استثمر في السعودية
INVEST SAUDI

Welcome to
King Abdullah University of Science and Technology (KAUST)

AGRICULTURAL & FOOD PROCESSING ROADSHOW

February 06, 07 2025

جامعة الملك عبدالله للعلوم والتقنية
King Abdullah University of Science and Technology

البرنامج الوطني لتطوير قطاع الثروة الحيوانية والسمكية
NATIONAL LIVESTOCK & FISHERIES D. P.

وزارة البيئة والمياه والزراعة
Ministry of Environment Water & Agriculture

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Fisheries Management Projects

Mark Dimech, Ph.D.
Marine Director

Exploration of the Exclusive Economic Zone (EEZ) and deep waters for the exploitation of new fisheries resources including Fish and Shrimp.

- One Year Research Cruise
- Using RV Taqnia
- Technical Proposal

KACST
مدينة الملك عبدالعزيز للعلوم والتقنية

Potential opportunities for the production of **fishmeal** in KSA.

Ecosystem Based Fisheries Management Framework for Impacted Coral Reefs

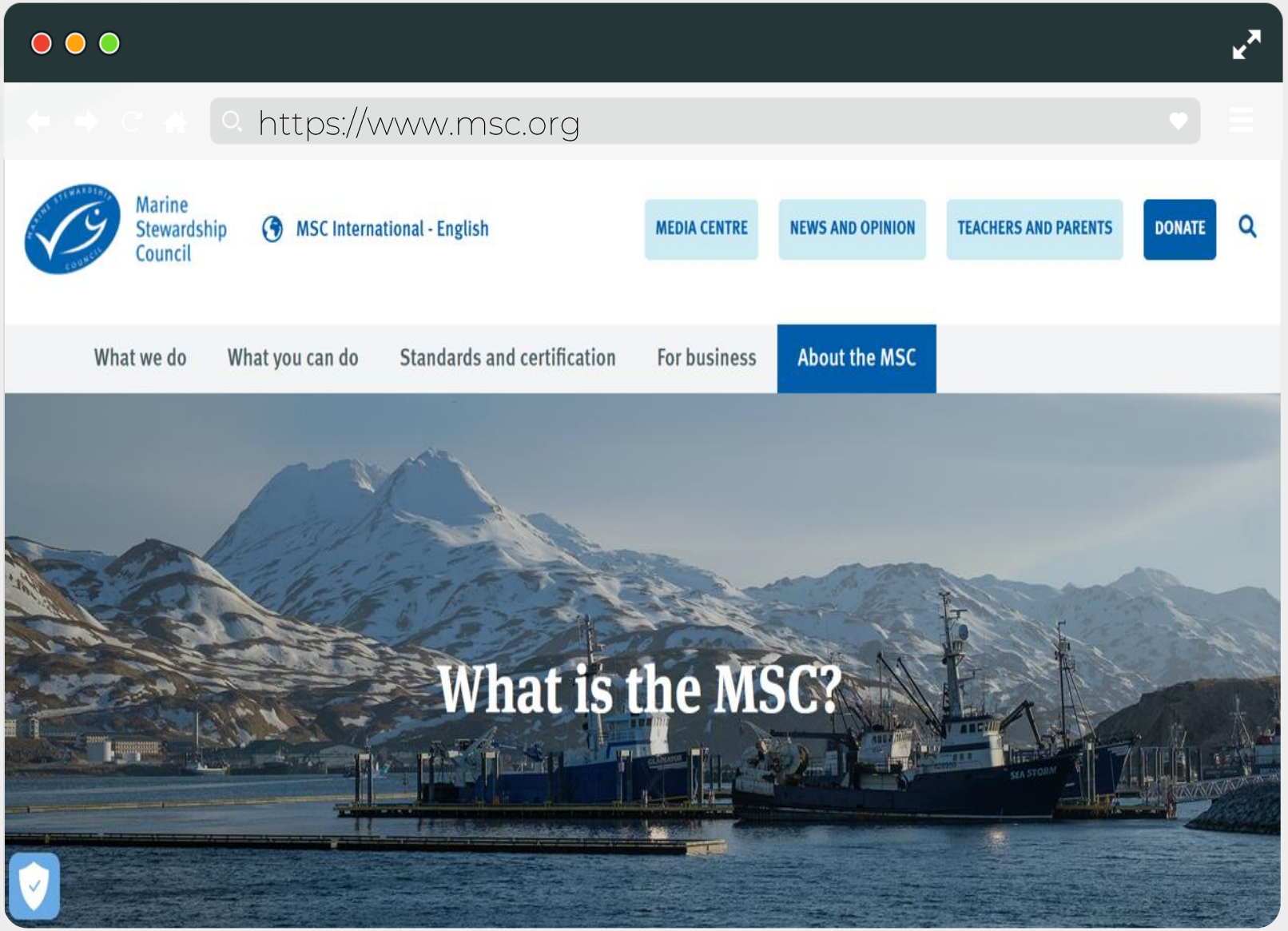
Phase I – Initiation and Planning

Phase II – Identify and Prioritise Issues

Phase III - Develop Management System

Phase IV – Implementation and Monitoring

Achieving Fisheries Sustainability through certification

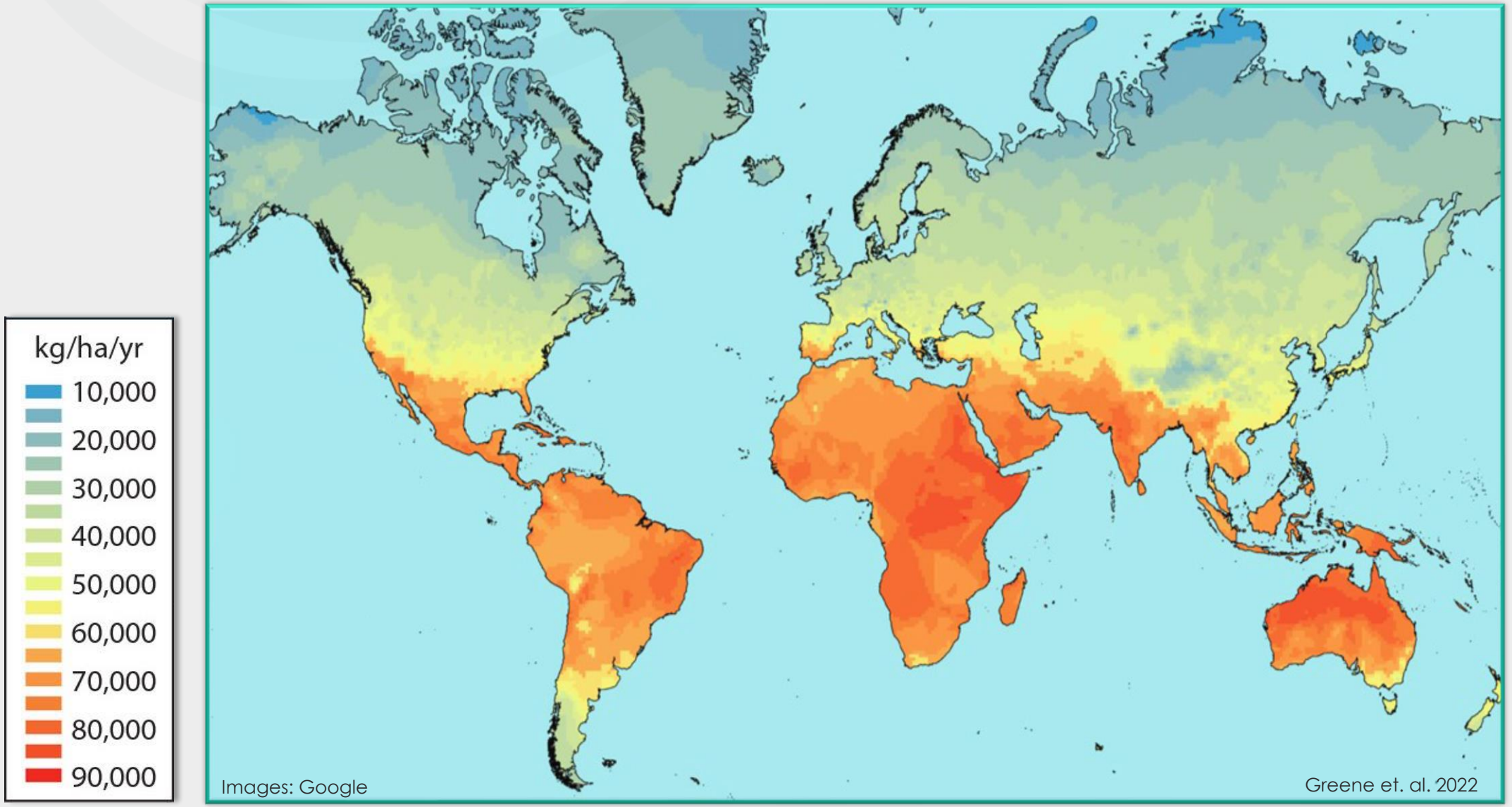


Saudi Arabia as the new worldwide hot spot for large-scale microalgae cultivation

Claudio Fuentes Grünewald, Gabriel Romero-Villegas, Ricardo Gonzalez-Portela, Rahul V. Kapoore, Zain Alammari, Raghdah Malibari, Abdulaziz Aljahdali, Rana Banjar, Emna Mhedhbi, Akram Filimban, Mohamad Padri, Alawi Jifri, Abdullah Alattas, Cristina Barrao, Rawan Nahas, Liliana Alfaro, Majid Bougis, Sama Mohamad, Raghad Alahmadi, Diedrich Vahrenkamp, Yousef Al Hafedh, Ali Al Shaikhi.

