# How science supports a sustainability transition on Samothraki

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*(upon strong support from the SEC team, Panos Petridis, Dominik Noll, master students, Greek partners and many locals)*

***Samothraki Open Forum 2019***

***„Sustainable Growth through Synergies“***

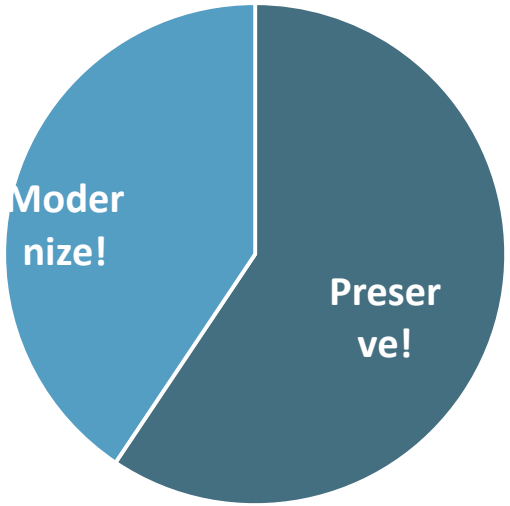
sec social ecology vienna

# In a Nutshell

- **Point of departure:** the wish to preserve an island with unique heritage from potentially destructive pathways and to achieve an alternative development model (for example as a UNESCO Biosphere Reserve).
- What started as a **response** to environmental degradation by concerned citizens, ten years ago, has developed into an ambitious and evolving research program.
- In a **transdisciplinary and open-ended process,** ownership has gradually shifted from scientists to local actors, co-creating a research agenda along the way.

