



Federal Ministry
of Food
and Agriculture



Fraunhofer
EMB



Gesellschaft
für Marine Aquakultur

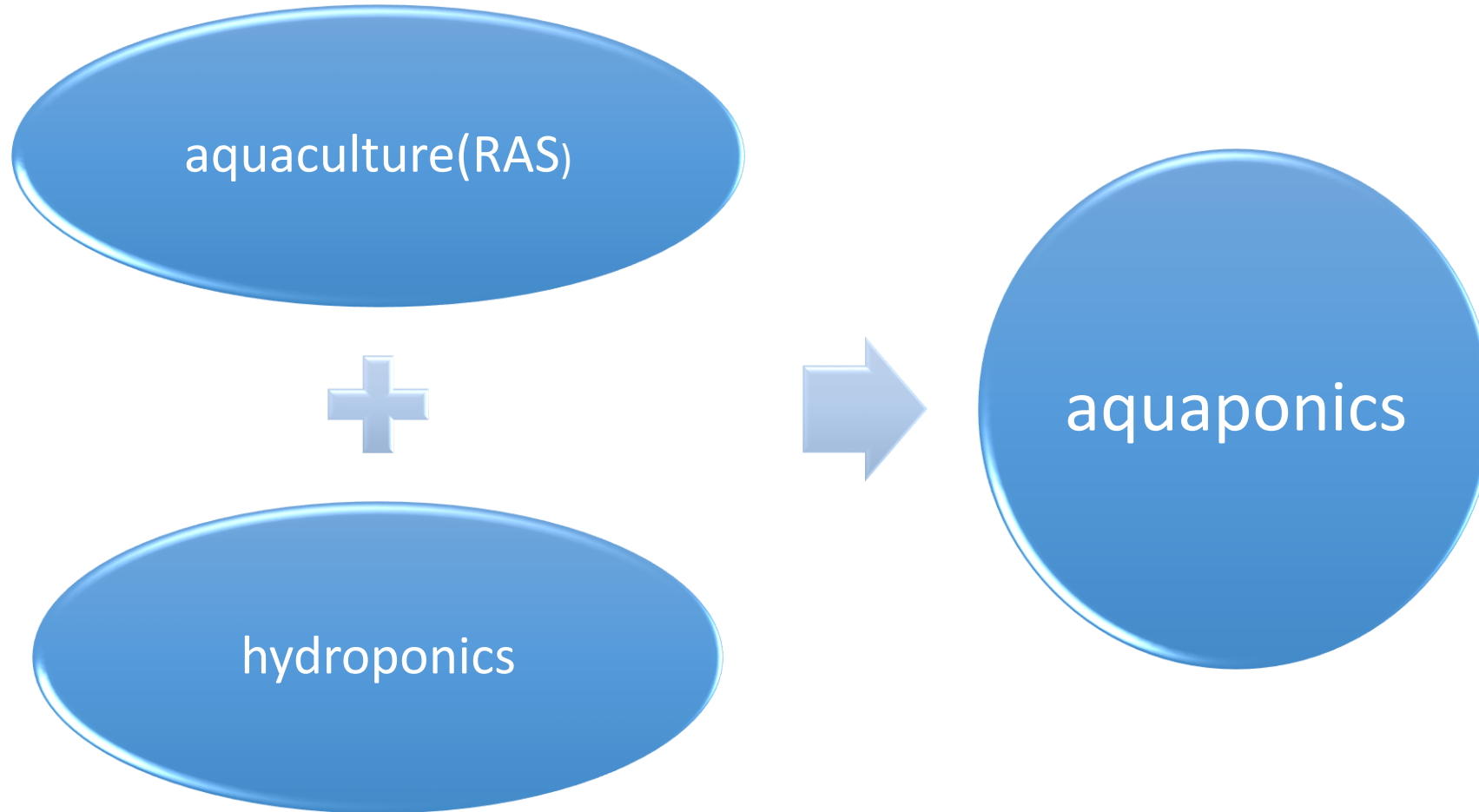


