

'Nature-based Solutions': essential to safeguard the Dutch Caribbean against the consequences of climate change



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Resilience to climate change lost due to accumulation of deleterious environmental pressures

- higher air and seawater temperatures
- sea level rise
- acidification of the ocean
- aridification of the climate
- invasive alien species and diseases thriving
- plummeting biodiversity
- increasing frequency and severity of hurricanes

Willemstad, Curaçao

Where to start?

- Lost cause?
- Costs?

No: let nature help!

But first we need to help nature to recover its natural resilience!

Island-own biodiversity: high but also threatened

Saba, St. Eustatius, St. Maarten



Special Species Lists
Dutch Caribbean
(DCNA Dec 2020)

200+ species of local or international legal status

Preliminary checklist of extant endemic species and subspecies of the windward Dutch Caribbean (St. Martin, St. Eustatius, Saba and the Saba Bank)

Authors: O.G. Bos, P.A.J. Bakker, R.J.H.G. Henkens, J. A. de Freitas, A.O. Debrot

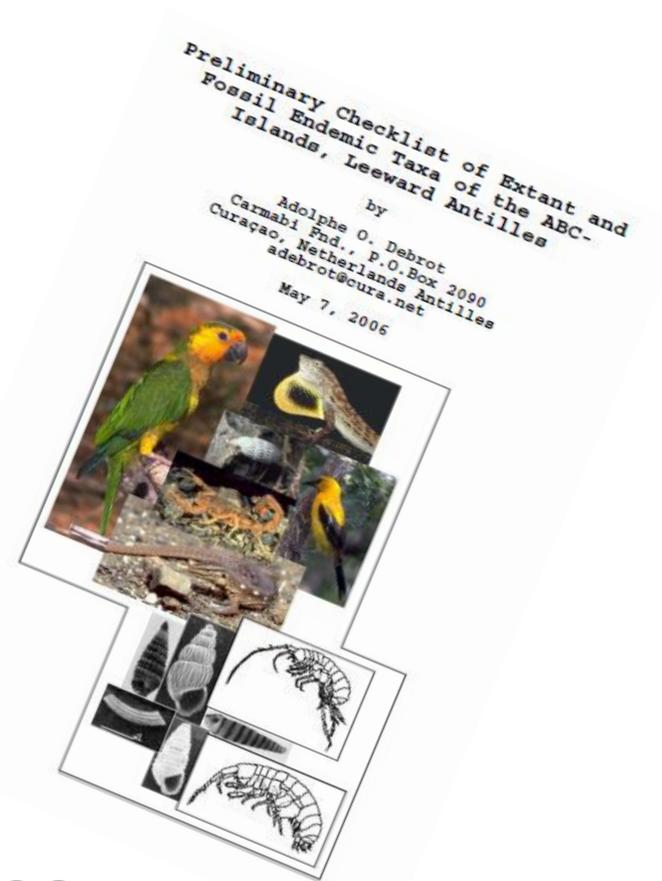


Wageningen University & Research report 020218

223 endemic species and subspecies



Aruba, Bonaire, Curaçao



163 endemic species and subspecies

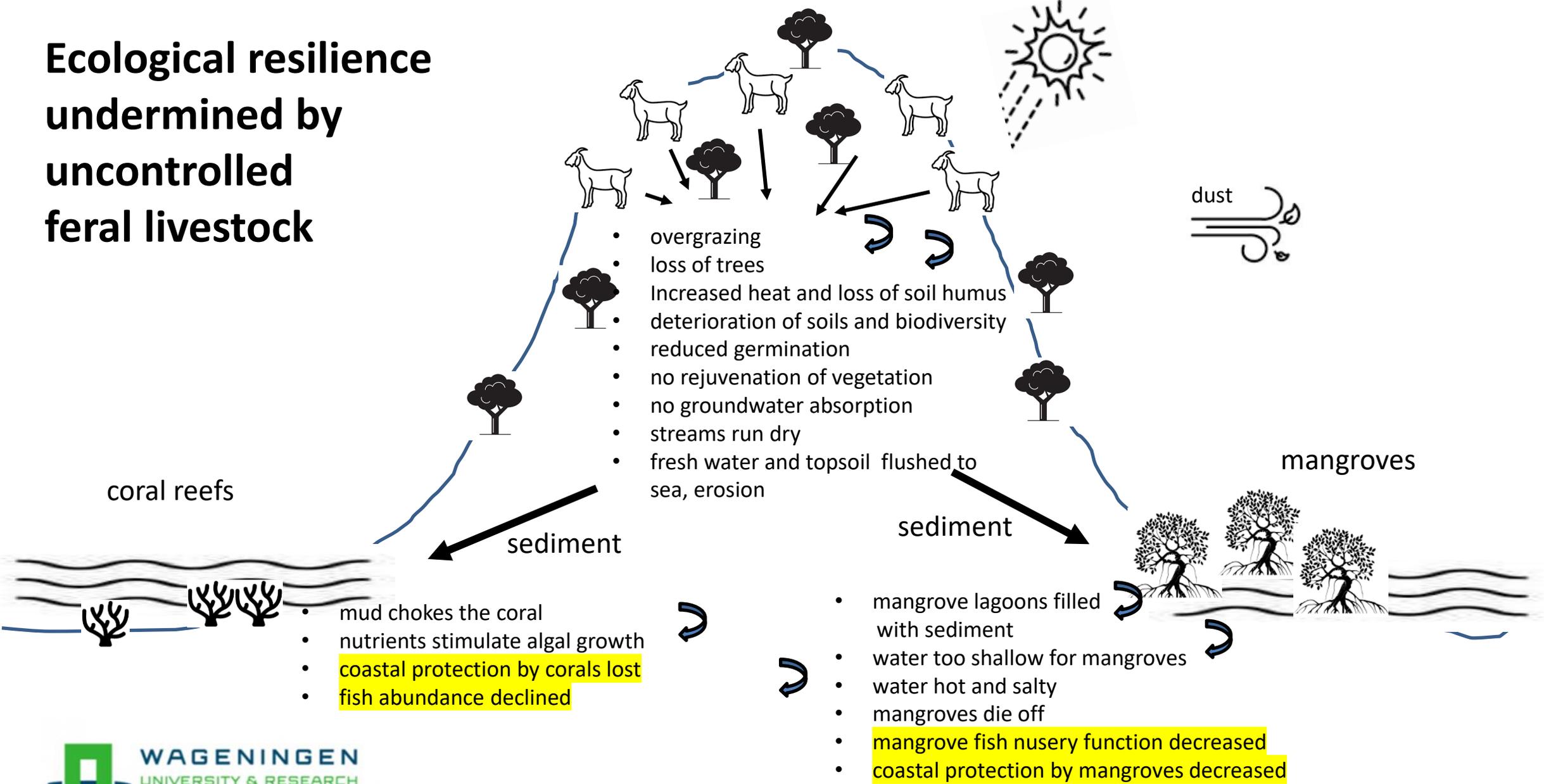
Forests

- Local amelioration of climate
- CO₂ capture and storage
- Erosion control
- Groundwater influx
- Retention of soil fertility

Deforestation and erosion due to feral livestock



Ecological resilience undermined by uncontrolled feral livestock



Saliña di Vleit, Bonaire

example of erosion of topsoil into lagoons and onto the reef



Cost-Benefit assessment for feral livestock, Bonaire



Benefits

- **Collective**
