

# WHAT DOES SUSTAINABILITY MEAN ANYWAY?

## The bright and dark side of pineapple production in Costa Rica

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### INTRODUCTION

- **Sustainable development** is a dominant paradigm in the 21st century
- Definitions of sustainability significantly influence views on social and environmental issues and transformation measures
- Costa Rica reconciles intensive agriculture and its green image under the **desarrollo sostenible a la tica (DSAT)** paradigm, based on the Brundtland definition
- In DSAT, economic development often takes precedence over environmental protection
- Case study: Environmental and social impacts of national **intensive pineapple production** despite being marketed as sustainable (Del Monte, 2021)
- An alternative paradigm, **regenerative development (RD)**, emphasizes socio-cultural regeneration (Müller, 2017)
- A social-ecological systems perspective (Schlüter et al., 2019) is adopted to analyze interactions and feedback between social and ecological components in both paradigms

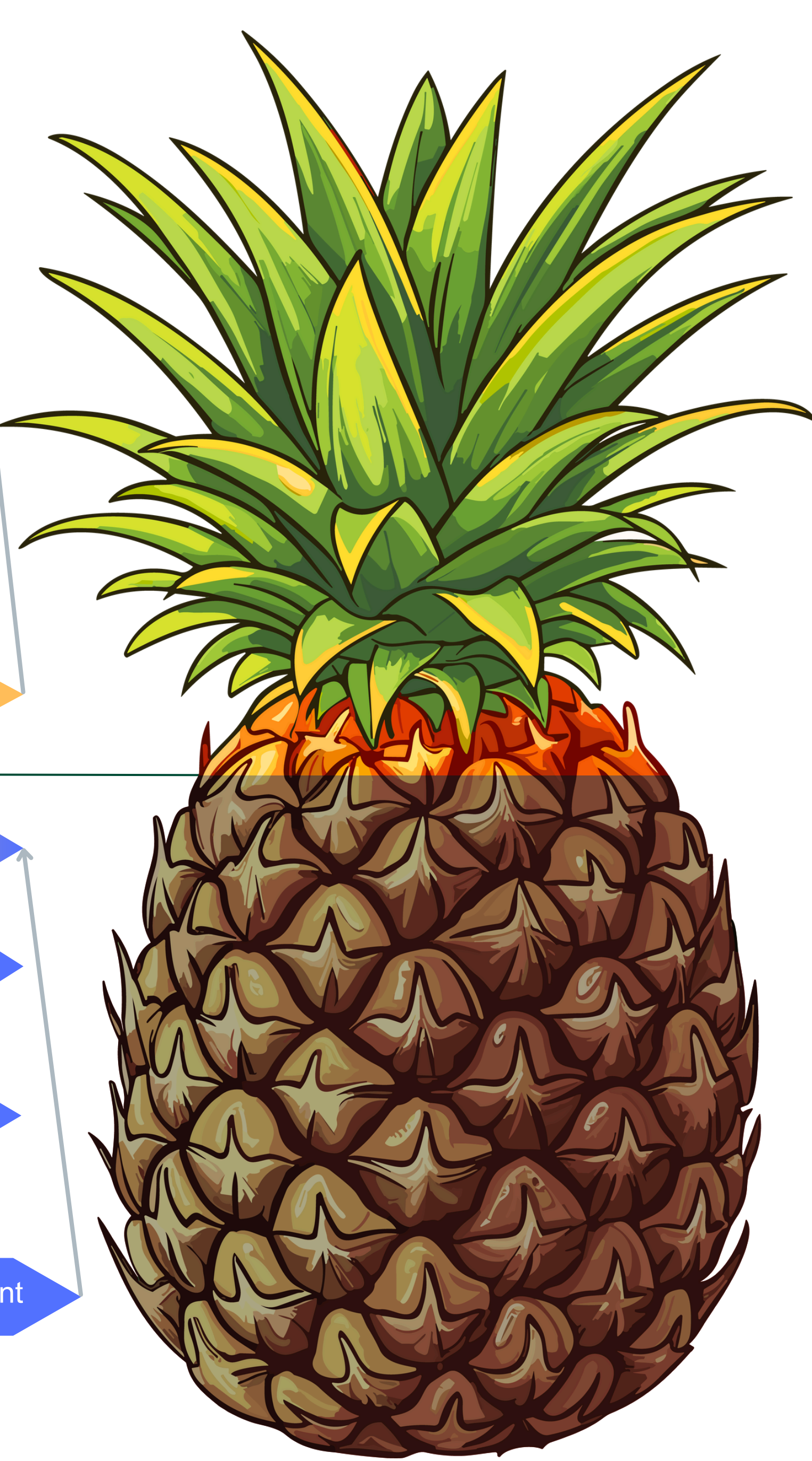
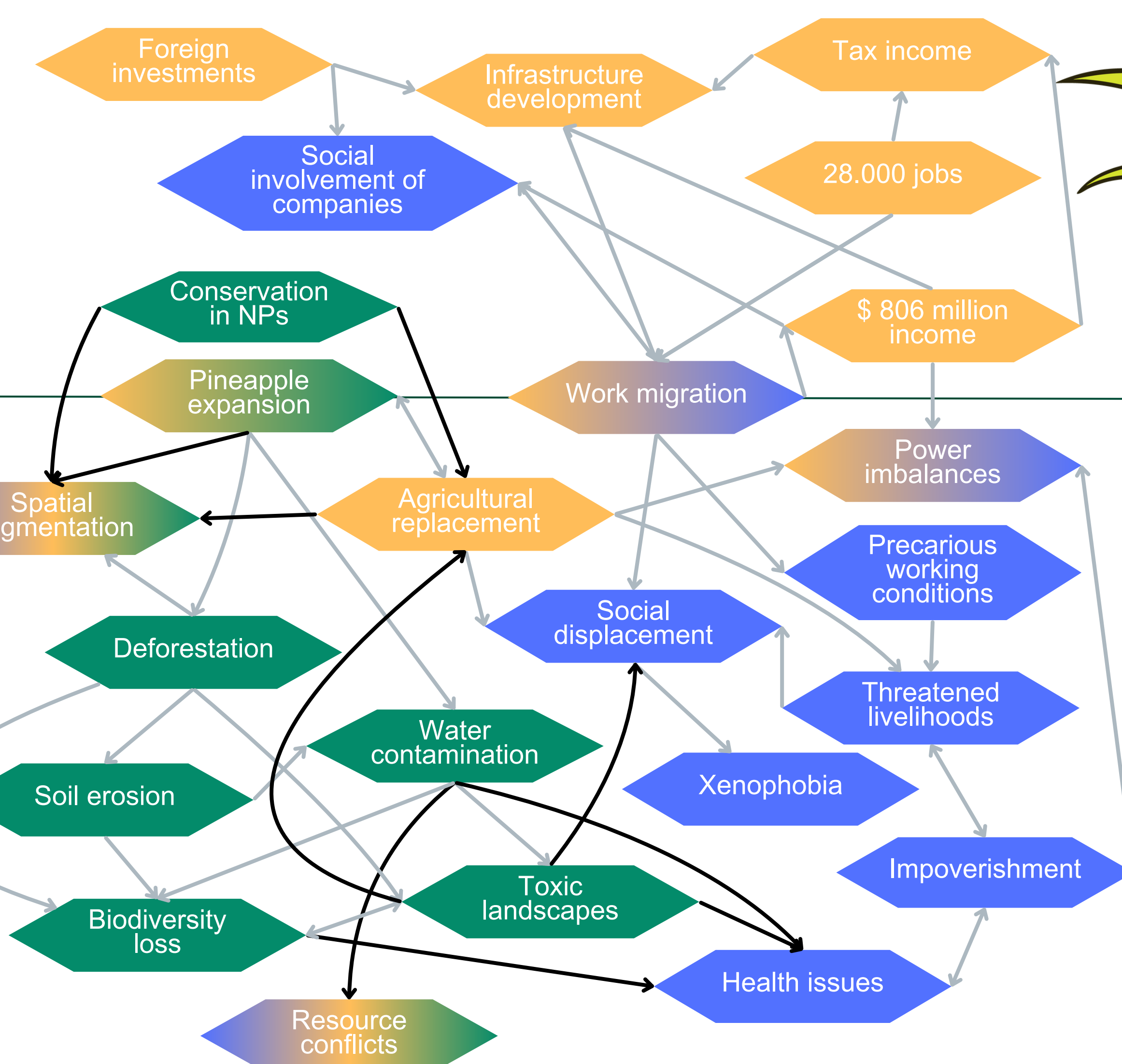
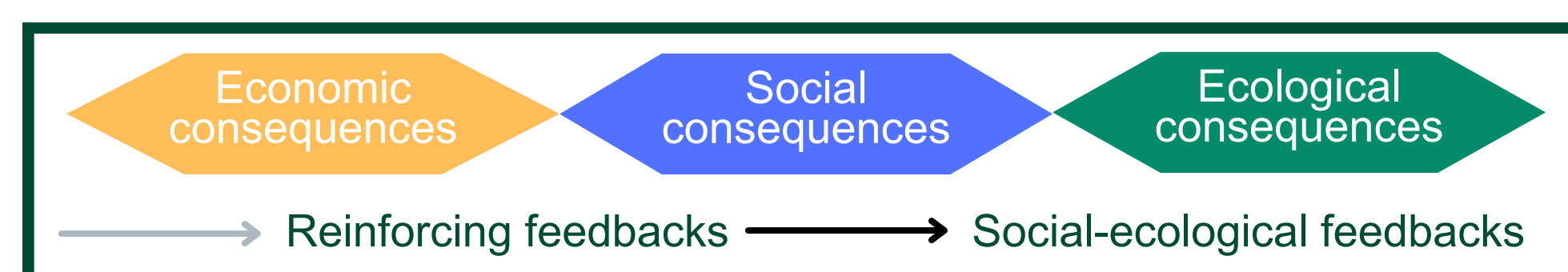
### METHODOLOGY