ICH- LIEBE -FISCH | I LOVE FISH PROJECT

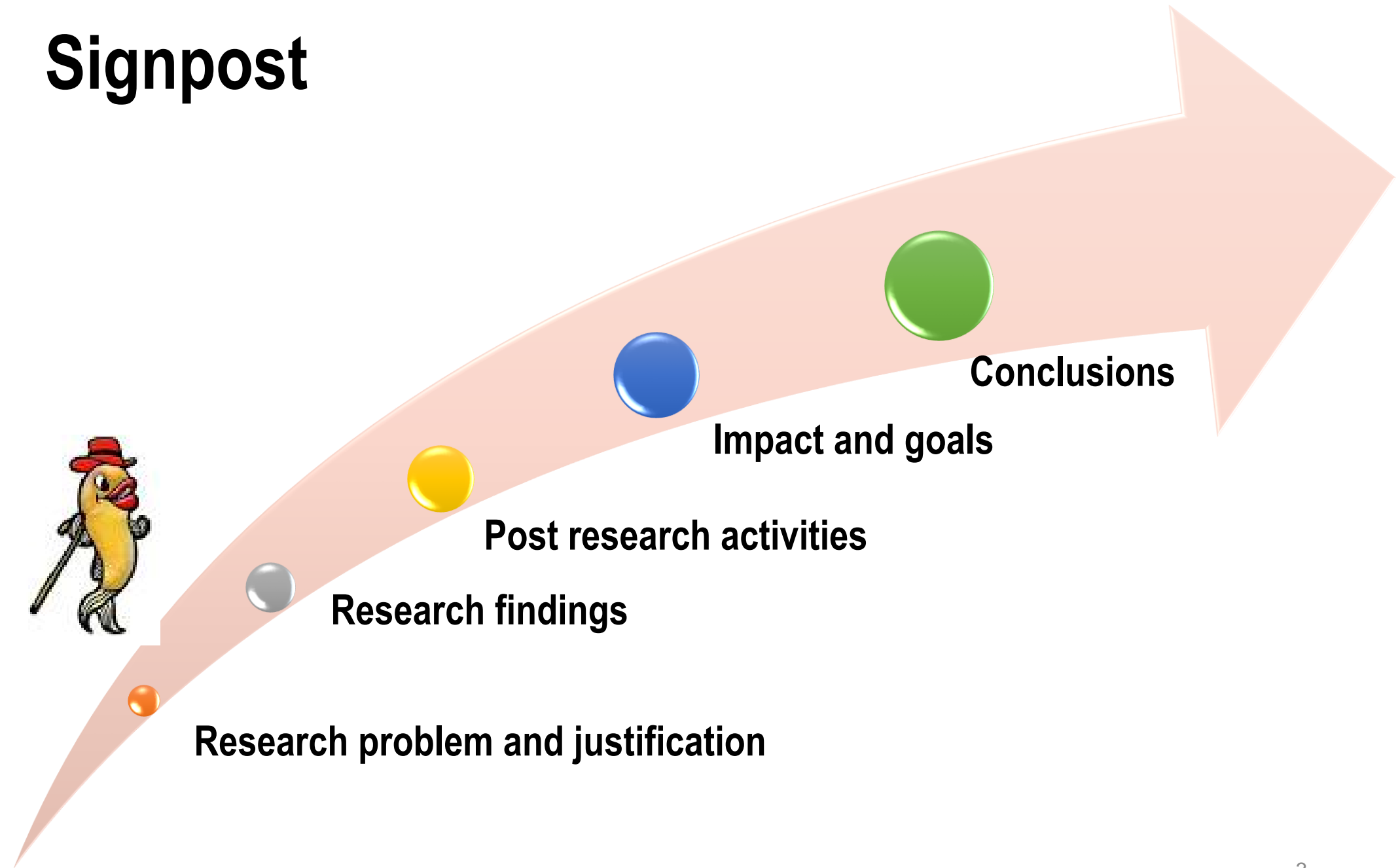
AQUAPONICS SYSTEMS

PEACE CHEMIS MNELEMBA

AQUAPONICS?