 - Food security
 - Some foreign currency savings
 - Some slaughterhouse fees
 - Minor tax revenues
- **Individual**
 - Yield of meat for consumption or sale
 - Avoidance of property tax?

Costs

- **Collective**
 - Loss of biodiversity
 - Animal suffering
 - Destruction of public ornamental plantings
 - Requires homeowners to fence properties
 - Traffic risks and casualties
 - Dust impacts to machines and electronics
 - Erosion of soil fertility
 - Damage to coral reef, fishing and tourism
 - Loss of freshwater
 - Stagnates agricultural modernization (no range management no herd management possible)
- **Individual**
 - Labour and care of animals
 - Supplemental feeding
 - Theft, disease and traffic
 - Slaughter costs

**Conclusion: High costs, few benefits,
for the keeper as well as for society**

Roaming animals “cultural heritage”? No. Big misunderstanding! Roaming, unmanaged livestock impossible to be combined with productive agriculture or animal husbandry. Therefore, in the past, as it is now, loose roaming animals have always been legally forbidden. Below two relicts of cultural heritage that demonstrate the costly measures taken in the plantation era to restrict and control the movement of livestock.





Natural recovery can be very fast once grazers are excluded

Agriculture: innovations needed in climate control, water efficiency and drought resistant species



Mangroves

← Consequence of filling-in of mangroves with eroded topsoil





Active interventions for Nature-based revitalization of mangrove-ecosystems

- Harvest and reuse of accumulated sediment (new “black gold”) while restoring water depth and circulation

Coral reefs seriously overfished in the past: no recovery yet in sight!

