



Achieving household food security by producing vegetable through Sprouting and Aquaponic

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Agenda

Linkage between Agri-food chain & wellbeing

Self-sustaining food production

- Sprouting
- Aquaponic

Suggestion

Linkage between Agri-food chain & wellbeing : Problems?

Growers

Seed, Fertilizer

Processors & Distributors

Raw materials, Packaging

Chemical, Material, Equipment
Labor, Land, Water, Energy

Consumers

↑ Elderly & Urban populations
↑ Health problems & Health care cost

↓ Food Security
- availability, accessibility, utilization
↓ Environmental Security

Production → **Processing & Marketing** → **Consumption** → **Poor Wellbeing**

Natural resources degradation

Soil	Water	Biodiversity	Climate
depletion, degradation & desertification	depletion, contamination & eutrophication	lost of plant & animal diversity	global warming- storm, drought, flood, fire, etc.

Changes in growing season and area, reduced harvest and yields & need for higher input

Growers

New varieties
- High yield
- High quality
- High phytochemical

Green technologies
- Use less input

Processors & Distributors

New products
- Taste Health & Convenience

Green packaging

Green technologies
- Use less input

Consumers

↑ Elderly & Urban populations
↑ Health problems & Health care cost

↑ Food Security
- availability, accessibility, utilization

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Food education | Variety of healthy foods | Self-sustaining in household food

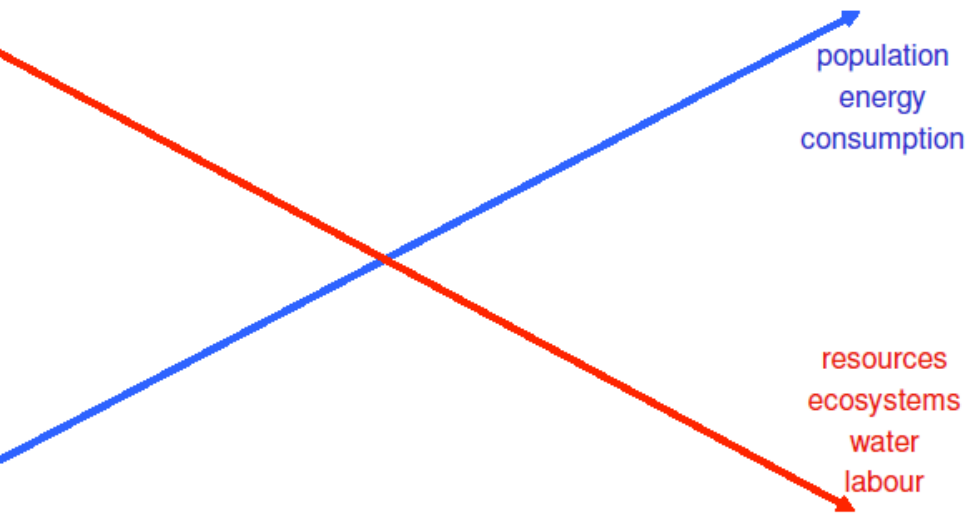
Sustainable Production → **Sustainable Processing & Marketing** → **Sustainable Consumption** → **Wellbeing**

