Lessons learnt from China on the Sustainable Development of Aquaculture and Climate Change

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PROVINCE OF THE EASTERN CAPE

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Dohne Seminars
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Presentation outline

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- Chinese government support programmes to combat climate change

Seminar background

- Three (3) delegates from South Africa attended a Seminar on the Sustainable Development of Aquaculture and Climate Change for countries along the Belt and Road Initiative.
- The seminar was held in the People's Republic of China from the 09th of August to the 29th August 2023.
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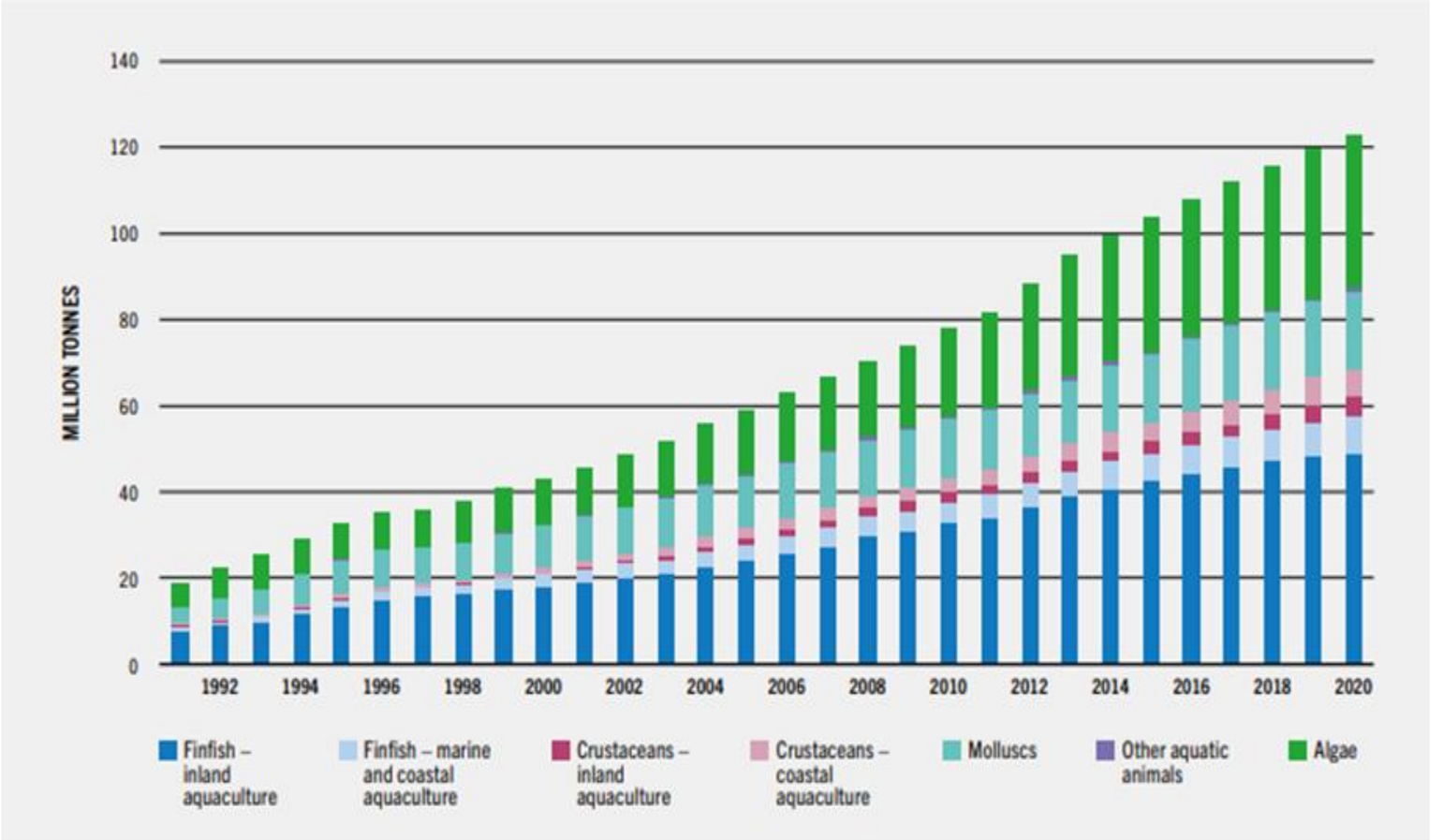
Left: Ms Mmathabo Mogane; Middle: Ms Refiloe Thobejane; Right: Ms Kabelo Manyame

Seminar background (conti…)

- A total of 43 participants from 13 developing countries attended the seminar consisting of various stakeholders in aquaculture, such as government officials, university lecturers, researchers, technicians, extension workers, business personnel and farmers.
- The Freshwater Fisheries Research Center of Chinese Academy of Fishery Sciences gave lectures on various aspects of sustainable aquaculture and climate change.
- Participants of the seminar also went on various study tours.
- The lectures and study tours show cased the success of the aquaculture industry in the China while also highlighting some key lessons to adopt.

