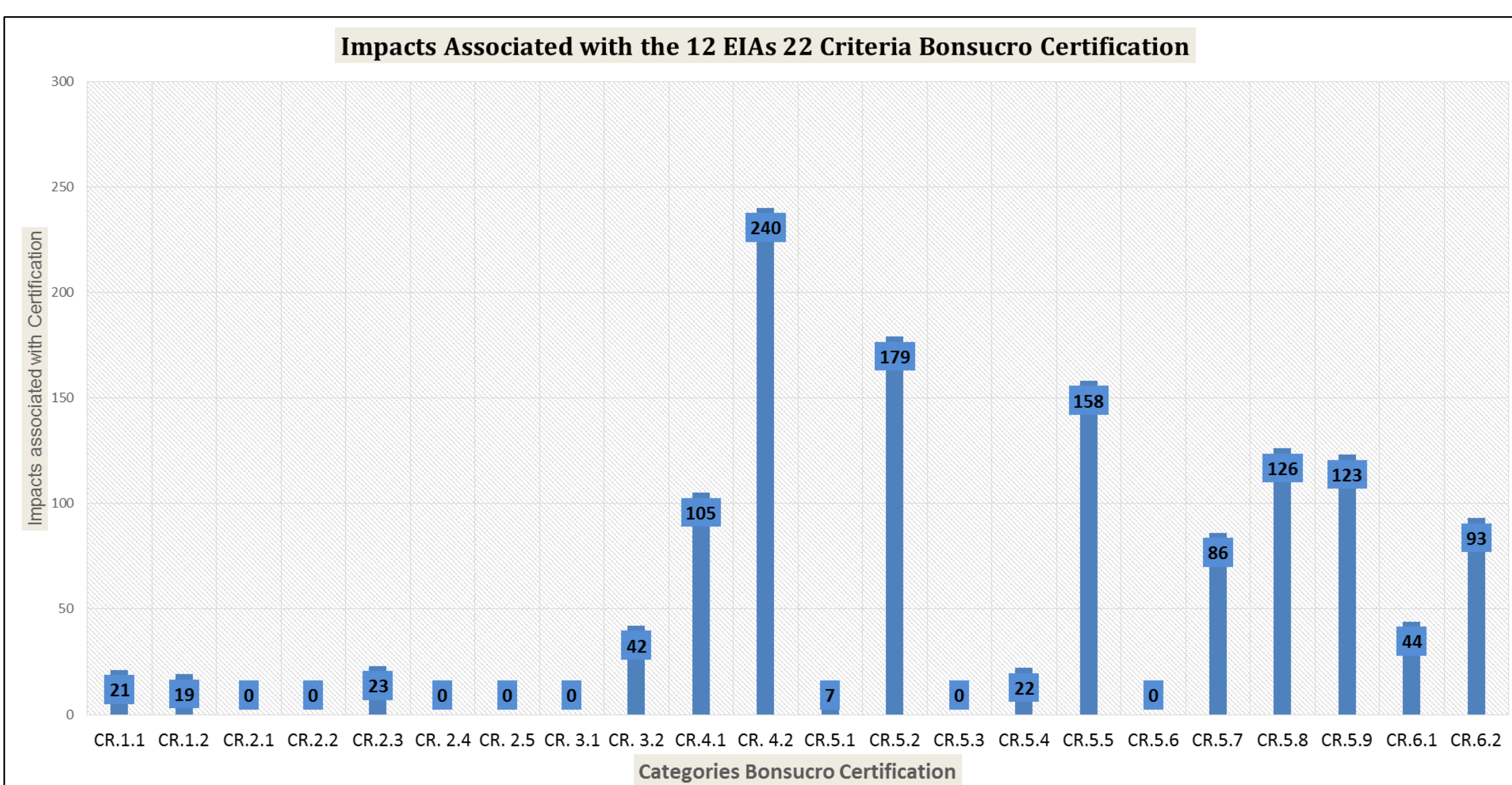


Figura 3: Impacts Associated with the 12 EIAs 22 Criteria Bonsucro Certification