

Algae and the Aquaculture Bioeconomy – Aquaculture National Strategy of Israel 2025-2050

**Leading to: Turning desalination-brine nitrogen into
macroalgae biomass, bioactive products and
regional resilience**

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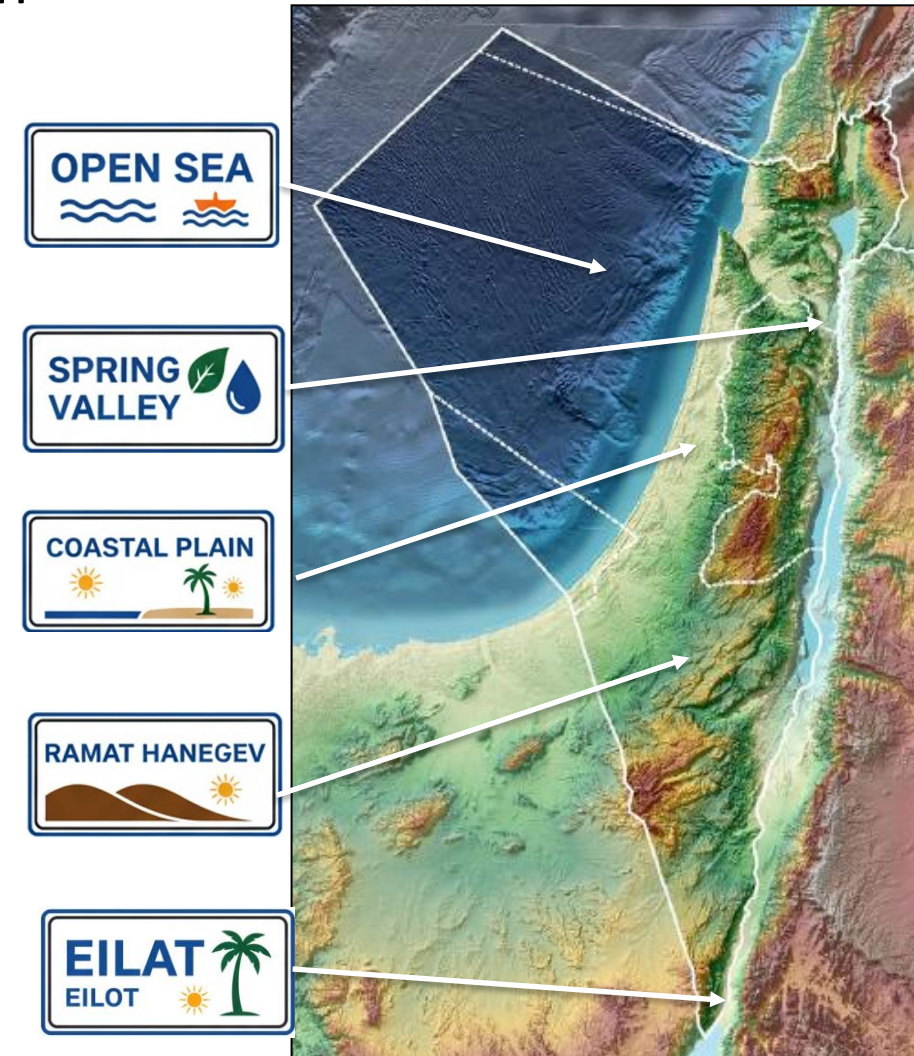
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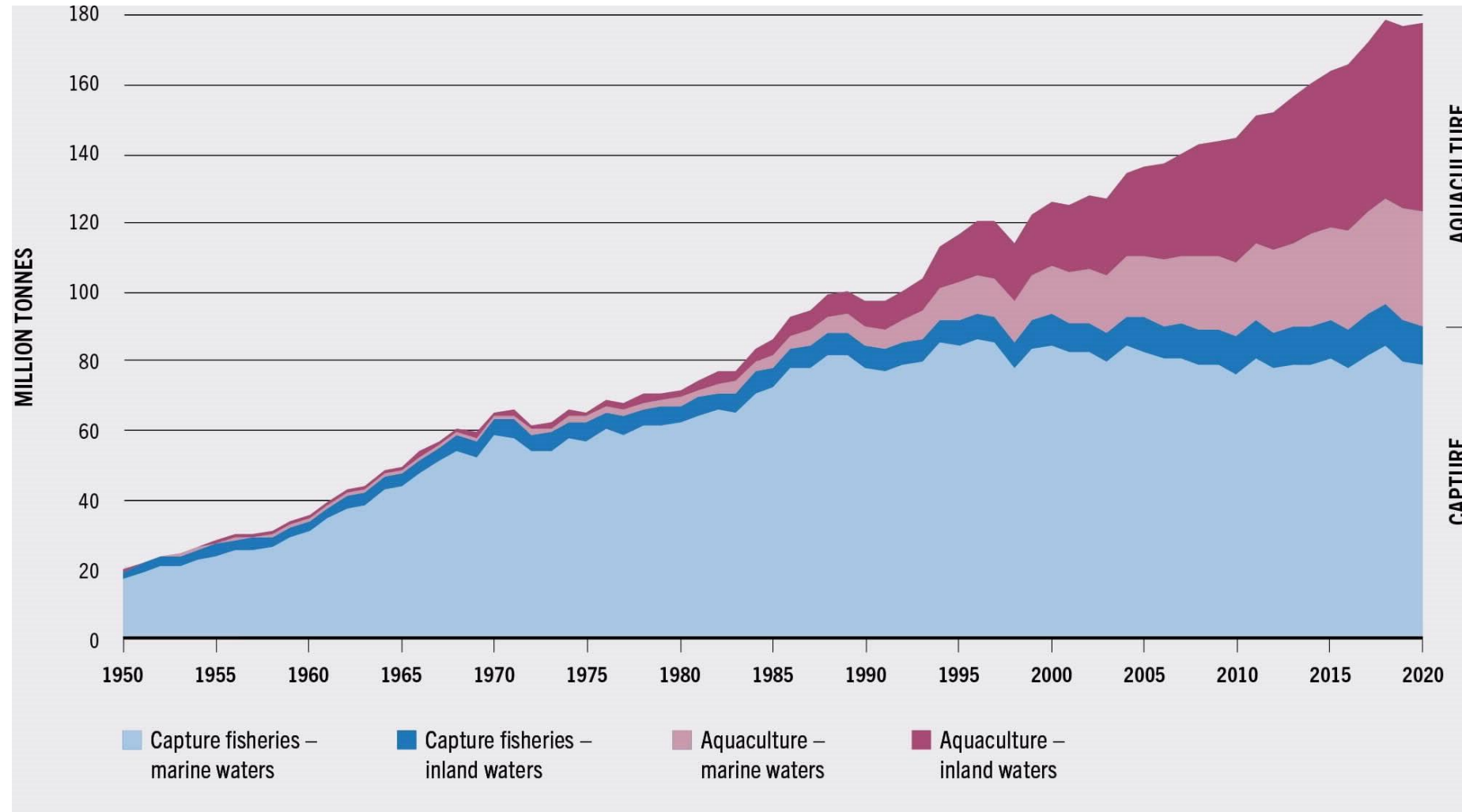
Presentation content