Claudio Fuentes Grunewald, Ph.D.
Algae Program Director

Background: Annual Biomass Production

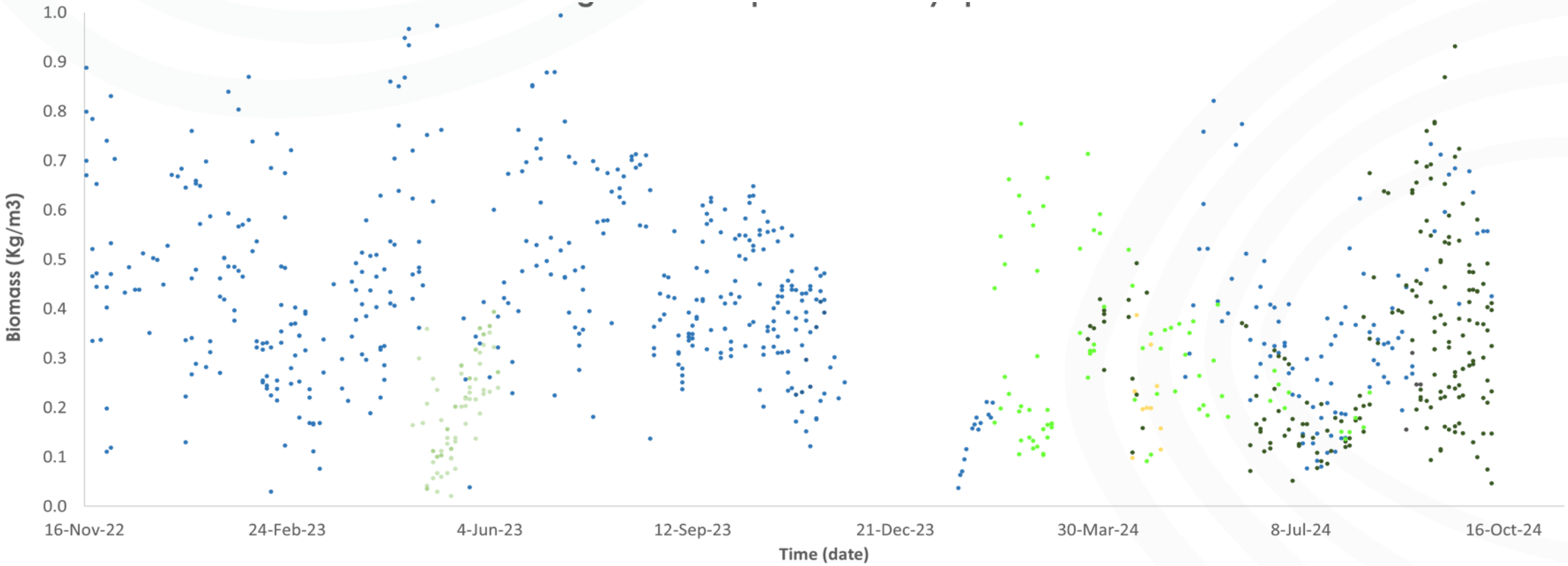


