



Environmental impacts on the Galapagos Islands: Identification of interactions, perceptions, and steps forward

Authors: *Francisco Benítez-Capistrós, Jean Hugé and Nico Koedam*

Objectives

- To propose a detailed methodological approach that focuses on mitigation strategies for environmental impacts on the Galapagos Islands, Ecuador
- To identify and characterize environmental impacts associated with anthropogenic activities, typically addressed in environmental impact assessment (EIA), in the particular context of the Galapagos Islands.
- To investigate whether crucial environmental information is lacking, how impacts interact with each other and how multiple stakeholders in Galapagos perceive these impacts and what solutions they have to offer to further guide and facilitate a better sustainability and protection of the archipelago.

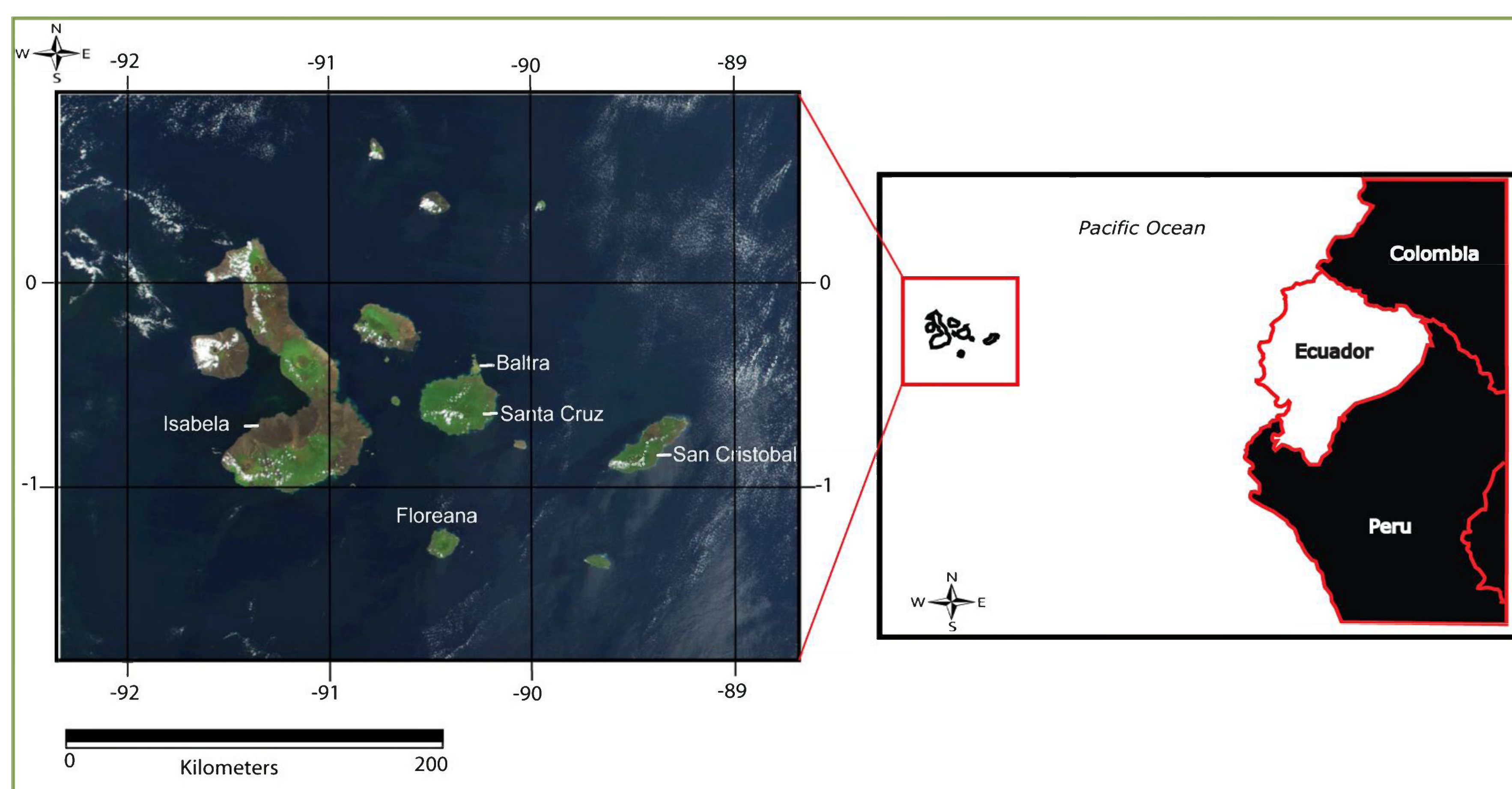
Methods

- The present research proposes a participatory approach to understand the perception of environmental impacts and to develop responsive impact mitigation strategies in the Galapagos Islands.
- The Drivers – Pressures – State – Impact – Responses (DPSIR) framework provided an analytical lens, while the Delphi approach was chosen to involve selected Galapagos experts in the indicator selection process.
- The Delphi consists of an iterative set of questionnaires, interspersed with feedback from earlier response and organized in two or more rounds.