- National Food Security and Nutritional recommendation
- Aquaculture Strategic plan (1442 gov. resolution):
 - Top Strategic goals & main targets
 - Potential Economic Impact
- Eilat Eilat area
- Spring valley, Coastal plain, Negev desert
- Off shore cage farming in Mediterranean
- Regional international cooperation
- Nitrogen limitation and proposed circular economy solution – Eilat Eilat region

The new map of ISRAEL –
including Mediterranean water



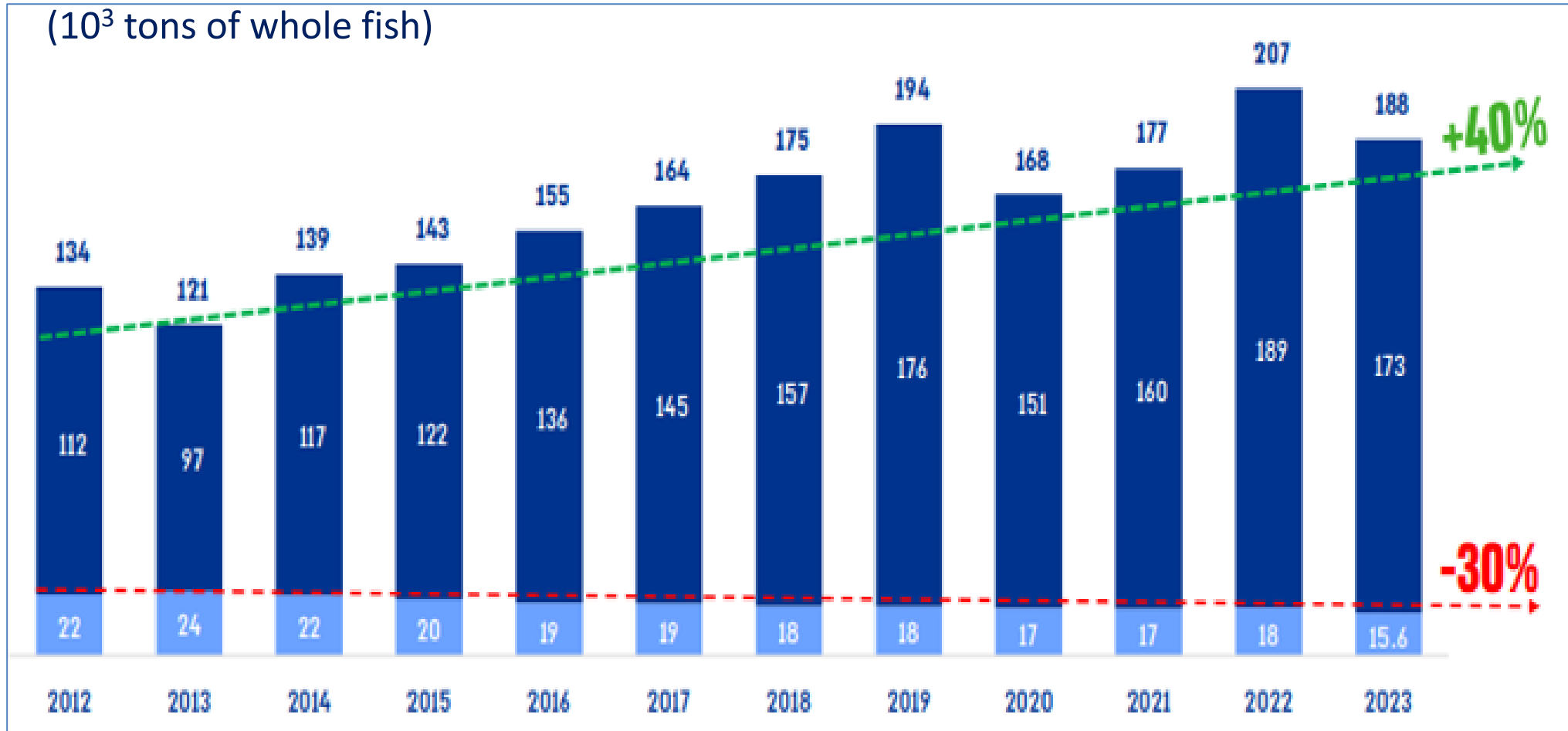
Global trends in fish and sea product supply



Aquaculture is the fastest growing food supply sector

Trends of fish supply in Israel

(10³ tons of whole fish)



Contrary to the ongoing increase in fish demand, local production volume has fallen by 30% during the past decade.