# Who shares the vision of sustainability on Samothraki?

Permanent Residents





**2008**

surveys of travellers on ferry,
> 800 questionnnaires

**2015**

Tourists



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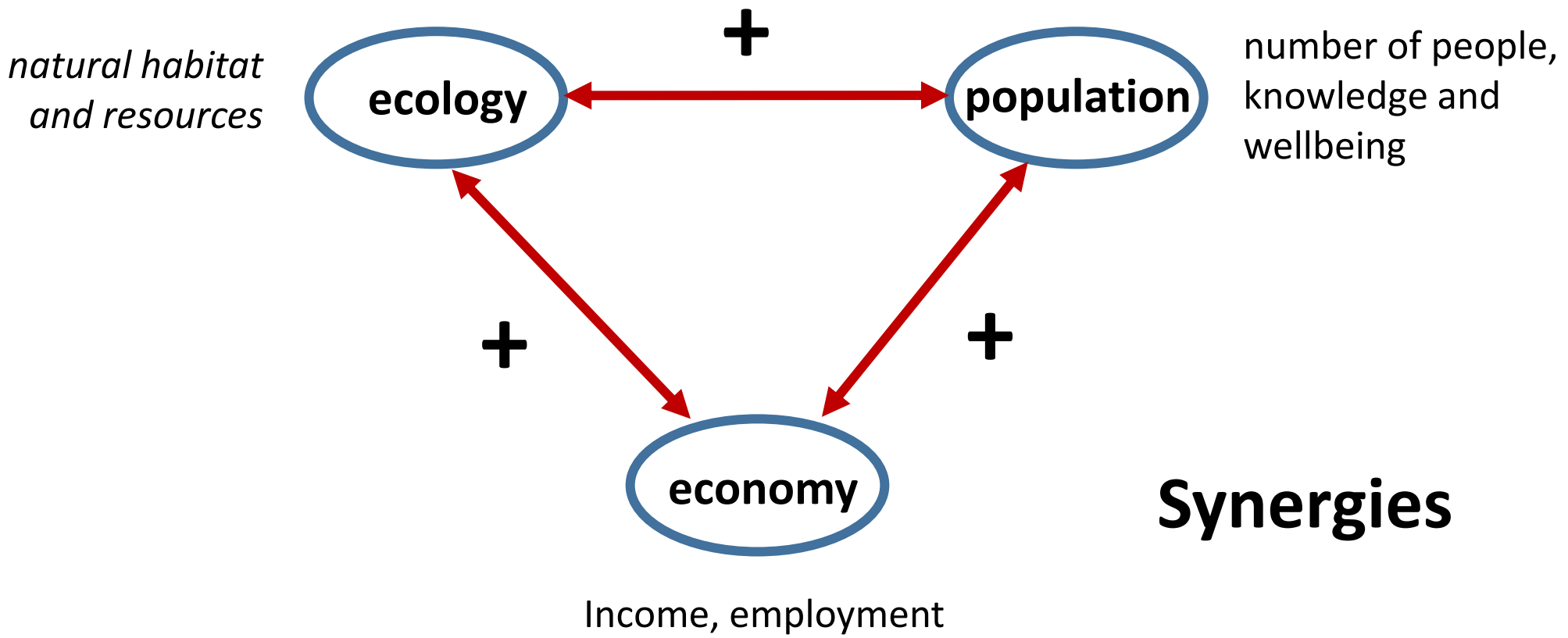
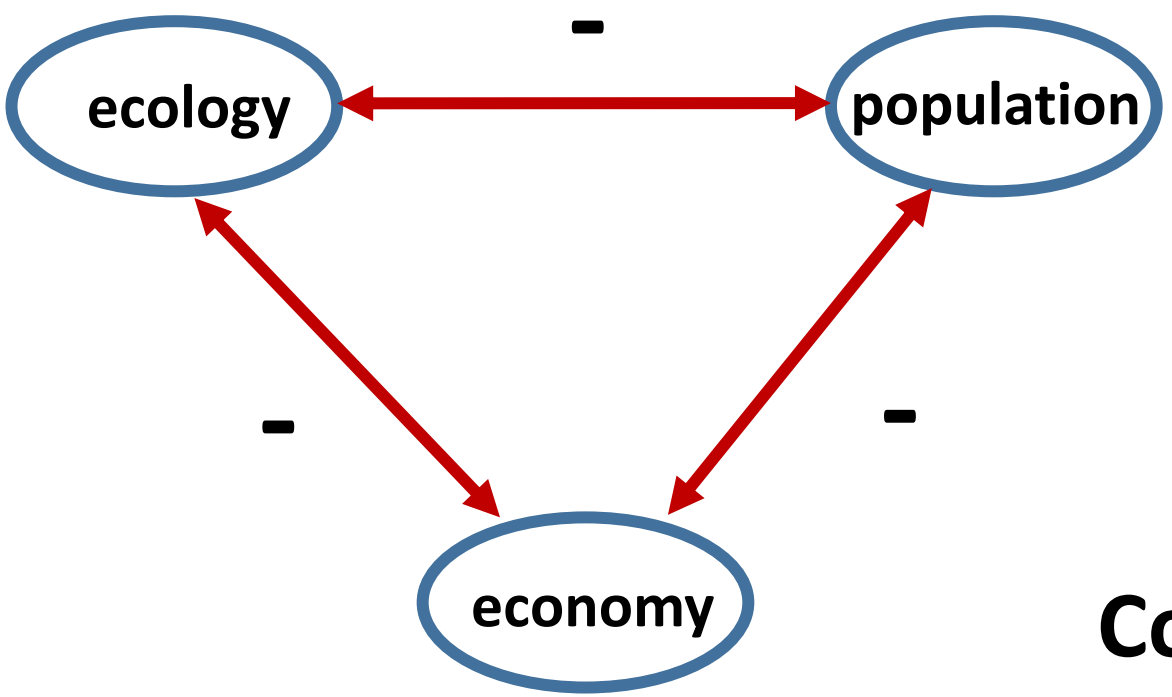
# Point of departure: magic / vicious triangle of sustainability