Results

- After the first round of open questions of the Delphi, 55 indicators and 28 interactions of environmental impacts were determined in total and represented the causal chain of events of the DPSIR framework.
- Finally after the third round of the Delphi, final consensus was reached for 37 out of the 55 indicators (Figure 1), ($q \geq 3.5$ and $Q \leq 0.5$); whereas 7 out of 28 interactions of environmental impacts (Figure 2) were selected as the most important ones (Mean ≤ 0.5 and $CV \leq 0.5$).

- The Galapagos Islands and mainland Ecuador.** Left: Galapagos satellite image (Nasa 2002). Right: Ecuador mainland map (Source: own research)



Discussion and Conclusions

- The final indicator set (DPSIR), will benefit from further discussions and new ideas to ensure that environmental impacts and anthropogenic related activities are correctly weighted in the context of sustainability for proper conservation of the Islands.
- Findings of this study highlight the potential of the Delphi approach to develop locally supported and context-specific indicators that will allow Galapagos decision makers to deliver policies that properly address environmental impacts, in order to move towards sustainability and towards proper conservation management.

Figure 1. The DPSIR framework for the Galapagos Islands.

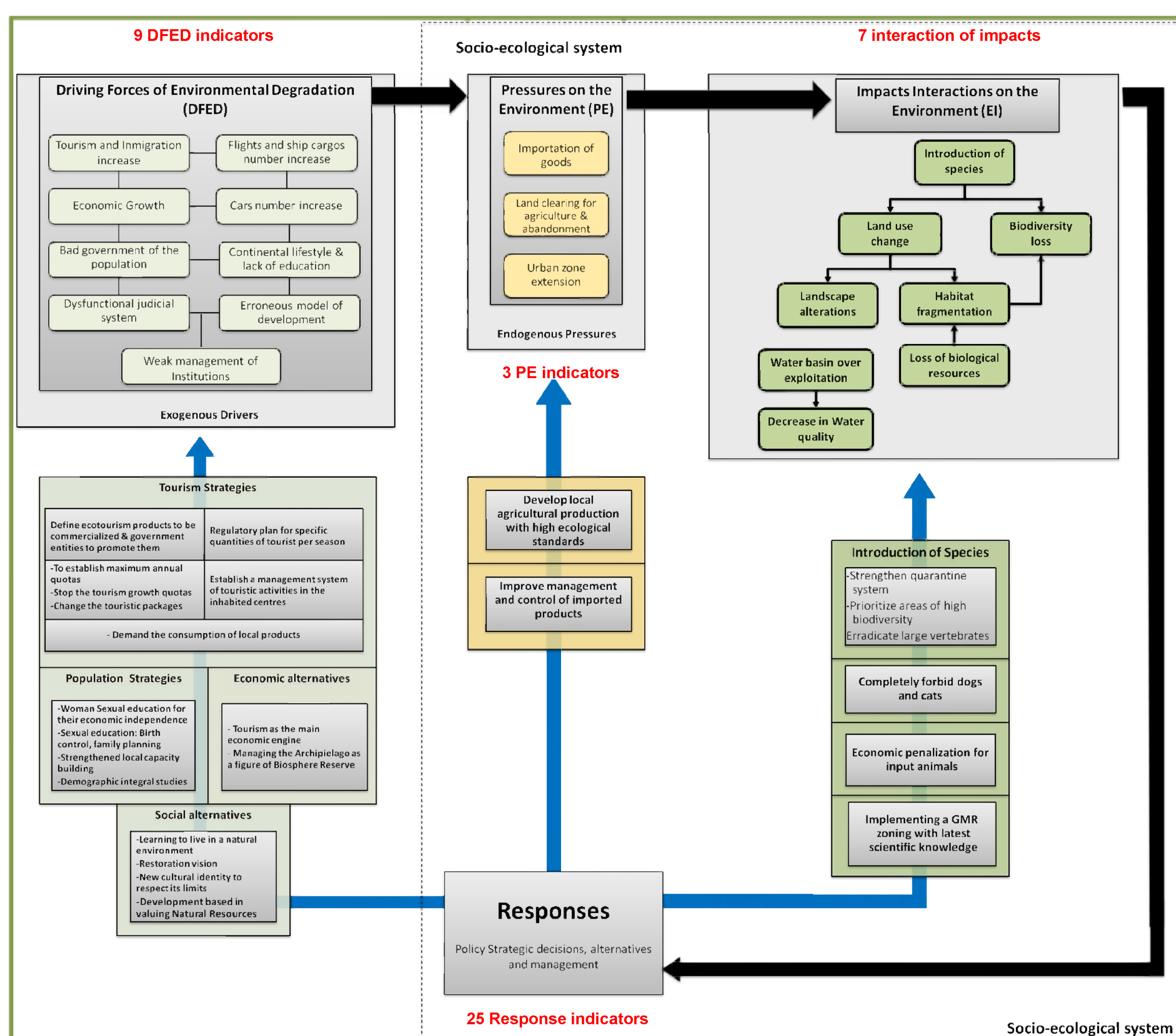


Figure1 description: The black arrows represent the casual and systemic chains of event between the different levels of the DPSIR framework. Thus, DFED causes PE, PE causes EI, and EI generates Responses. The Blue arrow represents the different identified responses that have to be implemented to systematically mitigate DFED, PE and EI.