Signpost



Why Aquaponics



Over-consumption and overpopulation underlie every environmental problem we face today” — Jacques Cousteau....

The diagram consists of three circles arranged horizontally. The leftmost circle is dark blue and contains the word 'Intensification' in white italicized text. The middle circle is light blue and contains the text 'Vs' in white. The rightmost circle is dark blue and contains the word 'Sustainability' in white italicized text. A thick blue curved line starts from the bottom of the middle circle and curves downwards and to the right, ending under the right circle. The words 'Blue Revolution' are written in black text within this curve.

Intensification

Vs

Sustainability

Blue
Revolution

THE WARM HEART OF AFRICA



- Food security
- Nutrition and health
- Urbanization and land pressure
- Water scarcity in urban areas
- Electricity

GOALS!!!

- Year round production
- Independent from grid
- Using marginal land
- Minimal water input...



Research Findings



Summary of growth rates in Barreaponics

STOCKING		HARVEST		GAIN	
Rate	200fish m ⁻³	Mean Weight	33.02 g fish ⁻¹	AGR ^a	0.35 g/day
No. of Fish	50	Minimum	25 g	SGR ^b	1.77 %day ⁻¹
Mean Weight	10.86 g fish ⁻¹	Maximum	45 g	FCR ^c	1.55
Minimum	8.8g	Total weight	1.651 Kg	Total gain	1.101 Kg
Maximum	12.9g	Survival rate	100%	Mean gain	22.16 g
Total weight	0.55 Kg	Culture Period	63 days	Total Yield	1.651 Kg

Lettuce growth in a 42 day trial

Parameter	Mean no. leaves	Weight/head (g)	Mean breadth (cm)	Mean height (cm)
Planting	3	10	2	3
Harvest	7	504	13.33	27

Revenue extrapolated to 1 year

Produce	Yield (kg)	Selling Price/kg (MK)	Revenue (MK)
Fish Yield	9.906	3500 (\$4.67)	34671 (\$46.23)
Lettuce Yield	87.276	2300 (\$3.06)	200734.8 (\$267.65)
Total			235405.8 (\$313.87)

Gross profit ratio

	2 Months	6 Months	Year
Sales revenue ^c (MK)	34611.5	107301.6	235405.8
Gross profit ^b (MK)	13820.7(\$18.4)	44929.2(\$59.9)	110661(\$147.5)
Gross Profit Margin Ratio ^a (%)	39.9	41.9	47.0

The payback period

Present Value Method	Year	Profit Increment Rate	Gross Profit (MK)
	1	1	173039.2
	2	1.1	190343.1
	3	1.15	218894.5
	4	1.2	262673.4
			844950.2 (\$1126.60)
	Payback period (years)	3.8	
Cash flow method	Payback period	4.4	

Productivity for Barrelponic system

FISH

- Total fish yield per year at 200fish/m³ is 9.906Kgs
- That's a productivity of about 50kgs per cubic meter per year
- Total fish revenue is K34,671 (\$46.23)

Lettuce

- Total lettuce yield per year is 87.276 kgs
- That's a productivity of about 87kgs/m²/yr compared 41 and 3.9 kg/m²/yr from hydroponics and conventional farming, respectively. (source: comparison of land, water, and energy of lettuce grown using hydroponic vs conventional agriculture methods, published in June 2015 by the international Journal of environmental research and public health).
- Total lettuce revenue is K200,734.8 (\$267.65)

Observations

- Investment costs would significantly reduce if some materials can be purchased locally
- lettuce is contributing over 85% from the sales percentage and production while fish contributes less than 15%

Recommendations

- More research should be done in the aquaponics fish component especially in the areas of feed, and water temperature to ensure 50% return contribution.