**Synergies**

# Point of departure: magic / vicious triangle of sustainability

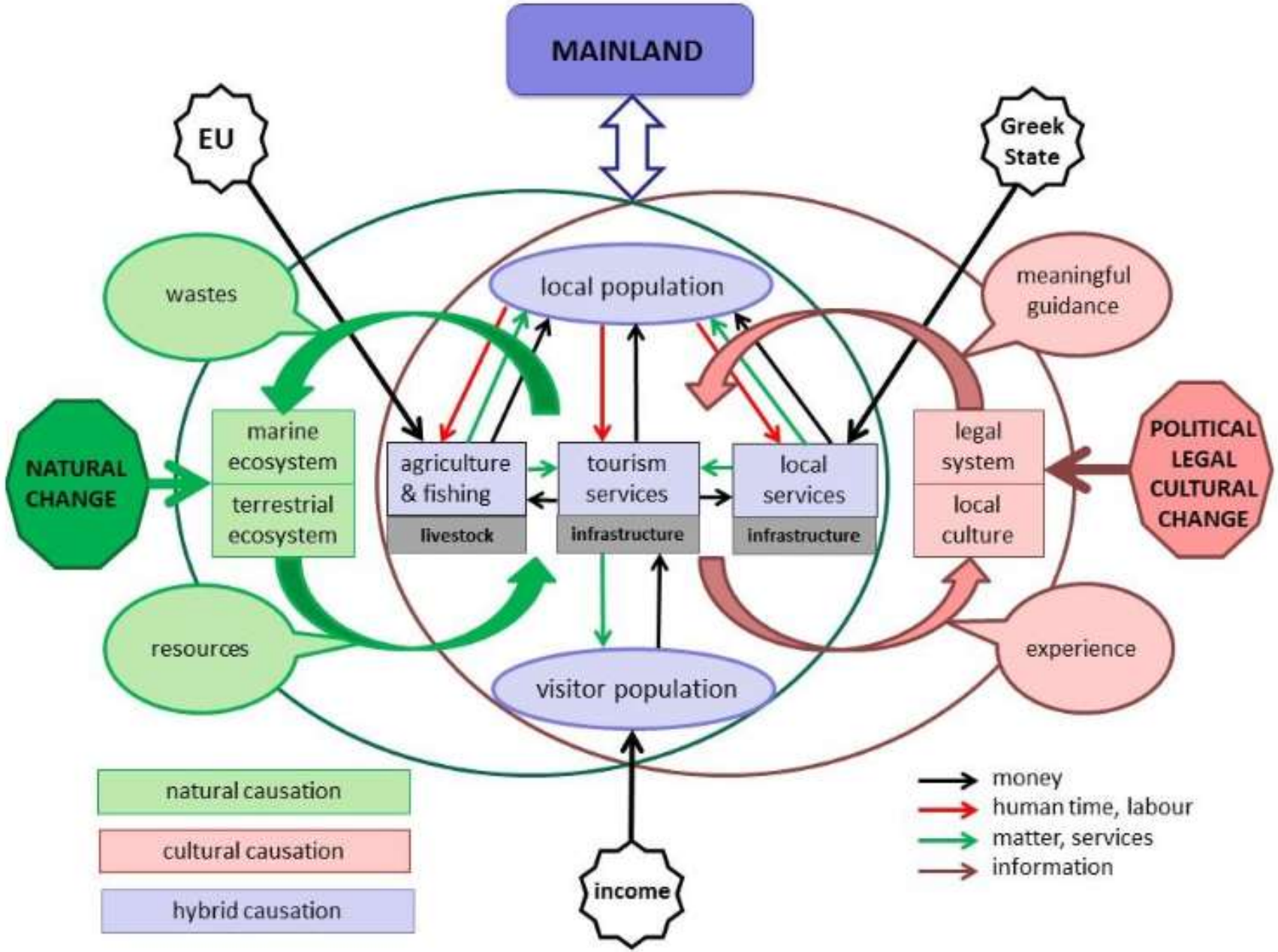
*natural habitat and resources*




number of people, knowledge and wellbeing

Income, employment

**Competition**




*Comprehensive model of the island's socioecological system*

# Socioecological research seeks to identify and support synergies

## as well as be aware of competitions, particularly, if they may lead to dangerous tipping points

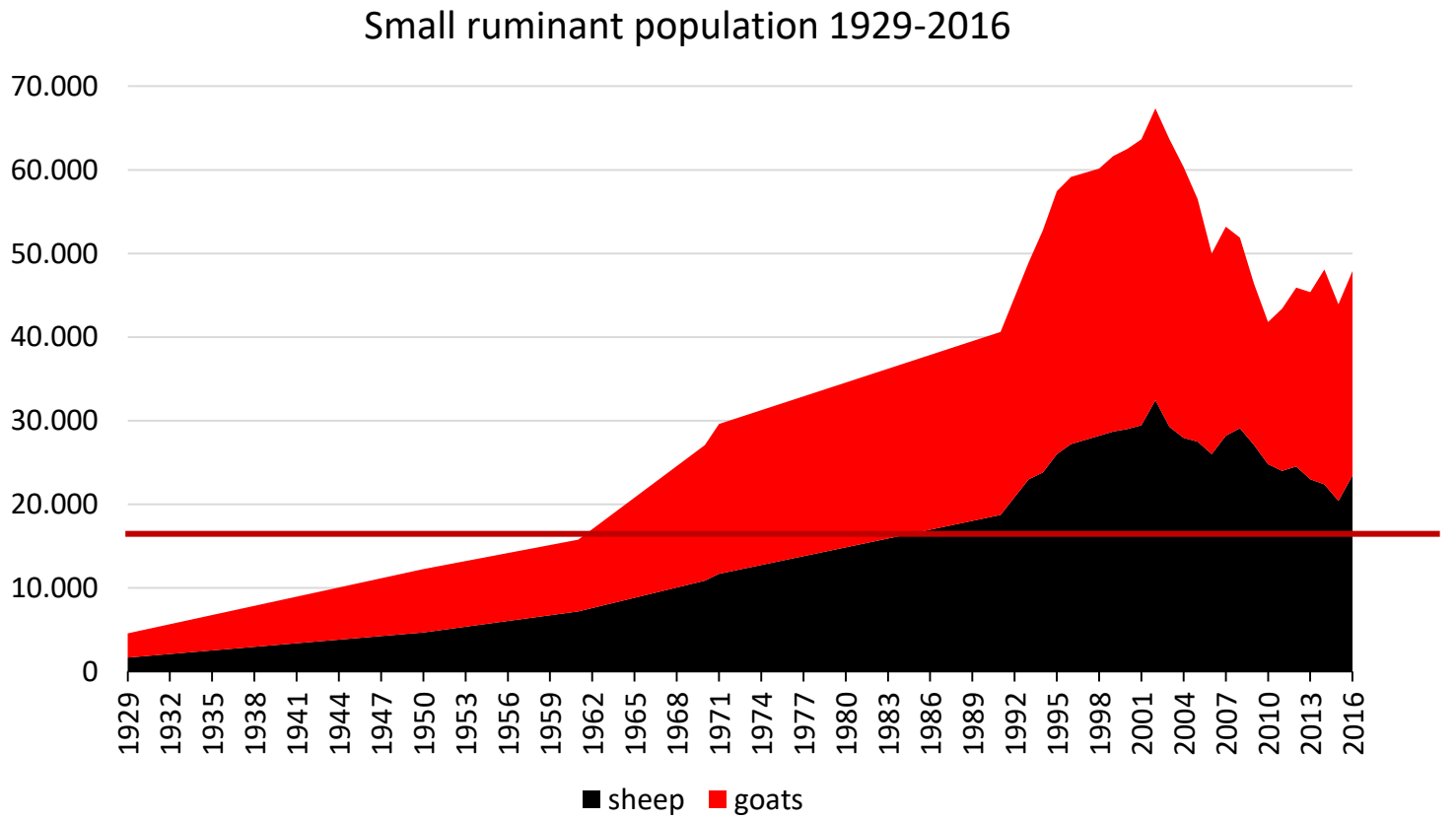
1. **Diagnosis**: identify critical elements by means of public statistics, interviews with locals, surveys, satellite imaging and technical measurements
2. **Analyze:** identify key systemic (causal) mechanisms by statistical analysis, modelling and local knowledge / narratives
3. **Solutions:** explore creatively possible solutions, also through comparison with similar cases elsewhere
4. **Practice:** win partners for certain solutions and try to put them into practice locally
5. **Evaluate and communicate:**

# Case A: Livestock herding

1. **Diagnosis:** very high number of free roaming small ruminants – overgrazing and strong erosion – low share of meat/yoghurt/cheese from local sources – low income of farmers.
2. **Analyze:** why did animal numbers increase so strongly and then decline? Are local animal products underutilized, and why? From which sources comes farmers‘ income?
3. **Solutions:** Fewer and more well fed animals – utilizing high quality animal products locally (synergy with tourism) – stronger marketing position for farmers through collaboration
4. **Practice:** animal numbers going down**,** successful experiments with BSPs, farmers cooperative founded, deficient slaughtering house activated …