Background: Annual Biomass Production

KAUST-MEWA Industrial/Commercial Size Microalgae Plant

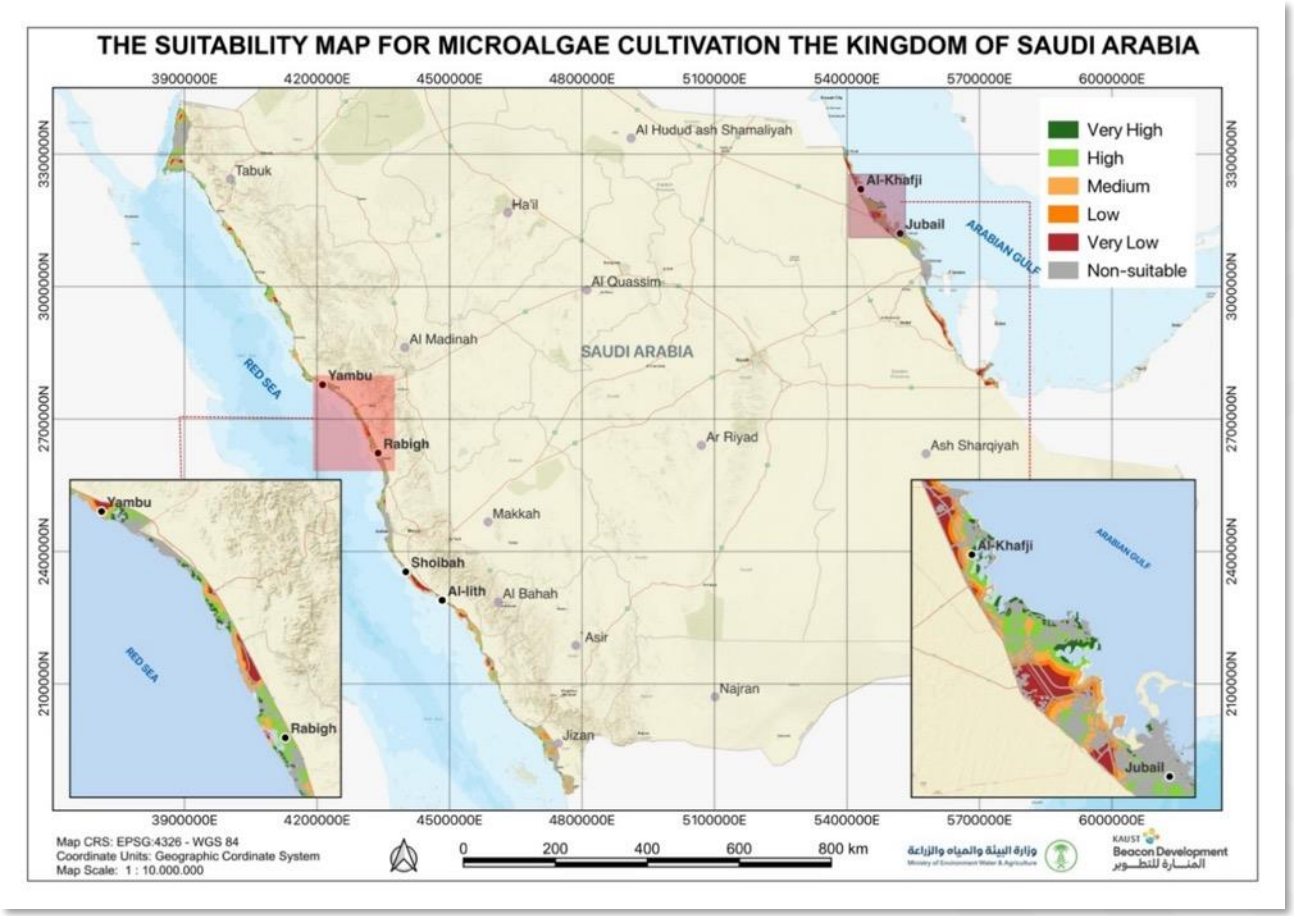