Aquaculture globally

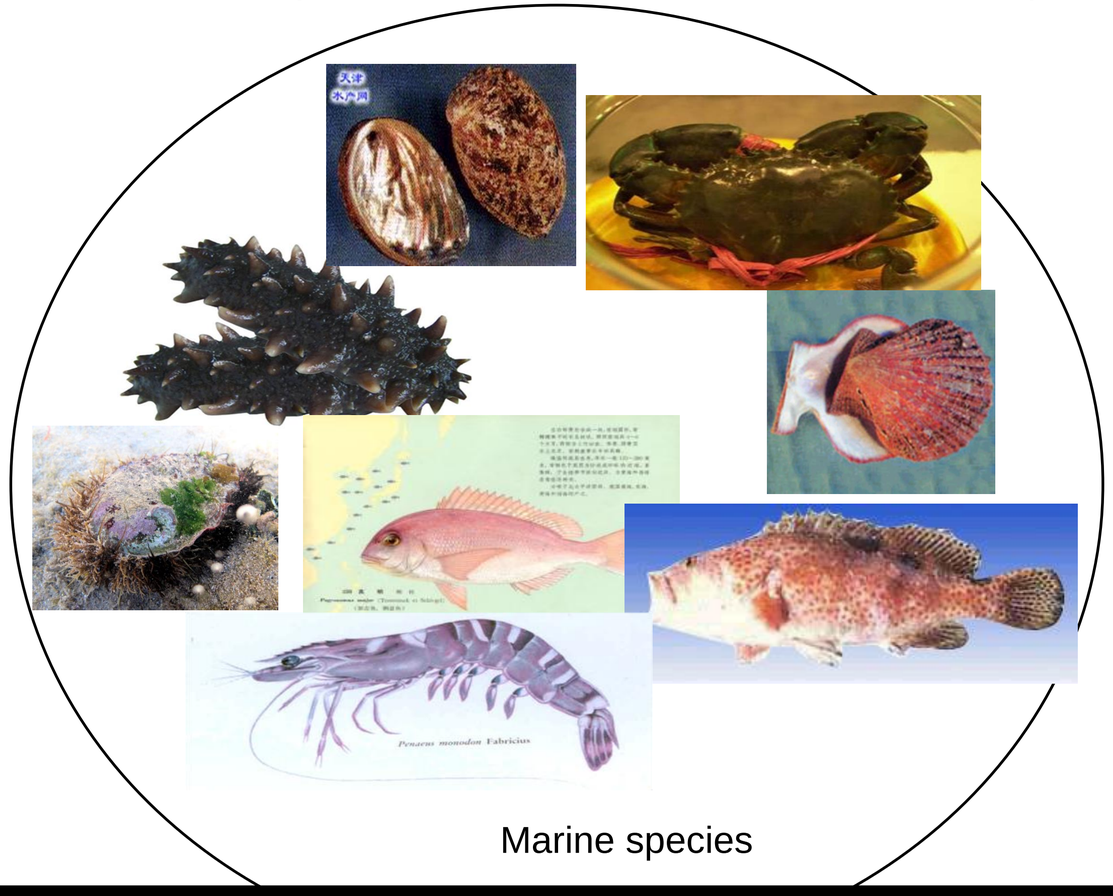
- Globally, aquaculture remains one of the fastest-growing food producing sectors.
- If responsibly developed and practiced, aquaculture can generate lasting benefits for global food security and economic growth.
- In 2020, the total global aquaculture production was 125 million tons, of which 49,90 million tons was produced by China while South Africa produced 6 045,97 tons.



