Integrating Socioecological System Approach in Cumulative Impact Assessment



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How to integrate the <u>socioecological relations</u>? Who are the key <u>receptors</u>?

What are the <u>key stressors</u>?

How to establish the <u>appropriate methods</u> to CIA? How to include the interactions among the socioecological impacts? How to incorporate the <u>complexities</u> of the system?

How to deal with not foreseen impacts? -----> Adaptive management

Amazonian socioecological system

Madeira River Basin Bio-culturally diverse biome River-dependent communities

Diverse stressors e.g., dams in cascade, deforestation + climate change

+ natural events

<u>Cumulative</u> and <u>socioecological</u> impacts are overlooked



How to conduct a CIA in these contexts?

(Athayde et al., 2019)

How to co



Cumulative impact assessment

How to integrate the socioecological relations? Who are the key receptors? -----> VC

What are the key stressors?

ntroduction

How to establish the appropriate methods to CIA? How to include the interactions among the socioecological impacts? How to incorporate the complexities of the system?

How to deal with not foreseen impacts? -----> Adaptive management

Framework proposed

Discussion

and

Results



socioecological sytem over time

Framework

Adaptive cycle of the socioecological system

Potential: available processes or resources that can facilitate the adaptation of a system when facing changes

> **Connectedness**: relationships between elements and processes of a system and the degree of influence from external variables

> > **Resilience**: ability of a system to absorb shocks without shifting the regime



Conexão

(Holling and Gunderson, 2002; Sundstrom and Allen, 2019)

Cumulative impact assessment

How to integrate the socioecological relations? Who are the key receptors? -----> VC

What are the key stressors? How to establish the appropriate methods to CIA? How to include the interactions among the socioecological impacts? How to incorporate the complexities of the system?

How to deal with not foreseen impacts? -----> Adaptive management

Considerations

INCREASING IMPACT ON THE DECISION

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
LUBLIC FANIICIFATION GUAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

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Co-creating research agenda/scope, identification, and assessment of impacts
Thinking about adaptive management

- Scenario before dams

International Association for Public Participation

Multiple methods

- interviews
- participatory workshops ——
- remote sensing and GIS
- hydrological analyses

- Identification of the socioecological interactions and impacts

- Knowledge co-creation
- Data interpretation

Importance of participatory mapping and TEK in understanding socioecological impacts

(Cumming e Seppelt, 2022)

System thinking

network analysis that represents the system's structure and feedback
indicate changes and adaptations



(Haraldsson, 2004)



(Haraldsson, 2004)



Como é a agricultura de praia e várzea?

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A agricultura de várzea é desempenhada por homens e mulheres da família. Na época da colheita, se necessário, há a contratação de mão-de-obra pelo

Você sabia? O destino das produções é para consumo (subsistência) das famílias e para a venda, principalmente para atravessadores (intermediários). Também há a venda direta em feiras e na própria comunidade, apesar de menos frequente. sistema de diárias, normalmente, de uma a três pessoas.

Antes do plantio, é preciso remover as gramíneas e outras

vegetações, como as embaúbas. Isso é feito um pouco antes do início das chuvas. Assim, quando as águas do rio baixam, o solo já estará pronto para o cultivo. Mesmo assim, algumas gramíneas crescem entre a fase de baixa do rio e o plantio, sendo necessário removê-las novamente.

Sazonalidades e relações socioecológicas



Biocultural memory



Remoção de canarana e embaúba na várzea

Na época das chuvas, os agricultores mudam suas atividades para as várzeas altas e terras firmes, onde cultivam banana, coco, cupuaçu, cacau, goiaba, caju, entre outros, e extraem castanha-do-pará, açaí e outros frutos.

Sazonalidades e relações socioecológicas

(Haraldsson, 2004)

Adaptive management – thinking together!



The adaptive cycle framework allowed us to analyze the changes and adaptations





Adaptive management: planning and management occur in a context of incomplete information

2-eyed-seeing perspective requires money and time

- involvement of multiple actors
- use of multiple tools
- knowldge co-creating
- adapting scope
- establishing relationships of trust with communities



(Richter et al., 2010; Shackleton et al., 2022)

Framework

Conexão

Understanding how socioecological systems change and adapt in the face of impacts, such as those promoted by development projects and climate change, is vital to ensuring the resilience of these systems



(Berkes et al., 2002; Biggs et al., 2012; Buschbacher et al., 2016)

- All the riverine people along the Madeira River who contributed directly and indirectly to this research
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- Committee: Dr. Cristina Adams, Dr. Marcelo Montaño, Dr. Evandro Moretto





Let's continue the conversation!

Message me your questions or comments in the IAIA25 app.

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