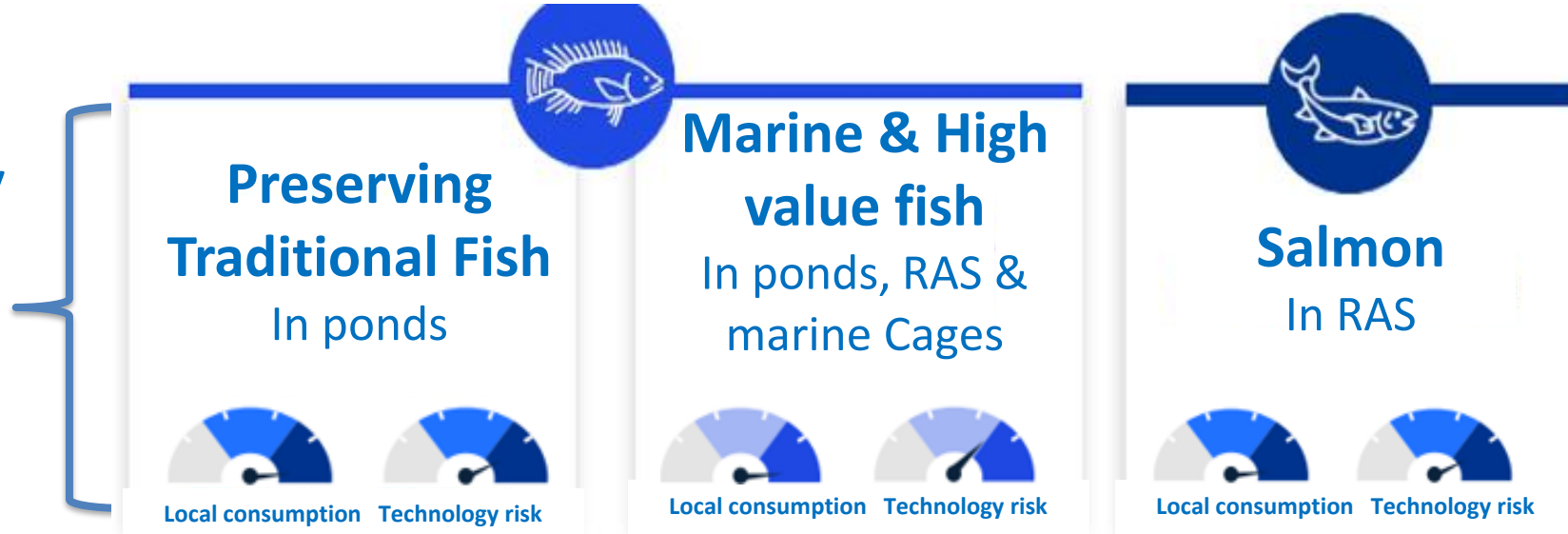
Top strategic goals

- I. Increasing local production and expanding share of fresh fish consumption for future food security.
- II. Improving profitability & increasing GDP of aquaculture - strengthening peripheral economy & employment diversification by sustainable production.
- III. Promoting export of innovation of advanced aquaculture & algal technologies for Israel's competitive edge.
- IV. Advancing Environmental & Social sustainability – reducing environmental negative impact, improving benefits and promoting fish welfare.



Main topics (by species & technologies)

