Integrating agroforestry intercropping systems in intensive agricultural landscapes:
a SWOT-AHP analysis of stakeholders’ perceptions

G. Laroche, N. Gélinas, M. Doyon & A. Olivier

Presented by:

Alain Olivier

Université Laval, Québec, Canada
Context

- Agroforestry intercropping systems
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- Agroforestry intercropping systems

- Intensive agricultural landscapes
  - Tree cover decline
  - Water and soil quality depletion
  - Biodiversity loss
  - Vulnerability to climate change impacts
Context

- Agroforestry intercropping systems
- Intensive agricultural landscapes
- Landscape trajectories (Ruiz and Domon 2009)
  
  Biophysical factors
  
  Social factors
Objectives

1) identify **local stakeholders’ perceptions** of the driving forces influencing agroforestry intercropping systems implementation;

2) assess the **potential of 3 agroforestry intercropping system designs** according to these driving forces;

3) **compare the answers** across various categories of stakeholders;
Study area

LES MASKOUTAINS
St. Lawrence lowlands (fertile soils)
86 148 h.

1 310 km²
96 % dedicated to agriculture
1 060 farms
Corn and cereals, hog, milk
Methodology

Focus group

Farmers - Farm advisors - Forestry advisors - Urban planners - Local authorities

SWOT Matrix
Hierarchisation of SWOT Factors
Rating of 3 AGF designs

Saaty 2010.
What are the STRENGTHS, WEAKNESSES, OPPORTUNITIES and THREATS influencing the integration of intercropping systems in your area?

<table>
<thead>
<tr>
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<tbody>
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<td>a.</td>
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Weaknesses
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Opportunities
- a.
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Threats
- a.
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PAIRWISE COMPARISONS

Strength A is more important
A and B are equal
Strength B is more important

Saaty 2010.
Methodology

« Crop »
alternative

Focus on CROPS
Cereals
Wide rows
Timber, nuts
On cultivated plots

« Tree »
alternative

Focus on TREES
Forage / pasture
Narrow rows
Timber
On abandoned plots

« Landscape »
alternative

Focus on LANDSCAPE
Cereals or pasture
Wide rows
Fruits, nuts
On strategic sites
to enhance aesthetics
Methodology

Which design is best to maximize strengths and opportunities / minimize weaknesses and threats?

RELATIVE PRIORITY SCORE

Saaty 2010.
Results
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### SWOT FACTORS

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- **S_b**: Availability of human and organizational resources.
- **S_c**: Local interest in landscape aesthetics and provision of ecological services.

**Weaknesses**

- **W_a**: Intensive agricultural systems and habits.
- **W_b**: Negative perceptions on the role of trees on farms.
- **W_c**: Lack of knowledge on agroforestry intercropping systems.

**Opportunities**

- **O_a**: Research network and expertise.
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**Threats**

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Relative priority scores of the 3 intercropping alternatives

- **Crop alternative**
- **Tree alternative**
- **Landscape alternative**
Relative priority scores of the 3 alternatives according to stakeholders
Relative priority scores of the 3 alternatives according to stakeholders

Crop alternative  Tree alternative  Landscape alternative

All Stakeholders  Farmers  Farm Advisors  Forestry Advisors  Urban Planners  Local authorities
Discussion

• Numerous social factors limit intercropping systems integration
  (Place et al. 2012, Ruiz and Domon 2009)

• Trees are not seen as a « profitable » element of the system
  • Trees = conservation practices
  • Timber crisis and cultural habits

• Collective rating hides profound disagreements
  • Choices based on different factors
  • Stakeholders divided on the best suited alternative
Conclusion

In Les Maskoutains intensive agricultural landscape...
Conclusion

In Les Maskoutains intensive agricultural landscape...

• Social context limits intercropping system integration;

• Stakeholders prefer intercropping systems aiming at crop production or landscape aesthetics with widely spaced tree rows;

• Further studies should compare intercropping systems to other land-use...
Thank you!

References


Ruiz J, Domon G. 2009. Analysis of landscape pattern change trajectories within areas of intensive agricultural use: a study in a watershed of southern Québec, Canada. Landscape ecology, 24: 419-432.


Picture credits

Google Maps, Bertrand Anel, Alain Cogliastro, David Rivest, Courrier Sud.