Figure 2 . 7 interactions of impacts

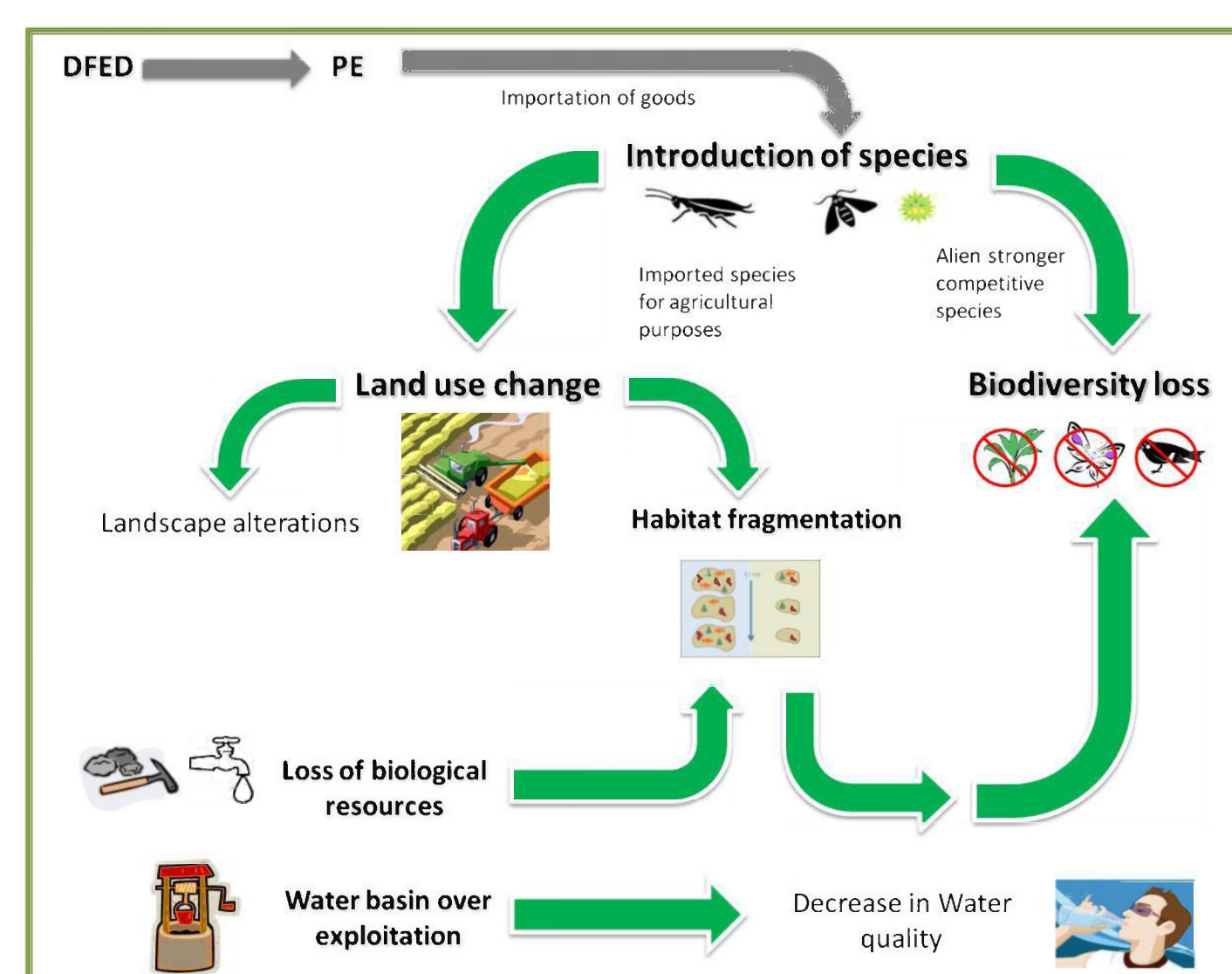


Figure 2 description: Proposed interaction of impacts for Galapagos. The arrows represent the flow of interactions of impacts obtained as selected by participants (i.e. introduction of species causing: Biodiversity loss with mean=0.66 and CV=0.12 and land use change with mean=0.51, CV=0.24).

Sponsors of the research