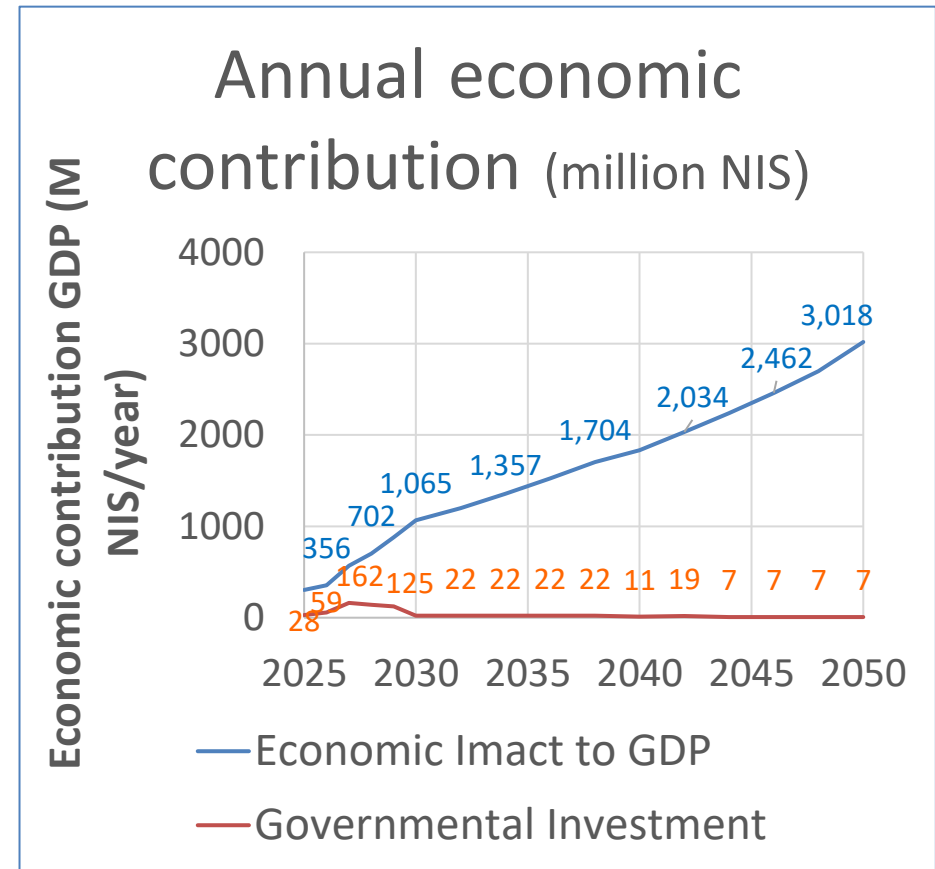
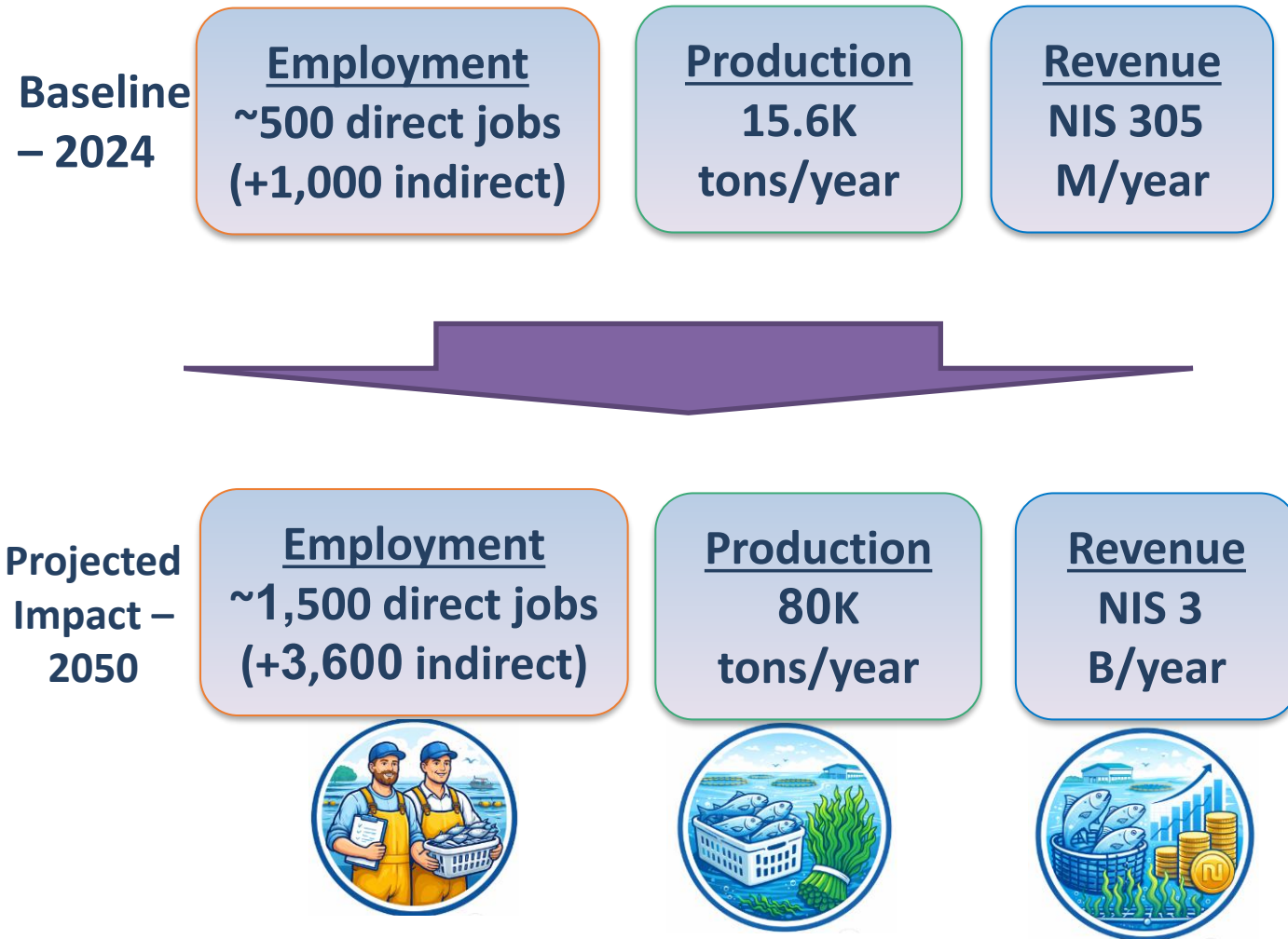
Food Security
& Local
production