# Numbers of sheep and goats on Samothraki 1929-2016

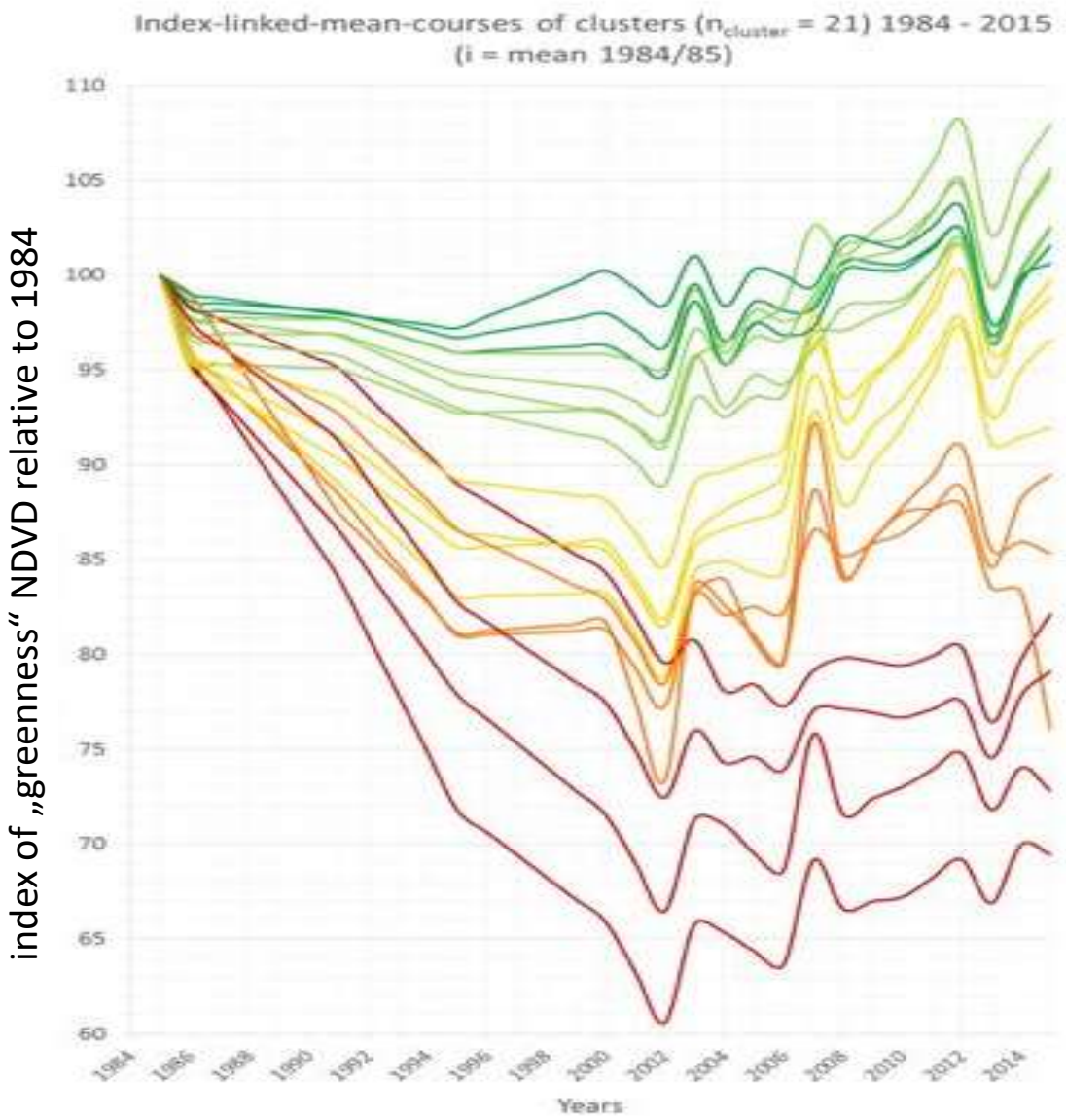
*Case A diagnosis*




EU cross compliance

Source: Noll 2018, ELSTAT, own interpolations

*Case A diagnosis*




# Satellite images of Samothraki 1984-2016: strong decline in vegetation cover

The majority of land patches loose their „greenness“, their vegetation cover, between 1984-2002.
After the climax number of animals in 2002 there is some recovery.