Reduced natural resources degradation→ Mitigate climate change

Reduced energy use, reduced water use, & reduced landfill

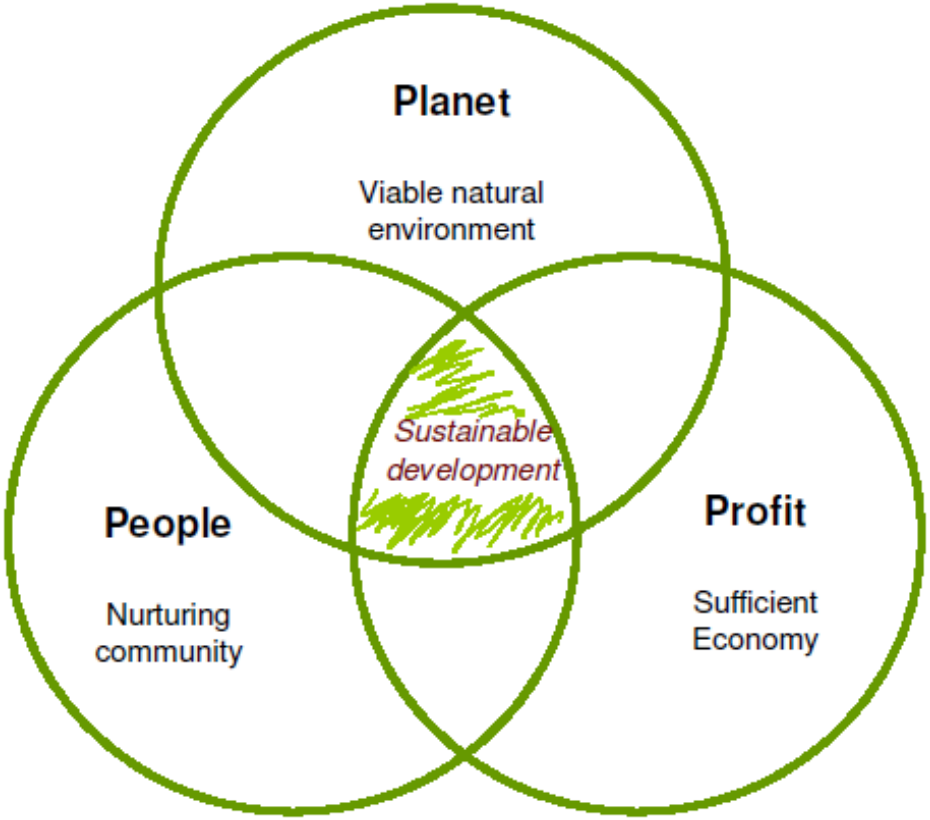
Soil conservation, Efficient water use, Agrochemical restriction & Biodiversity protection

The issue



We will need to produce more, with less…

Balance



Source: Innocent Fruit Team Presentation. 2011. Our approach to sustainable ingredients. Agriculture Abroad Footprint Forum. *23 November 2011*. Fruit Towers. UK.

Self-sustaining (Low cost low input) food production at home: Sprouting

Nutritional Value of Sprouts

Raw Sprouts (1 cup)	Calories	Protein (grams)	Fiber (% Daily Value)	Vitamin C (% Daily Value)	Iron (% Daily Value)	Folate (% Daily Value)
Alfalfa	10	1.3	3	5	2	3
Mung Bean	26	2.5	4	23	4	9
Radish	16	1.4	n/a	18	2	9
Soybean	86	9.0	3	17	8	30
Wheat	214	8.0	4	5	11	10

(Source: U.S. Department of Agriculture)

Self-sustaining (Low cost low input) food production at home: Sprouting

Researchers at Johns Hopkins University School of Medicine

Broccoli sprouts rich in Sulforaphane Glucosinolate (SGS) may reduce risk of cancer, high blood pressure, cardiovascular disease and stroke

Rota-tech sprouting system

20 oz = 569 g

1 oz = 28 g

ที่มา: 1. www.amazon.com/Sproutamo-Easy-Sprout-Sprouter, 2. www.amazon.com/Bioset-Seed-Sprouter, 3. www.amazon.com/EasyGreen-Clear-Sprouter-Easy-Green, 4. www.sproutnet.com/rota-tech_sprouting_system.htm, 5. www.xymogen.com 6. www.enduracell.com, 7. www.cellfeast.com, 8. www.brassicatea.com, 9.www.brassica.com, 10. www.theculturedcook.com, 11. www.flickr.com/photos