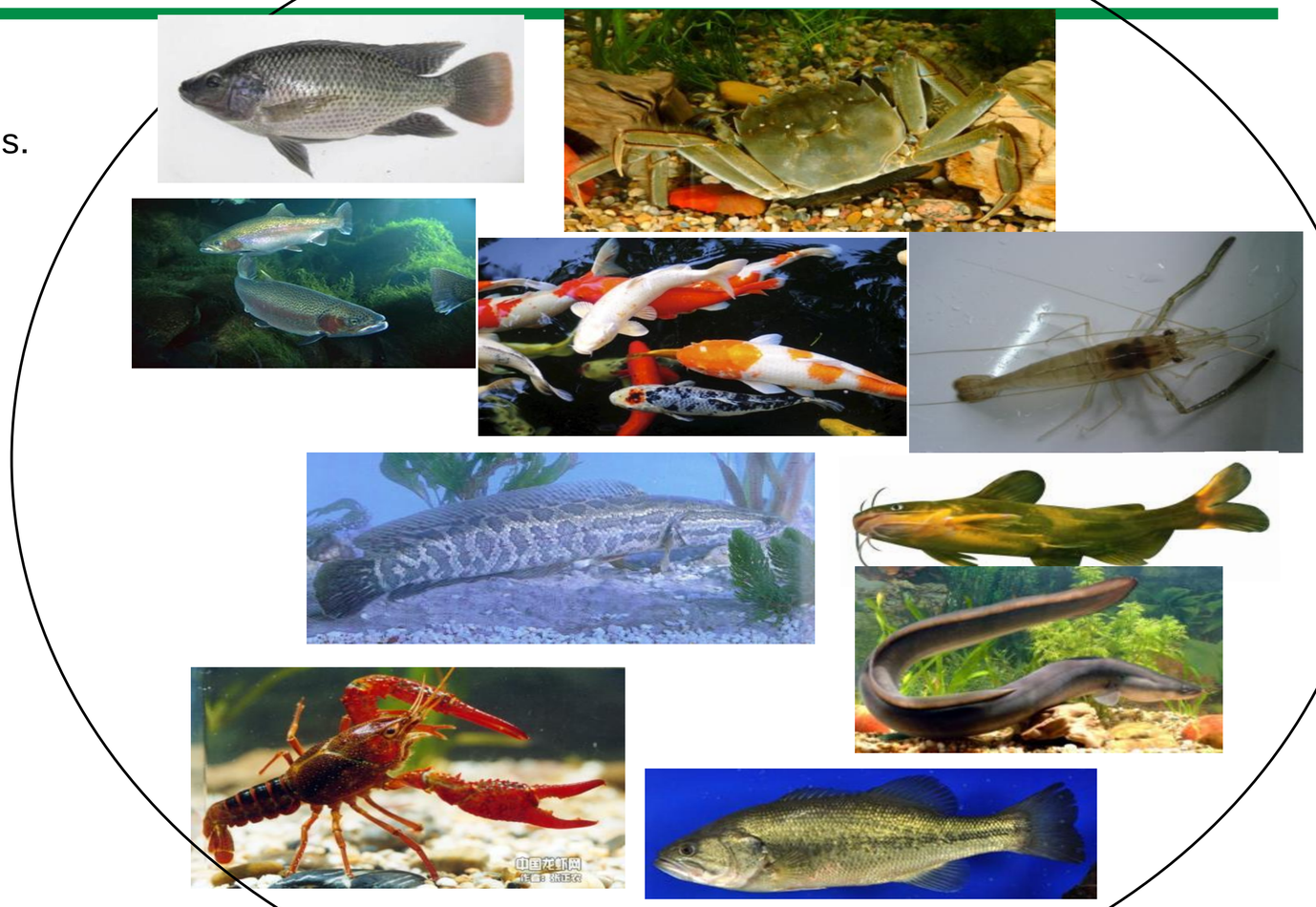
Aquaculture production globally (FAO 2022)

Aquaculture in China

- China is the world's largest aquaculture producer.
- The country farms a variety of freshwater and marine species.



