Ex ante evaluation of several scenarios of crop-livestock systems of Guadeloupe using IMPACT®

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Introduction: background and purpose of the study:

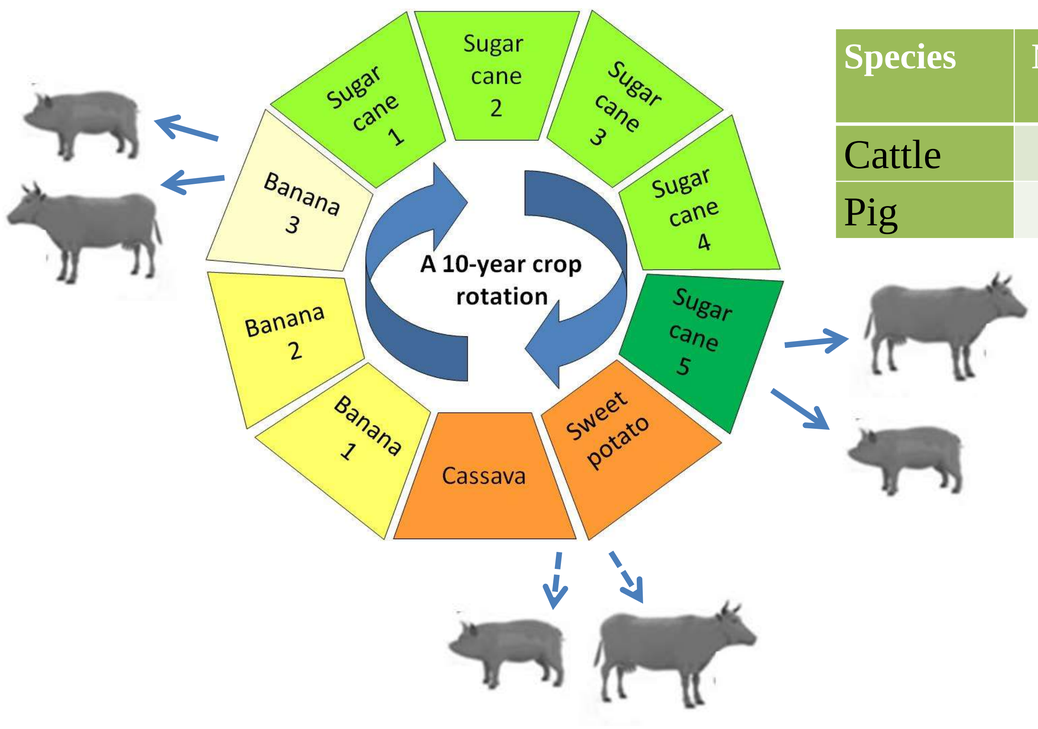
➔ Around 80% of farm in Guadeloupe are integrated crop livestock systems (ICLS).
➔ Due to their number they contribute to a high proportion of the local food.
➔ They are theoretically more sustainable than conventional systems mainly due to the curling of nutrient cycles related to crop livestock integration.
➔ Little information are available on the real potential of ICLS to increase sustainability.

⇨ Five scenarios more or less integrated have been ex ante evaluated using IMPACT® (Herrero et al., 2007).

Material and methods:

Scenario 1 (S1): 5 ha

Cropping system



Livestock system

Species	N /year	Expected ADG
Cattle	5	500 g/d
Pig	30	500 g/d

Legume intercropped in banana production

Other scenarios

Scenario	Characteristics
S2a	S1 + legumes used as green manure
S2b	S1 + legumes used for animal feeding
S3a	Same animal number than S1 with external feed
S3b	Same surface than S1 with only animal productions (22 Creole bulls and 30 Creole pig)

→ Whole production used for animal feeding

⇢ Part of production and by-products used for animal feeding

Results and discussion

➢ *To an environmental point of view, integrated systems are more environmentally friendly than specialized ones. Indeed, S1, S2a and S2b)required on average 85% less chemical inputs (phytosanitary products and fertilizers) and have a 6 times higher nitrogen balance than specialized ones (S3a and S3b).*

➢ *To a social point of view integrated systems (S3a and S3b) required on average 74% less work time than specialized ones (S1, S2a, and S2b,), mainly due to time needed to harvest and process crop residues to feed animals.*

➢ *Animal systems (S3a and S3b) were economically more interesting than integrated systems (S1, S2a, and S2b) mainly due to the cost of labor.*

⇨ *Innovation have to be produced in integrated systems to decrease the high need for labor linked to animal feeding.*

References:

Herrero, M. et al., 2007. IMPACT: Generic household-level databases and diagnostics tools for integrated crop-livestock systems analysis. Agricultural Systems , 92: 240–265.

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