

Organic versus Conventional Bananas: Comparison of economic performances and carbon footprint

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Key questions

- Do organic bananas have a lower carbon footprint?
- Which practices lower the carbon footprint?
- Do certification and labelling allow for higher prices?
- How to assess which type of banana is better performing in economic terms ?



How to answer these questions: FAO analysis tools

Cost -
Benefit
Analysis of
value
chains:
**FAO VCA-
Tool**

- Structures the accounting framework of a value chain (per agent)
- Computes the inflows and outflows per agent along the entire chain
- Provides performance, competitiveness and equity indicators

carbon
footprint
analysis:
**Ex-ACT
Carbon-
balance
Tool**

- Assesses the carbon footprint along the entire value chain
- Detects changes in practices that would reduce the carbon footprint

Presenting the case study

we compare the economic performance and the carbon footprint of two different types of banana production

Conventional production

Big company
plantation

Organic production

Medium
farmers

Based on Ecuador and Costa Rica value chains data

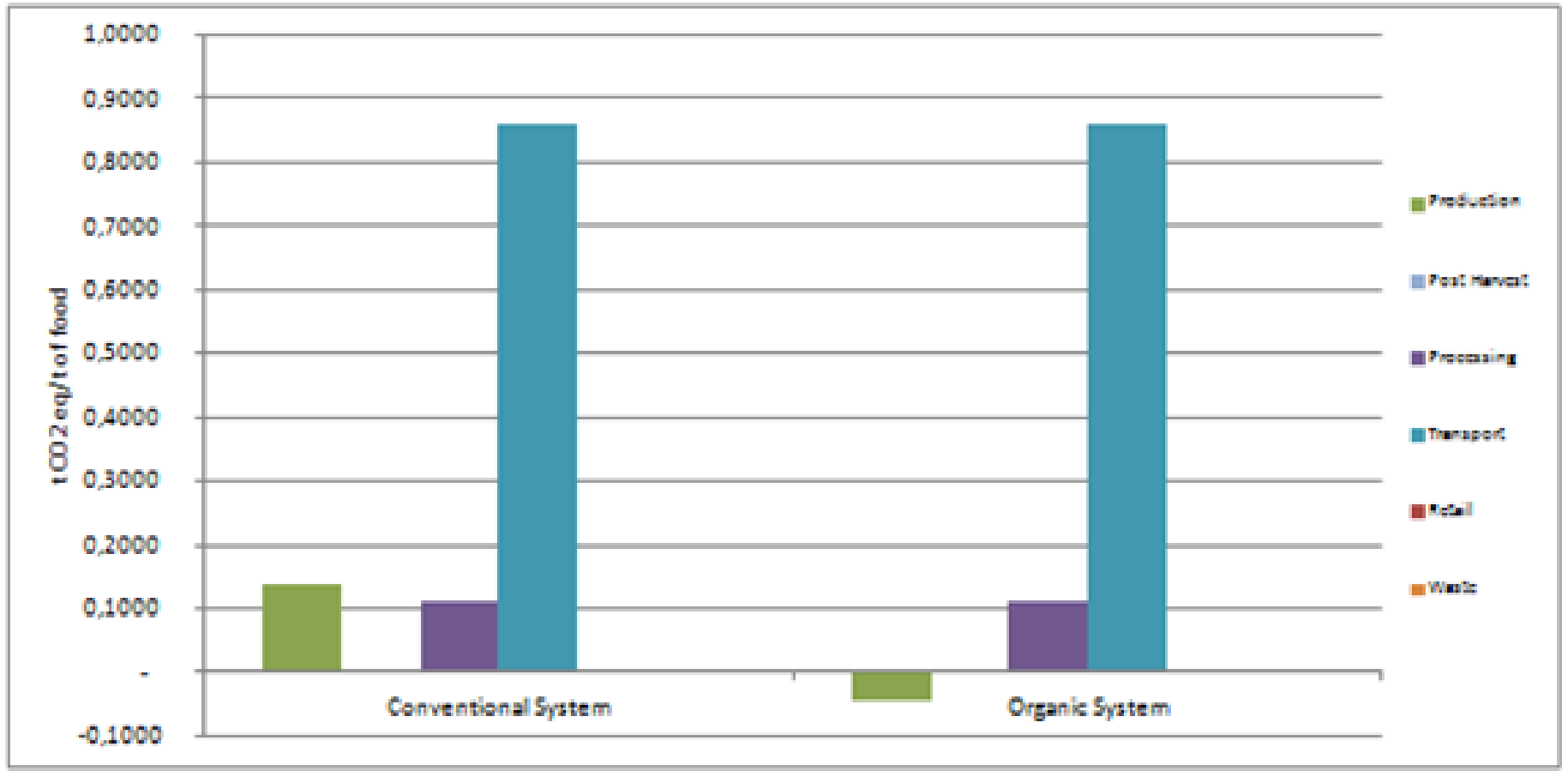


Necessary data for the analysis (with VCA-Tool and EX-Act)

- Production factors (labour, capital, land)
- Yields of organic and conventional production practices
- Physical quantities of inputs used along the entire value chain (fuel, materials, etc.)
- Prices of inputs, outputs and factors
- “*Reference prices*” of carbon emissions/sequestrations and health costs related to the use of pesticides (estimated)