Still: most patches are much less green today than in 1984

Source: Markus Löw 2018 master thesis, based on annual satellite data

# Case A: Livestock herding

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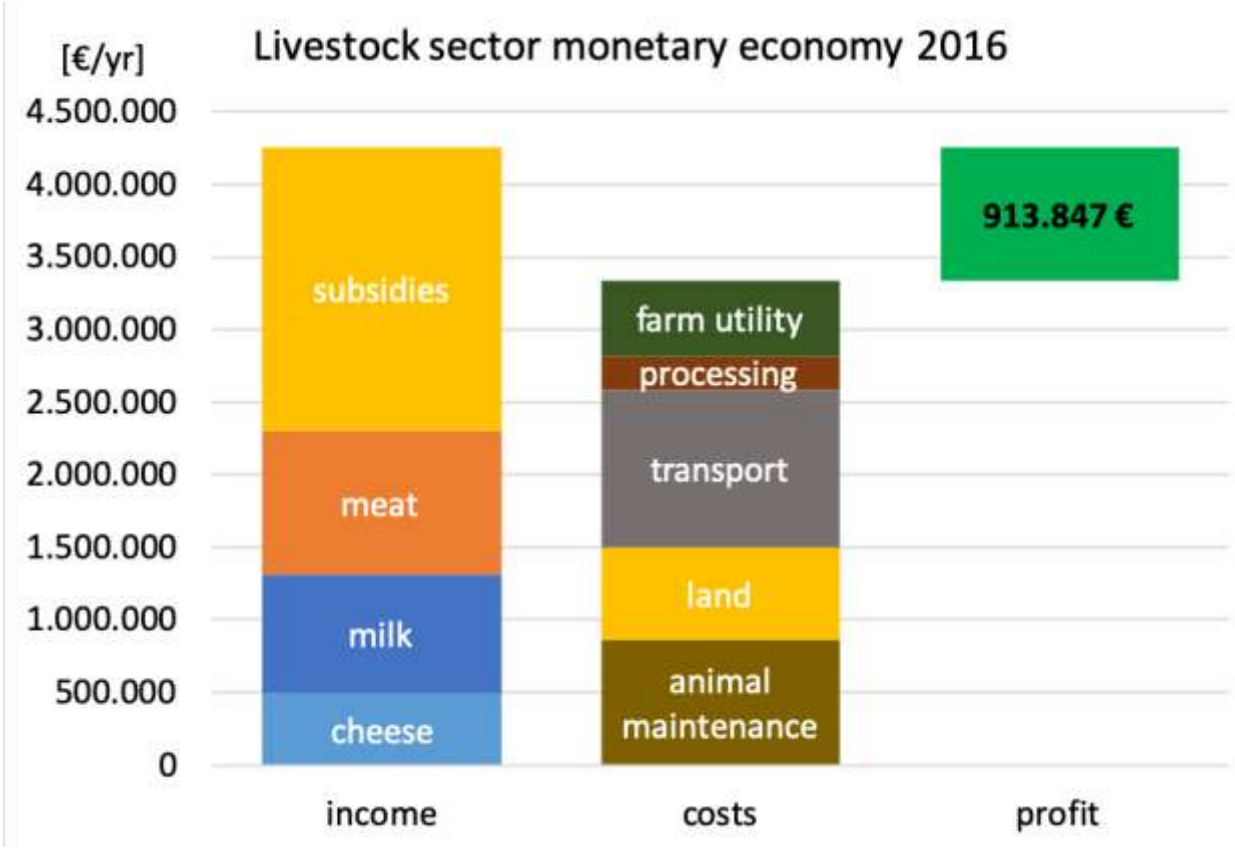
2. **Analysis:** why did animal numbers increase so strongly and then decline? Are local animal products underutilized, and why? From which sources comes farmers‘ income?