To systematically compare both sustainability paradigms, as well as to disentangle potential social, ecological, and coupled social-ecological dynamics resulting from pineapple production under each of them, we applied the **paradigm concept** (Halbe et al., 2013). The framework was used to structure data collected in a total of **16 semi-structured interviews** with Costa Rican stakeholders from the agricultural, environmental, and water sectors on the impacts of pineapple production and their perspectives on different forms of agriculture and food systems. The results of the studies were initially presented in various research projects between 2021 and 2024. For this poster, the results were for the first time aggregated, substantiated and extended by insights from relevant literature, and analyzed through the lens of the paradigm concept.

### RESULTS

Dimensions (applied to agricultural paradigms)	Desarrollo sostenible a la tica (DSAT)	Regenerative Development (RD)
<b>System perspective</b> <ul style="list-style-type: none"> <li>• At which level or scale is the paradigm focusing?</li> <li>• Which sustainability dimensions are considered?</li> </ul>	<ul style="list-style-type: none"> <li>• Focus on: companies and organizations embedded in international value chains; strengthening of national economy</li> <li>• Emphasis on economic sustainability <b>as means to</b> achieve social sustainability; attempt to minimize negative externalities on nature</li> </ul>	<ul style="list-style-type: none"> <li>• Focus on community level and embedment of farms into their socio-ecological contexts</li> <li>• Emphasis on positive, reciprocal feedbacks between social and environmental sustainability; economic sustainability as byproduct of strengthening local communities</li> </ul>
<b>Solution strategies</b> <ul style="list-style-type: none"> <li>• What agricultural practices are included?</li> <li>• Are there further practices to address social-ecological interactions?</li> <li>• How is a balance between economic, social, and environmental sustainability achieved?</li> </ul>	<ul style="list-style-type: none"> <li>• Large-scale <b>monoculture</b> plantation as the blueprint of production</li> <li>• General approach:                             <ul style="list-style-type: none"> <li>◦ provide and ensure social well-being through economic growth</li> <li>◦ achieve environmental sustainability through limiting harmful impact of agriculture and through land sparing</li> </ul> </li> <li>• <b>Weak sustainability</b>: justification of environmental degradation through economic growth</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Context-specific practices promoting soil health and agrobiodiversity</b>, e.g., multi-cropping, green manure, agroforestry</li> <li>• General approach:                             <ul style="list-style-type: none"> <li>◦ promote and nurture connectedness of people and nature (land sharing)</li> <li>◦ learn from and with nature</li> </ul> </li> <li>• <b>Strong sustainability</b>: ecological sustainability understood as foundation of social and economic sustainability</li> </ul>
<b>Risk and uncertainty management</b> <ul style="list-style-type: none"> <li>• How are uncertainties and risks framed?</li> <li>• What strategies are in place to deal with uncertainties and risks?</li> </ul>	<ul style="list-style-type: none"> <li>• Control of nature through chemical inputs (e.g., fertilizers or pesticides)</li> </ul>	<ul style="list-style-type: none"> <li>• Minimize risks by building farming systems that are resilient to shocks, e.g. extreme weather events, through diversification of nature's contributions to people and strengthening of ecological systems</li> </ul>

### Status quo: Pineapple production under DSAT



### DISCUSSION

#### Evaluating the status quo

- Emphasizes economic growth and high agricultural yields for international markets
- Results in trade-offs, prioritizing economic gains over social and environmental sustainability
- Long-term economic growth may be undermined by neglected negative consequences

#### What could pineapple production under RD look like?

- RD focuses on biodiversity and soil health through multi-cropping systems, moving away from monocultures
- Emphasizes local value chains and strengthens local communities
- Fosters associativity of smallholder farmers and cooperatives
- Stronger controls of agrochemical usage
- More equitable development and wealth distribution
- Less emphasis on exports, more on local markets and consumption
- Potential reduction in economic gains from exports, but increases credibility in sustainable practices
- Economic losses might be counterbalanced by promoting agroecological tourism

### CONCLUSION

- The RD approach aligns with the conference theme, emphasizing the interconnectedness of human and ecological well-being
- RD supports the integration of social and ecological systems
- Existing best practice example: **Nicoverde**, association of aprox. 120 smallholder farmers practicing regenerative agriculture

### RELATED LITERATURE

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