Marine species



Freshwater species

Aquaculture Production Systems

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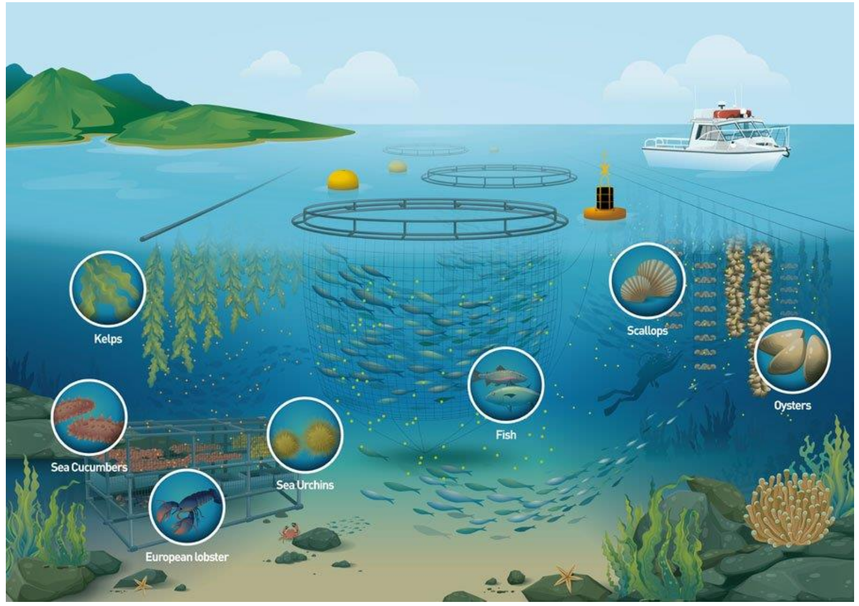
- China uses a variety of production systems such as ponds, cage and pens; recirculating aquaculture systems, longlines and floating rafts.

Types of Integrated Aquaculture Systems

- Integrated fish farming is a system that produces fish in combination with other agricultural products.

- The country uses systems such as the rice-fish farming system; aquaponics; and Integrated Multi-Trophic Aquaculture.



Climate Change Impacts Associated Weather Abnormity and Calamities on Aquaculture

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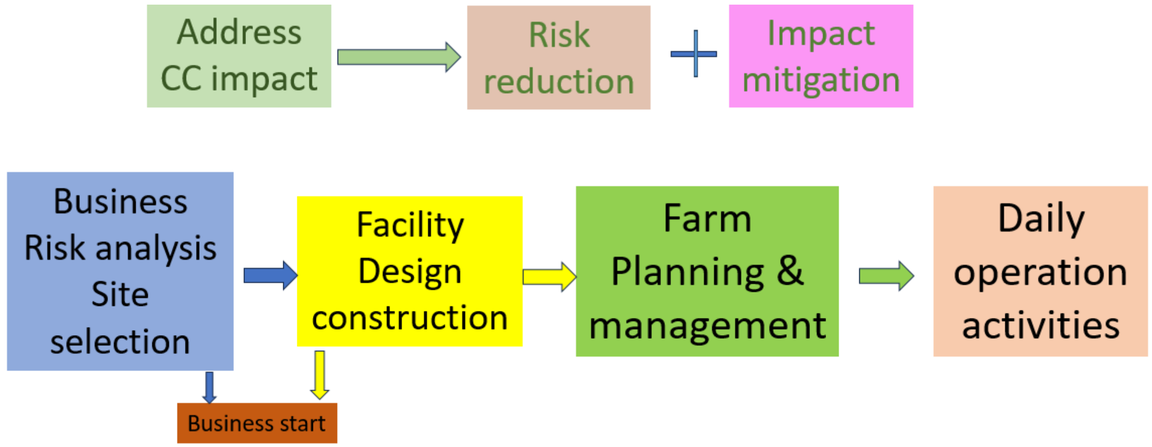
- The aquaculture sector is highly dependent on natural resources and environment conditions, water quality such as temperature, dissolved oxygen, pH,etc.
- Abnormally long dry seasons and severe drought leads to the shortage of water supply.
- Heavy rainfall during nighttime in hot summer results to the vertical mixture of water, thus lowers the dissolved oxygen in the entire water body. This results to the suffocation of cultured organisms and mortalities.
- Low oxygen level causes the saturation concentration of oxygen in water to decline as water temperature increases.
- Extended heat wave results in high water temperature (exceeds optimal temperature, thus retarded growth and mortalities).
- On the contrary, extreme cold/snowstorm in winter causes rapid temperature drop which also results in mortalities.
- Abnormal low temperature in spring can even delayed sexual maturation of broodstock which affects seed production.
- Water parameters not within the optimal range of organisms cause frequent disease outbreaks.
- Eutrophication due rainfall into water bodies can cause red tide which are toxic algae bloom and fatal to molluscs and other animals.
- Climate change impacts have a detrimental effect on farm operations and causes massive financial losses.

