Biodiversity information in sugarcane industry CEA

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CONTEXT

- Cumulative effects assessment (CEA): analyze cumulative environmental changes over time, focusing on valued environmental components, considering the proposed action and other past, present, and future developments

- **CEA requirements in Brazil**
  - Federal EIA legislation: requires consideration of CE in environmental impact studies (EIS)
  - São Paulo State: EIA regulation for sugarcane industry projects – *adequate assessment of cumulative effects* – due to the spatial concentration of monocultures and industrial plants in the state

- **Sugarcane industry projects insufficiently address cumulative effects**
  - (i) lack of technical and methodological guidelines
  - (ii) availability of reliable information about other projects

- Need of baseline information to be available and transferred over time to properly support project-based CEA

Aim: Analyze availability and adequacy of biodiversity information to assess potentially significant cumulative effects on biodiversity in the EIA of sugarcane industry projects in São Paulo State

METHODS

Step 1. Identification of a potentially significative cumulative effect on biodiversity of sugarcane crops

- Review of scientific literature on the direct/indirect impacts of sugarcane monoculture on biodiversity
- Adoption of a conceptual framework of cumulative environmental change to describe the potential cumulative effects on biodiversity of sugarcane crops
- Selection of a potential cumulative effect on biodiversity for discussion.

Step 2. Discussion of baseline information needed for the assessment of the potential cumulative effect selected

- Review of parameters that can influence the potential cumulative effect identified.
- Description of the key baseline information required for each parameter to be assessed.

Step 3. Analysis of availability and adequacy of the current biodiversity information to assess cumulative effects of sugarcane industry

- Content analysis of ToRs and EISs of sugarcane industry regarding:
  - i. explicit mention of the CEA on biodiversity
  - ii. inclusion of the key baseline information on biodiversity (Step 2).
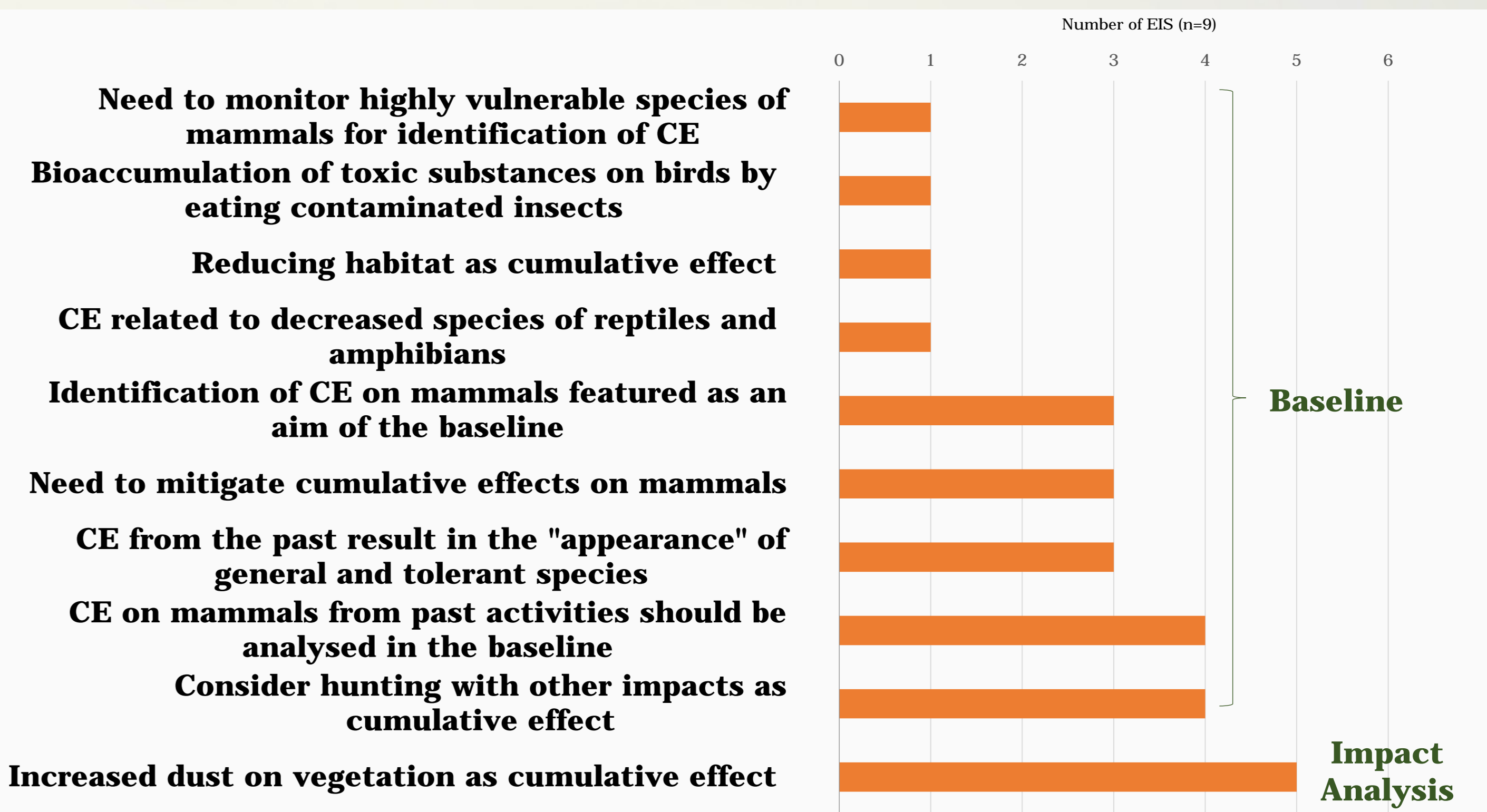

Figure 1. Synthesis of explicit mention to cumulative effects in EIS of sugarcane industry.

- 9 EISs consider the decrease or change in the permeability of the landscape matrix due to LUC
- 1 EIS describes the potential of increasing rodents abundance; 4 EIS mention the potential of reducing abundance and richness of bird species
- All EIS present: (i) maps or satellite image and quantification of the remaining forest fragments; (ii) description of past vegetation; (iii) brief description of historical dynamics of LU and past influences; (iv) use of GIS for mapping current LU and sugarcane areas
- Time series analysis is not used for the baseline and impact analysis.

RESULTS AND DISCUSSION

Source	Pathway	Cumulative effect
Land use change (LUC)	Additive process	Change in species diversity in forest fragments

Key baseline information to assess change in species diversity in forest fragments

- Past and current land cover characterization and mapping
- Analysis of landscape structure – shape, size, types, composition, number of remaining fragments, permeability of landscape matrix
- Temporal analysis (data from past activities and habitat conditions)
- Use of GIS, satellite images, indices, indicators, and modelling for collecting and analysis.

Analysis of biodiversity information in 27 EIAs

- ToRs do not explicit the requirement for CEA on biodiversity
- 14 ToRs call for considering the impacts on fauna communities due to the land use change
- 9 EISs briefly mention potential cumulative effects on biodiversity (Figure 1)

CONCLUSIONS

For supporting CEA on biodiversity in EIA of sugarcane industry, it is necessary to:

(i) ToR focus on specific questions regarding cumulative effects on biodiversity, such as defining key information needs to assess the change in species diversity;

(ii) Prepare guidance featuring general procedure, tools and techniques to drive CEA

(iii) The Environmental Agency should adopt initiatives to manage biodiversity data and information generated in the EIA process, in order to facilitate their use in future EIA

(iv) Reinstatement of landscape ecology studies as a requirement in all EIS.