Innovation for
export



Potential Economic Impact of the Program (up to 2050)



Based on a governmental investment of 640 M NIS up to 2050

Eila Eilat – Mariculture (land based) park sites

- 3 governmental decisions – allocated 220 M NIS (145 M to Eilat-Eilat and 75 M to national & MED aquaculture activities).
- 1,000 dunam (100 ha) in different statutory status – First tender Q3 2026.
- Designed for desert innovative aquaculture – mainly algal production.
- Infrastructure Barriers: Seawater supply pipeline – 60 M NIS
- Environmental constrain: Nitrogen to the Eila\Aqaba gulf – Algal biofiltration.



A Little bit history

2008- Evacuation of fish cages from Gulf of Eilat\Aqaba, following scientific debate & Governmental decision



Annual fish production 3,000 ton

Annual nitrogen release ~ 300 ton

2016-17- Feasibility study for land-based mariculture park



Following that – Environmental Scientific committee recommendation – limiting N input from Israeli side



Annual allowed nitrogen release to the Gulf: 22 ton/y

The regional problem: nitrogen became the bottleneck

Aqaba/Eilat needs more desalinated water and marine-bioeconomy space, but the nitrogen discharge limit is already binding.

- **Current policy limits land-based nitrogen inputs** into the Gulf; existing desalination brine already uses most of the allocation.
- The main source is nitrate-rich groundwater **concentrate in the brine of the "Sabha" desalination facility.**
- Result: expansion of desalinated water supply for irrigation and land-based Marine-aquaculture is constrained.

Allowed N
input to the
Gulf by Israel
Regulations

22 t N/y

Max. recommended
land-based load

Desalination
N input

~20 t N/y

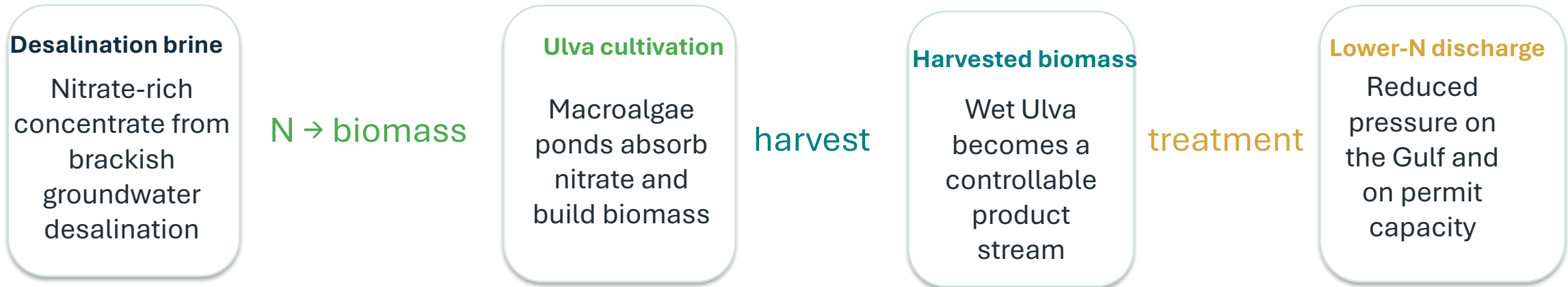
Current nitrogen load
in Sabha brine

Core message

The challenge is not only environmental protection; it is also water security, food security and rural economic development.