Large-Scale Microalgae Cultivation

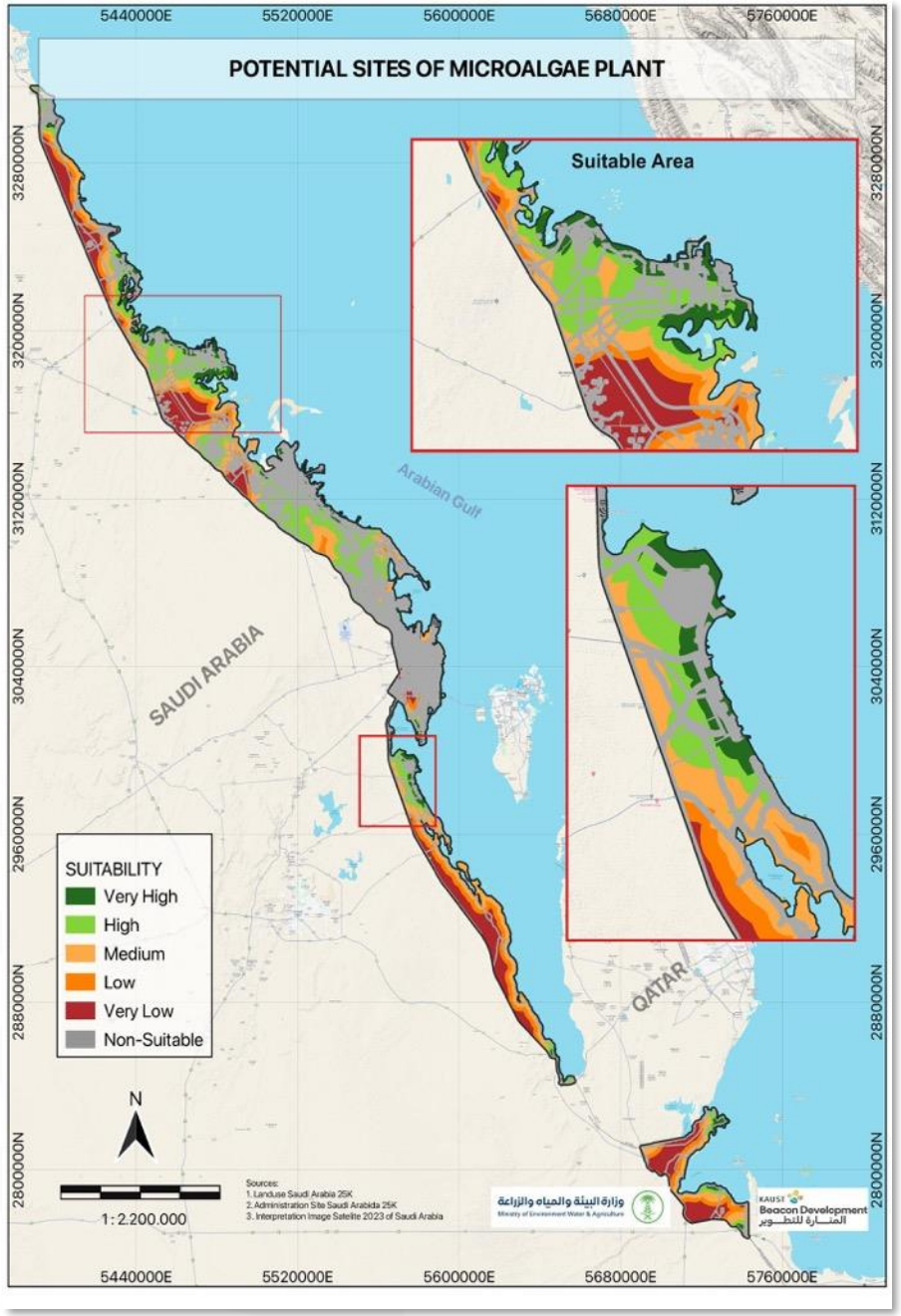
Results: Algal Biomass Production By Species