# Why did livestock numbers increase so much?

*Case A analysis*



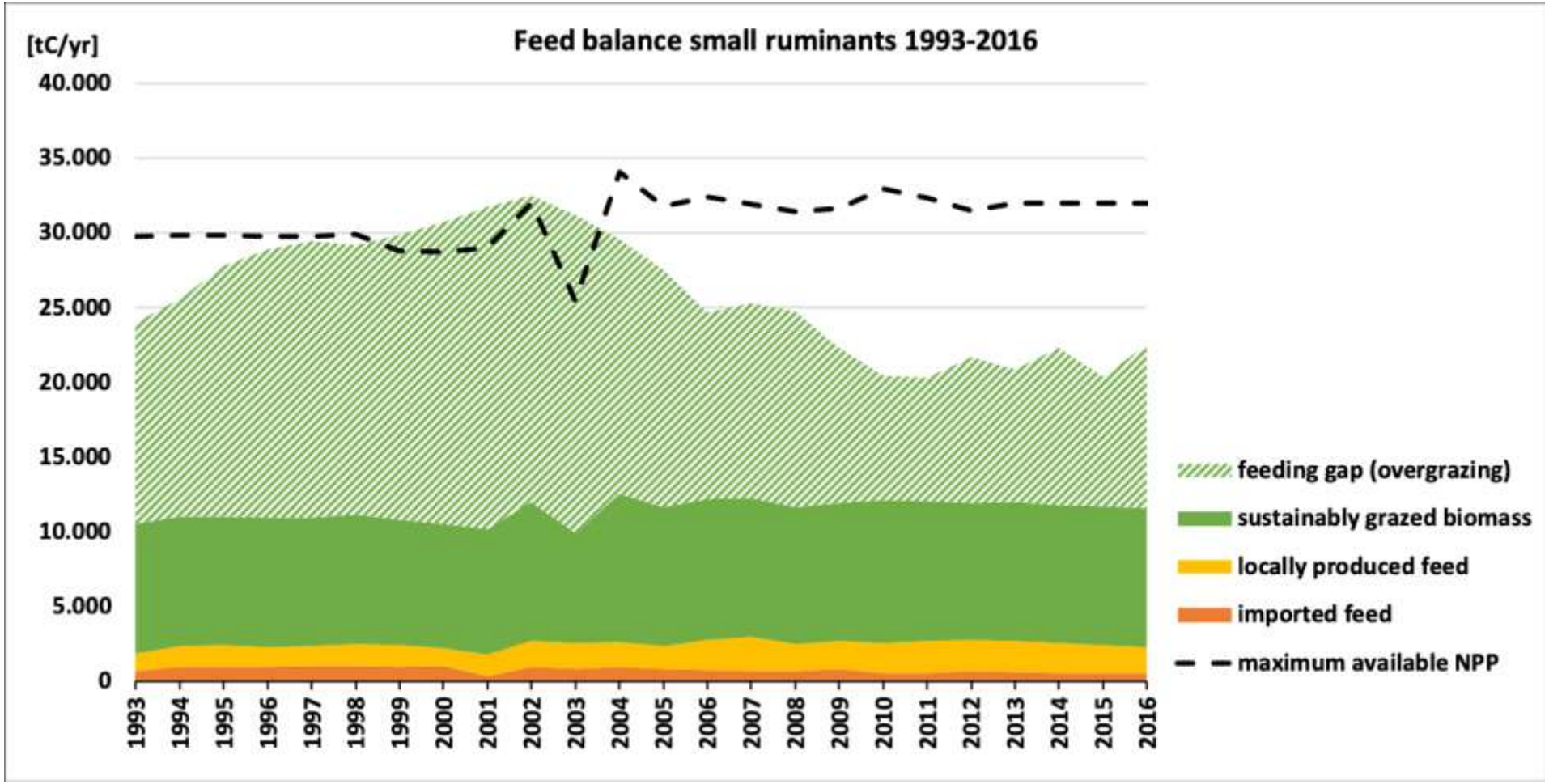

**Key answer: because of the agricultural subsidy system** (first Greek, then European) paying „per capita“ of animal

Nowadays, payments are no more „per animal“, but still believed to be

Net income from subsidies about 5400€ / farmer, or 20€ /animal and year

Source: Noll 2018, own calculations from EU Transparency Database and farmer interviews

# Feed balance of sheep & goats: continuous overgrazing, and years of starvation



# Case A: Livestock herding

*Case A solutions put into practice*

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3. **Solutions:** Fewer and more well fed animals – utilizing high quality animal products locally (synergy with tourism) – stronger marketing position for farmers through collaboration
4. **Practice:** animal numbers going down (but not enough!), successful experiments with „Biodiverse Sown Pastures“ (BSPs), farmers cooperative founded, deficient slaughtering house activated …

# Case B: Lack of Forest regrowth

1. **Diagnosis:** Oak forests in mountain areas declining, risk of severe landslides increasing (further aggravated by climate change)
2. **Analyze:** Investigation of age structure of oak forest patches (with local „citizen scientists“) and frequency of seedlings. Results: forests overaged, but still do seed – seedlings are consumed by goats.
3. **Solution:** Start an initiative to protect young trees / seedlings from being foraged with the help of local citizens
4. **Practice:** planned for 2019-2022