Circular opportunity: treat dissolved nitrogen as a resource

Instead of being limited by dispose of nitrogen, we can convert it into biomass and higher-value products.



The circular bioeconomy logic

Environmental service: measurable nitrogen removal.

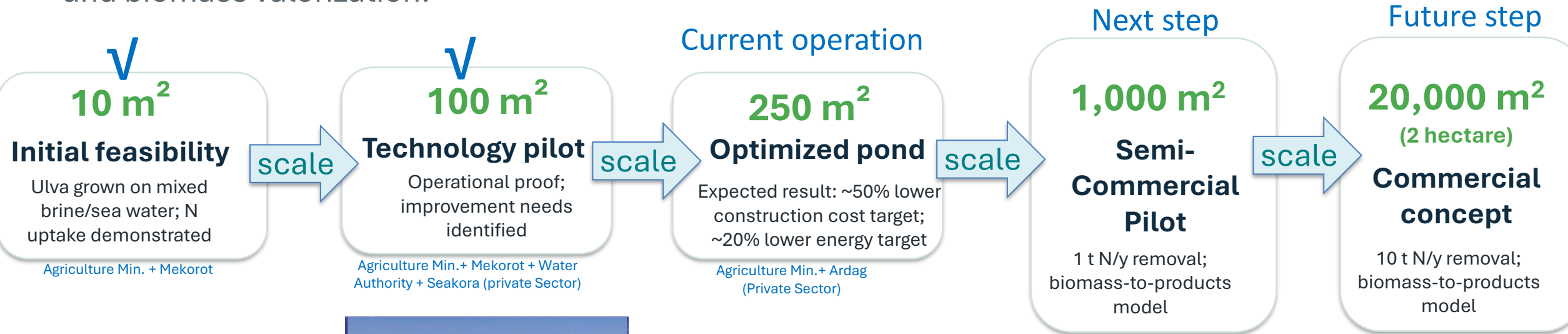
Industrial symbiosis: desalination waste stream becomes a cultivation input.

Biomass valorization: feed ingredients, Ulvan biostimulants, protein fractions and residual products.

Regional multiplier: water supply, aquaculture, desert agriculture and innovation ecosystem.

From pilots to a commercial demonstration pathway

The project is moving from biological feasibility toward cost reduction, performance stability and biomass valorization.

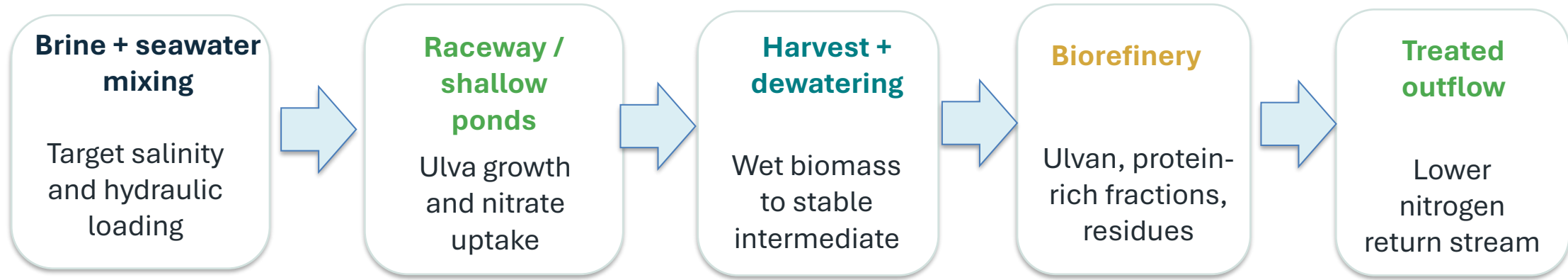


Demonstrative figure



System concept: desalination + macroalgae ponds + product extraction

A closed operational concept for nitrate uptake and biomass harvesting.



Design variables still matter: pond geometry, depth, flow, aeration, harvest interval, strain control and seasonal performance.

The business model depends on both the environmental service and the end-use value of the harvested biomass.

Thanks for your attention