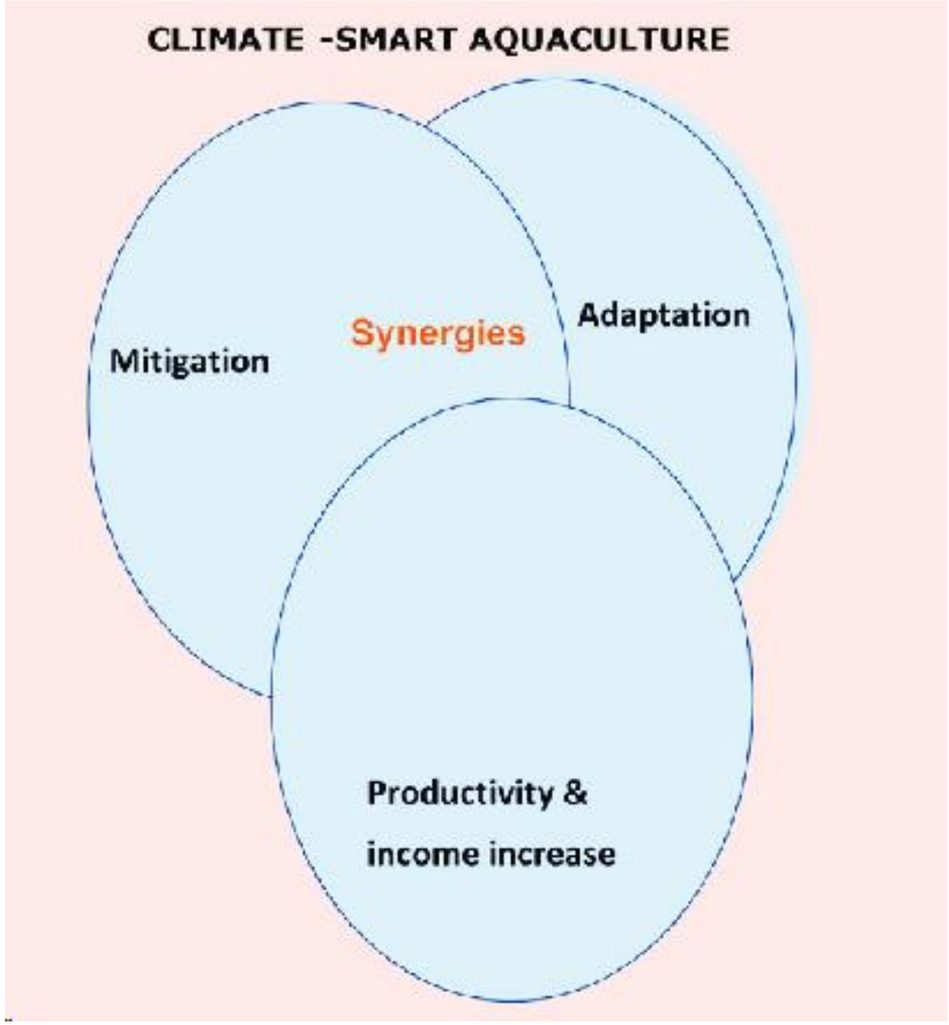
Climate resilient aquaculture practices at farm level

- An approach to adopt to be resilient to climate change impacts.



Climate Smart Farm Management Practices

- Good disaster preparedness in farm management.
- Mind-set change and knowledge enhancement on specific measure to cope with specific climate change impacts.
- Closely monitoring weather forecasting (particularly long-medium term) and early warning of weather calamities, planning responses well ahead;
- Selection of climate smart culture models and cropping pattern.
- Adjust production cycle, long-season crop vs. short-season crop, stocking size change.
- Crop timing, avoid high risk season if possible.
- Appropriate market planning, marketing time, mood of transportation.



Good selection of aquaculture species and diversification

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- Different aquatic animal species with different biological attributes, adaptability to environmental changes.
- Select species with tolerance to wider range of environmental parameters, i.e wide range of temperature, low dissolved oxygen, high salinity (marine aquaculture).
- Select species with relatively short culture period for marketable size.
- Select species not dependent on wild seed or broodstock.
- Diversification of culture species to reduce the impact, i.e, shrimp species with different salinity tolerance for rice-shrimp farming in coastal areas*, Macrobrachium* for rainy season, giant tiger prawn for dry season in Vietnam;
- Tropic finfish/catfish (such as tilapia) for warm season and temperate species (such as carps) for low temperature season.

Chinese government support programmes to combat climate change in aquaculture

- The Chinese government has various programmes in place to support farmers and be resilient to climate change impact.

- The programmes includes the following, but not limited to these:

  - Policy and strategy supporting climate resilient aquaculture;
  - Public investment in improvement of infrastructure helping farmers addressing climate change;
  - Economic and financial assistance to farmers in addressing climate change impacts;
  - Strengthened technical support to farmer in mitigating climate change associated impacts; and
  - Improved public services to support farmers in addressing climate change impact.

THANK YOU!!

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