Post-research activities

- Bunda aquaponics system
- Benga aquaponics system

Bunda system under construction







System completed



Salad growing



Weight blow



Benga system



Benga system under construction



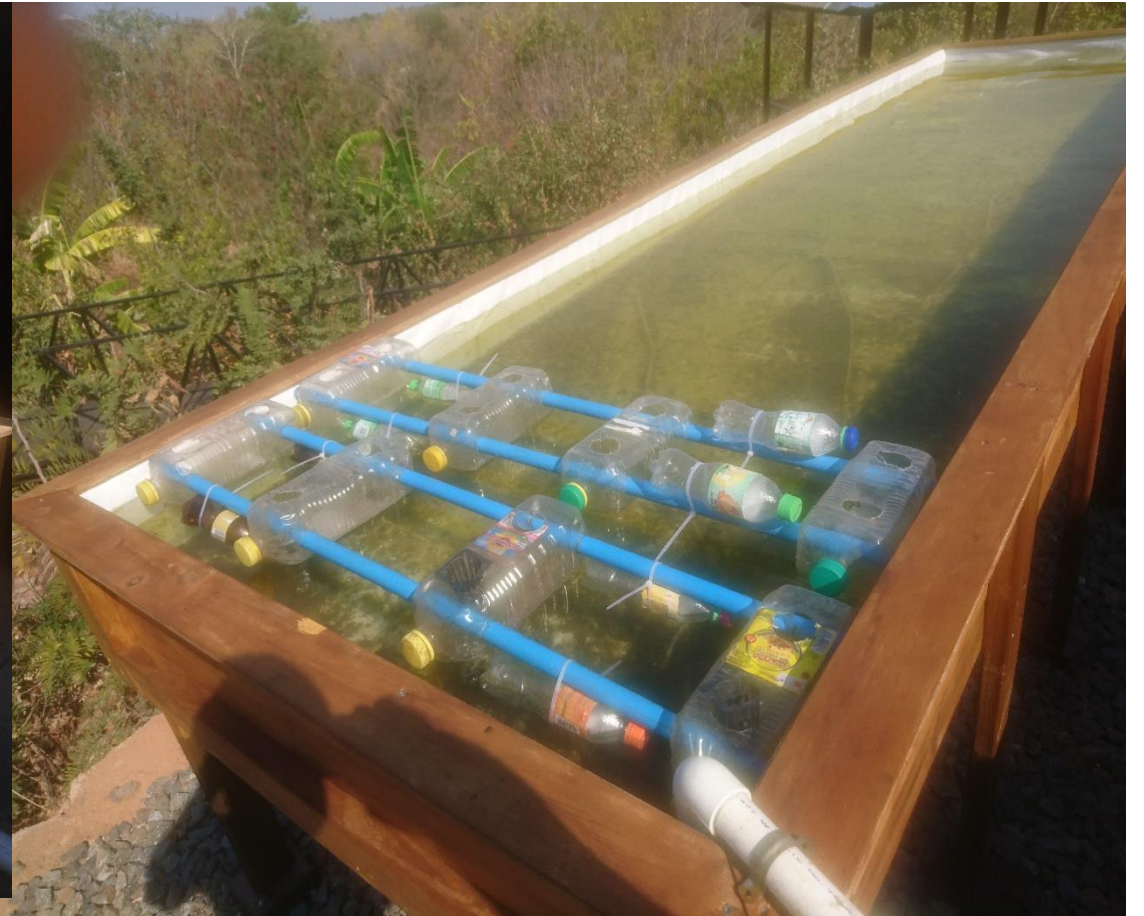
Pebble production



Job creation and Women participation



Modified DWC



Current status and needs



AQUAPONICS SHORT COURSE

19th – 21st JUNE 2019

LUANAR- Bunda Campus

Aquaponics immediate impact



impact





RECOMMENDATION

- More training on aquaponics
- Reach out to urban farmers who have capacity to invest
- Tackle fish feed problem to increase peoples willingness to venture into aquaculture industry

Thank you!