# Case B: Lack of forest regrowth, studied by local citizens under guidance of C.Heiling 2018

*Case B diagnosis & analysis*


Forest die-back on
Fengari

# Local citizens supporting Carina in measuring the woods 2018

# Case B: Lack of Forest regrowth

*Case B solutions put into practice*

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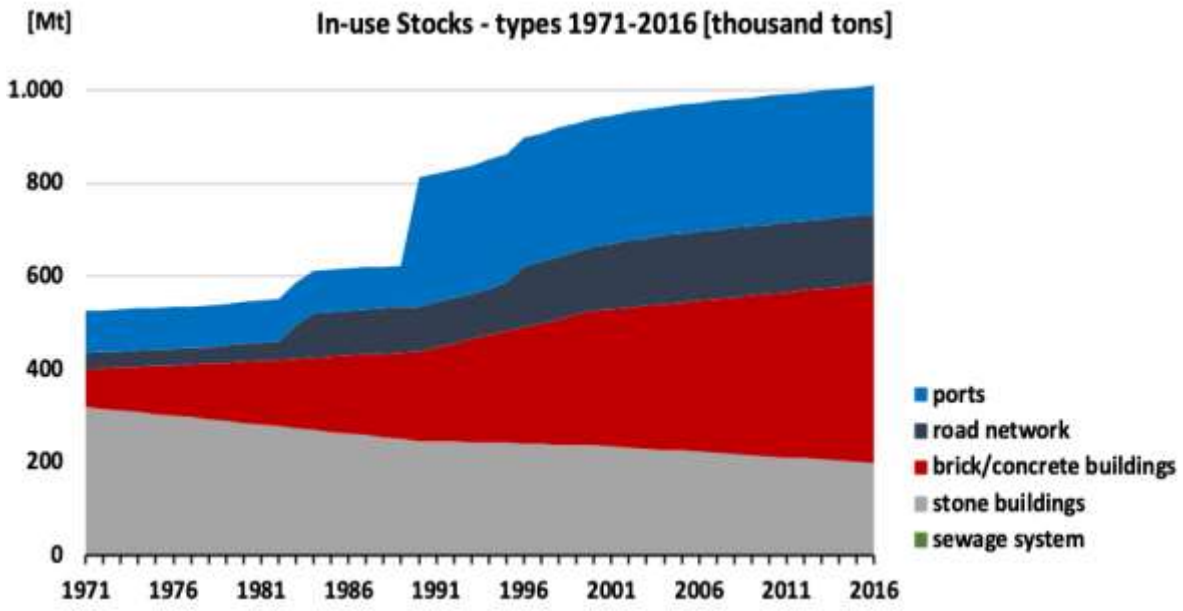
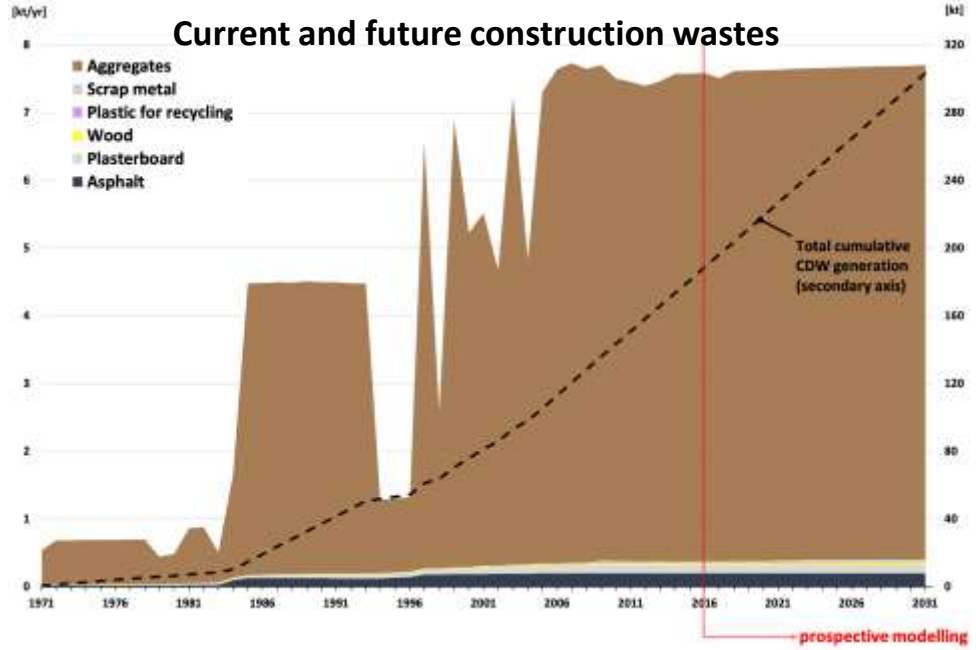
# Case C: growing tourism – growing consumption – growing wastes – growing unexpected costs

1. **Diagnosis:** While traditionally there was hardly any waste (houses rebuilt from stones, food remains fed to animals, wood and paper burnt in the herth), now wastes are piling up and cannot be disposed of on the island
2. **Analysis:** additional infrastructure from new materials (concrete, metals, plastic) built – need repair and create wastes to be disposed of. Increased household and tourist consumption of commodities imported to the island create hundreds of tons of waste to deal with.
3. **Solutions:**
4. **Practice:**

# More consumption creates more wastes

## Construction and infrastructure wastes




Source: Noll et al. 2018

## Household and tourism wastes

Preliminary estimate: 100 kg waste / person & year > locals amount to 300t / year, plus tourists amounting to 80t > **Around 400 t household waste / year**

Among household wastes, about 40% are organic, compostable wastes (**160 t/year)**

# Case C: growing tourism – growing consumption – growing wastes – growing costs

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3. **Solutions:** Infrastructure: think ahead for future wastes. Use more traditional materials. Don‘t construct new roads in steep terrain! Household wastes: long learning process for waste separation.
4. **Practice:** Experiment with school children bringing organic waste from home and composting at school


Schoolchildren learning which wastes to bring from home to put into the school composting bin

Compost harvested and used to improve soil for flowers and vegetables in school garden

# Crucial preconditions for success:
# A new style of collaboration among locals

**Traditional (agrarian society) collaboration patterns**:

- family centered (or extended family: clientilism),
- hierarchical, little functional differentiation.
- Low level of mutual trust.
- Commons tend to be overused, while private property is protected.
- Context: no growth, zero sum games: the gain of somebody outside the family system, even if a short-term co-benefit, tends to turn into a long-term disadvantage.

**Required collaboration  patterns for a sustainability transition:**

- Network of like-interested individuals
- Flat hierarchies, high functional differentiation
- High level of mutual trust.
- Protecting commons (not only private property) as a mutually shared goal.
- Context: growth possible, chance for mutually beneficial solutions, adaptability to rapidly changing environment.