• *Arthrospira* • *Monoraphidium* • *Leptolyngbya* • *Tetradesmus* • *Chlorella*

Conservative	PROJECTED NUMBERS FOR SAUDI ARABIA	Realistic
3254	Total Plant Volume (m3)	3254
2534	Total Production units only (m3)	2534
25%	% Harvest	25%
0.4	Production at harvest point (Kg/m3)	0.5
814	Volume harvested daily basis (m3)	814
325	Dry biomass harvested daily basis (Kg)	407
7.8	Biomass produced in a monthly basis (tons)	9.8
86	Yearly microalgae biomass production (tons)	**107**
42,200	Phase II total plant area (m2)	42,200
12,724	Phase II plant production area (m2)	12,724
68	Yearly microalgae biomass production per hectare (tons)	**84**
27	Yearly protein production per hectare (tons)	**34**





Categories	Suitability index	Area (km²)	Total (km²)
Non-Suitable	Non-Suitable	10,763	10,763
Suitable	Very low	2,088	14,008
	Low	1,264	
	Medium	4,322	
	High	**4,728**	
	Very High	**1,606**	

Why To Invest In Saudi Arabia For Large Scale Microalgae Cultivation?

- ✓ A country that require algae biotechnology to produce raw material for animal feed
- ✓ The largest country in the Middle East, with vast coastline and empty flat land
- ✓ Over 1,000,000 hectares suitable for the deployment of microalgae biotechnology near the coast
- ✓ One of the highest annual average solar radiation (> 6 kWh/m^2/d); over 325 days of clear sky
- ✓ Cheap energy (Saudi Arabia: 4 cents €; China: 8 cents €; USA: 15 €; Europe: 18 cents € per kWh)
- ✓ Government incentives to attract investors
- ✓ Saudi Food Drugs Authority (SFDA) authorize the use of "Algae", "Algae meal" & "Algal oil" as plant protein to be included in animal feed (SFDA feed 465E)