EX-ACT results



Technologies: Inputs-Outputs/Ha under different scenarios

Creating the activities

In/Output quantities
 Print Form ShowComponent CopyToExcel Help

Activity: banana production

Quantities

Select aggregates
Show aggregates

ds	Unit	Base scenario	1	2	3	4
INPUTS						
cleaning Lab	man/day	26.0	40.0	0.0	0.0	
deleafing Lab	man/day	8.7	9.0	0.0	0.0	
desuckering Lab	man/day	10.4	10.4	0.0	0.0	
Weeding Lab	man/day	0.0	10.0	0.0	0.0	
propping Lab	man/day	8.7	8.7	0.0	0.0	
fertilizing Lab	man/day	21.7	24.0	0.0	0.0	
Irrigating Lab	man/day	17.3	17.3	0.0	0.0	
PestControl Lab	man/day	8.7	14.0	0.0	0.0	
Bagging Lab	man/day	17.3	17.3	0.0	0.0	
herbicide	liter	6.7	0.0	0.0	0.0	
bag (treated)	bags	175.0	175.0	0.0	0.0	
propping material	ha	1.0	1.0	0.0	0.0	
Urea-Fert	bag(50Kg)	7.6	0.0	0.0	0.0	
lime-Fert	bag(50Kg)	3.2	0.0	0.0	0.0	
organic fertilizer	bag(50Kg)	0.0	3.1	0.0	0.0	
pesticides	cicles	1.2	0.0	0.0	0.0	
fuel x irrigation	gallons	16.5	16.5	0.0	0.0	
depr irrig syst	moneatry unit	66.7	66.7	0.0	0.0	
depr funicular	monetary unit	8.3	8.3	0.0	0.0	
depr machineries	monetary unit	66.7	66.7	0.0	0.0	
organic certification	kg	0.0	37,977.7	0.0	0.0	
carbon emission	ton	6.3	0.0	0.0	0.0	
Packing material	Box	2,523.0	2,093.0	0.0	0.0	
Health cost	moneatry unit	108.0	0.0	0.0	0.0	
Manager Lab	Man/day	1.3	1.3	0.0	0.0	
Land rent	monetary unit	200.0	200.0	0.0	0.0	
Interests on capital	monetary unit	300.0	300.0	0.0	0.0	
OUTPUTS						
bananas	kg	45,780.0	37,977.7	0.0	0.0	
carbon sequestration	ton	0.0	1.6	0.0	0.0	

We are building two scenarios using the VCA-Tool; the first one is the “Base scenario”, the conventional one; the second one is “scenario 1” that represents the organic production.

The two different productions have different yields and different technologies (in terms of labour, fertilizers, etc.). Moreover, the conventional production generates carbon emissions and health costs, while the organic one sequestrates carbon.



Cost/Benefit Analysis at market and reference prices

After creating the two scenarios is possible to compare them and determine the differences in terms of costs and benefits. In this analysis market prices of carbon emissions and health costs are zero, as private agents do not pay for them (they are costs only in a social perspective).

At **market prices** profits in the organic production are higher due to:

- higher prices of the outputs
- No costs for chemicals

-NB: Value added is even higher due to more labour intensive process

At “**reference prices**” profits are even higher, due to:

- zero carbon emissions (even slight sequestration)
- no health costs

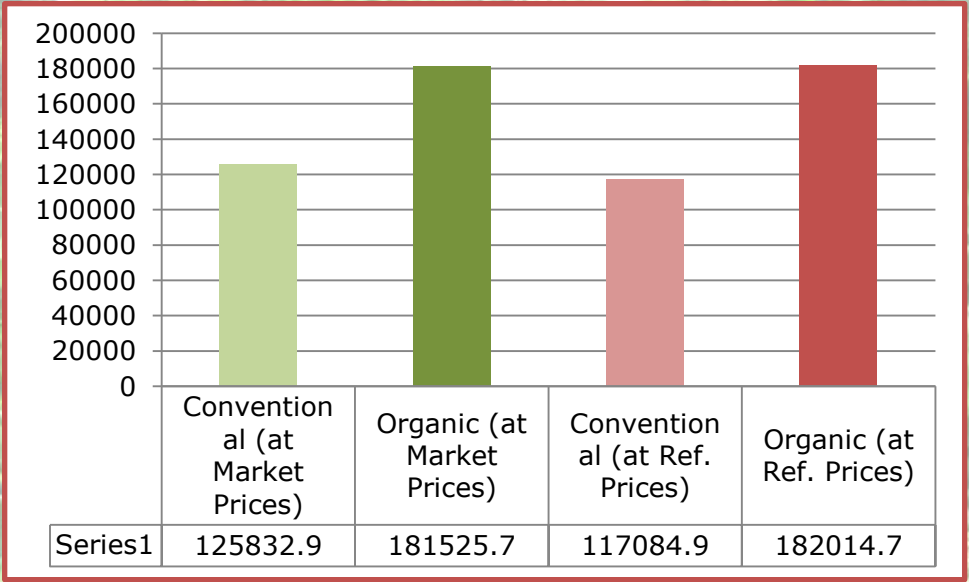
The reference price of the carbon emission (or sequestration) is 5 \$/T.



Answers

	Conventional Farm	Organic Farm	Difference in profits/losses (for organic farm)
Profits/Losses at market prices	125,833	181,526	+44.3 %
Profits/Losses at reference prices	117,085	182,015	+55.5 %
Difference between market and reference prices	-8,748	489	

Differences due to the costs of the emission/sequestration of carbon (for 60 ha banana farming unit) and the health costs.



Conclusion remarks

Results with limited data:

- Organic production decreases the carbon footprint, though transportation stays the most central issue
- Organic production is more profitable both from a social and private perspective
- FAO VCA-Tool and EX-ACT allow for further analysis in different situations...
- FAO is ready to assist to carry out further analysis ..including equity concerns in value added distribution across agents and countries....



References

The VCA-Tool can be downloaded at:

<http://www.fao.org/easypol>

The Ex-Act tool can be downloaded at:

<http://www.fao.org/tc/exact>



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