Then (1950s)

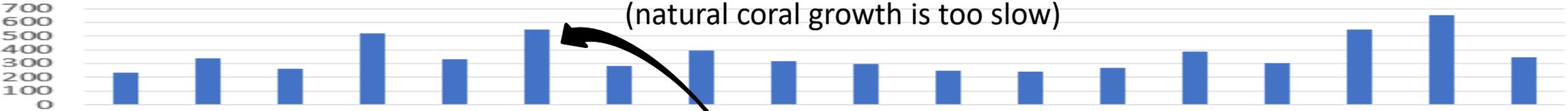


Now

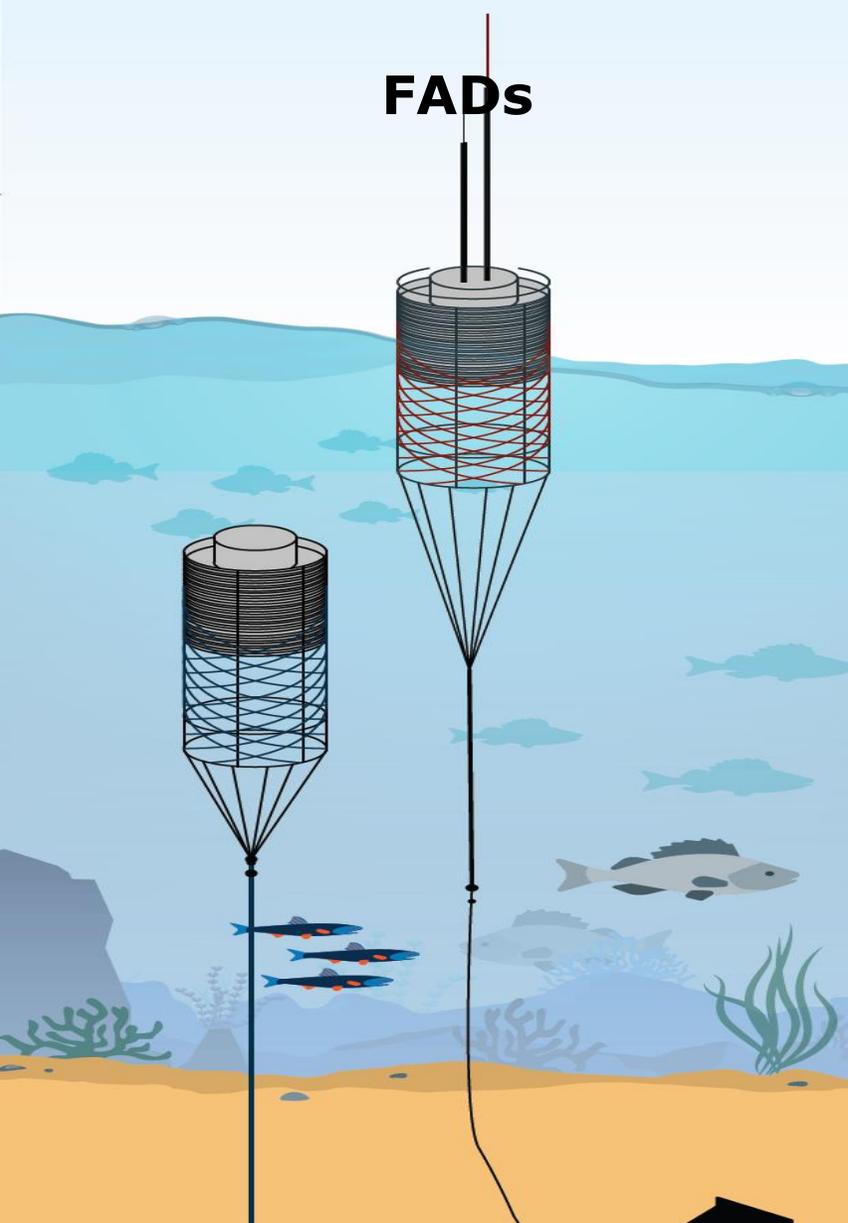
Artificial reefs

Active intervention for Nature-based recovery

Fish counts



FADs



Move fishing pressure to underfished pelagic stocks to give the reef a chance



Summary of four Nature-based interventions for resilience in climate change

(green = actions, yellow = effects)