COME TO GROW ALGAE IN SAUDI ARABIA

Aquaculture Development Program In The Kingdom Of Saudi Arabia

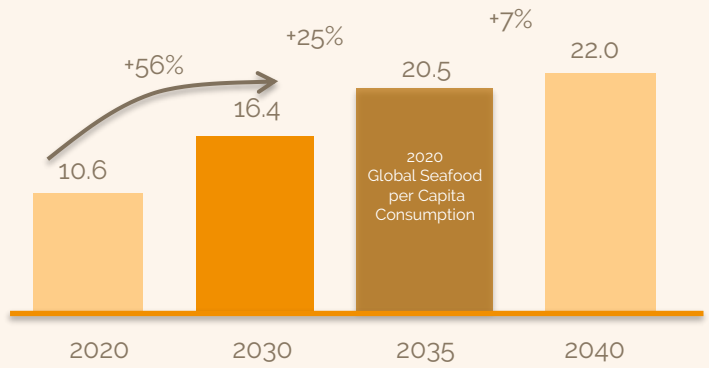
MEWA-KAUST R&D Initiatives

Reda Azam, Ph.D.
Aquaculture Development Program

National Aquaculture Development Strategic Plan

KSA seafood consumption has the potential to reach around ~ 900k MT by 2040

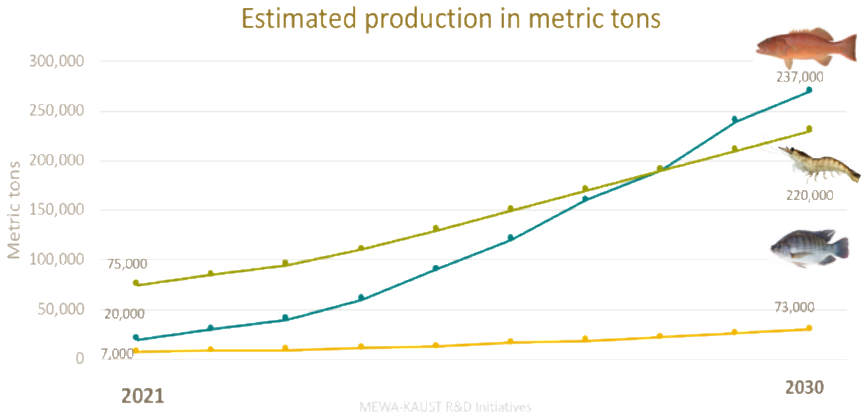
KSA Seafood consumption
(2020-2040, Kg/Capita)



Total KSA Seafood Consumption (MT '000)	354	**648**	847	911
Estimated KSA Population (Millions)	33.4	39.5	41.3	42.7

Saudi Arabia Production Targets For 2030

- ✓ The current production is almost 150 MTn
- ✓ The vision 2030 is to achieve 530 MTn



MEWA-KAUST Strategic Partnership

To support MEWA in achieving its strategic objectives and targets under the Vision 2030 on Environment, Water and Agriculture.
MEWA and KAUST signed the agreement on 2016.

Aquaculture Development Program (ADP)

Inaugural project under the MEWA-KAUST Strategic Partnership to support the development of marine aquaculture in the Kingdom.
Contract was also signed on 09 November 2016.

(ADP): Aquaculture Development Program

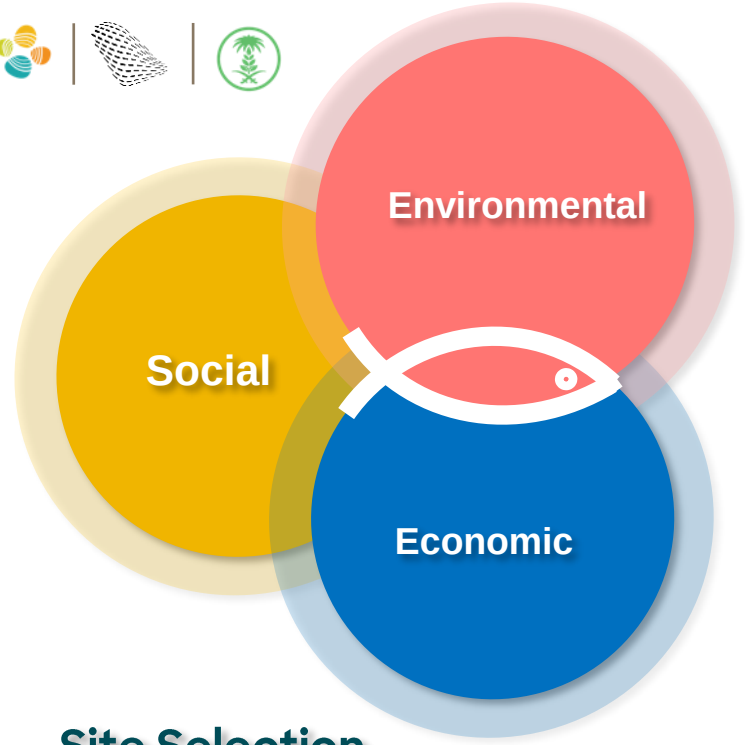
To strategically support the National Program for Developing the Fisheries Sector in the Kingdom of Saudi Arabia towards the goal of 530,000 tons aquaculture production targeted by 2030 vision.

Environment

Nutrition

Hatchery

Breeding



Site Selection

1

2

Ecological Assessment

3

Ecological & Production Capacity

4

SEA / ESIA of Farm Activities

5

Ecological Criteria & Monitoring

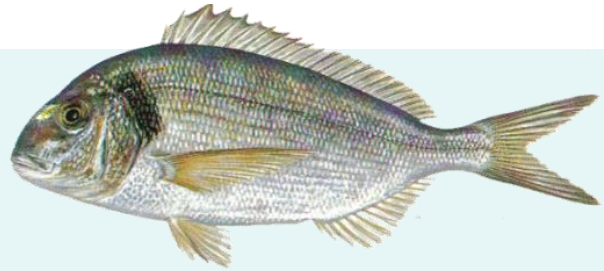
6

Legislation & Capacity Building

MEWA KAUST Fish Nutritional Strategies

1 **Improve feed conversion (FCR) of key existing species**

Asian seabass *Lates calcarifer*



Mediterranean seabream *Sparus aurata*

Sparidentex hasta

Trachinotus blochii

Epinephelus Spp.

Lutjanus argentimaculatus

Seriola dumerili

2 **Develop diets for new species**

3

Adapt nutritional technology for local environments as required

MEWA-KAUST Achievements: FCR & ECR

More than 30+ species-specific feed formulation

Gilthead Seabream

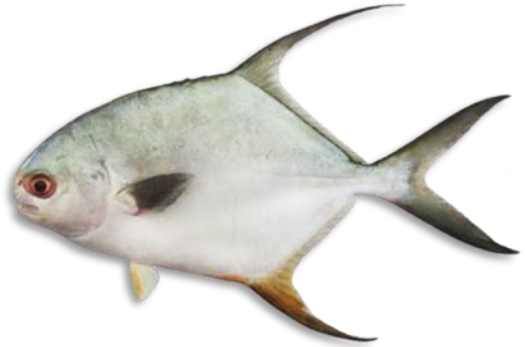
FCR	1.7
FCR Improvement	10%
ECR Improvement	26%

Sobaity Seabream

FCR	1.7
FCR Improvement	12%
ECR Improvement	17%

Asian Seabass

FCR	1.4
FCR Improvement	15%
ECR Improvement	35%



Snubnose Pompano

FCR	1.6
FCR Improvement	13%
ECR Improvement	14%

Hatchery Technology Development

Developed Hatchery Technology

Gilthead Seabream

Sobaity Seabream

Snubnose Pompano

Grouper

Mangrove Red Snapper

Epinephelus Spp.

Investment Opportunities: Technology Available for Species of Interest

Aquafeed

- **530,000** Seafood tons will require **926,000** tons of aquafeed.
- **New Aquafeed Raw materials**; Algae, Insect meal, SCPs (bacteria)..etc.

Hatchery

- **260,000** tons of marine fish, requires **840 million** fish juveniles.
- **250,000** tons of shrimp requires **21** billion of shrimp PL's.
- 70,000 tons of freshwater fish requires **300 million** fish juveniles.

Offshore Cages & Inland Farms

- Sites selected with special investment packages
- Species suitable Environmental assessment package Species-Specific Feed with high efficiency (FCR&ECR)
- Aquaponics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THANK YOU FOR YOUR ATTENTION
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