Self-sustaining (Low cost low input) food production at home: Sprouting

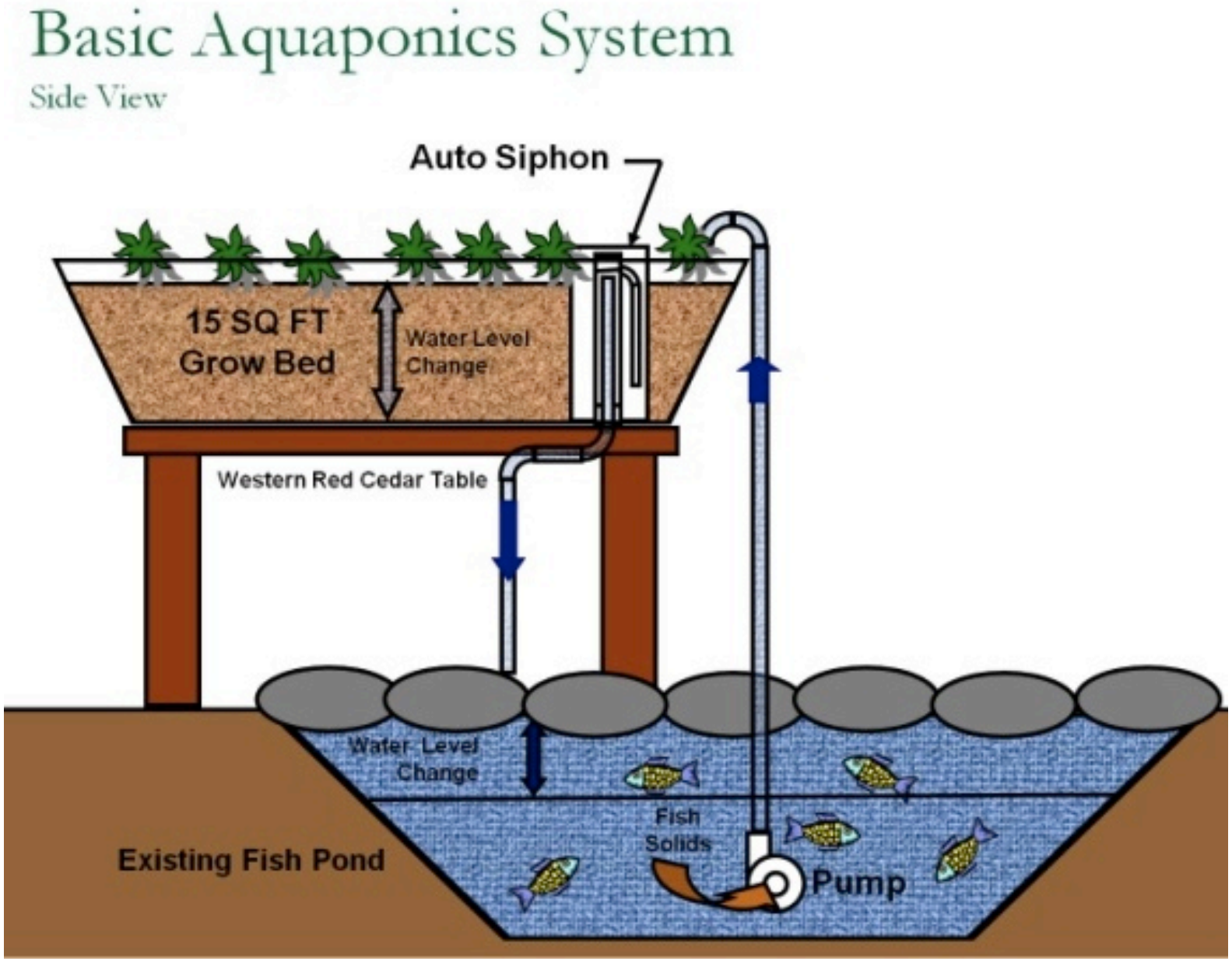
Jamie Oliver Grow Your Own Products

Source: www.wowmicroleaf.co.uk/how-it-s-grown and www.freshplaza.com/news_detail.asp?id=77826

Self-sustaining (Low cost low input) food production at home: Sprouting

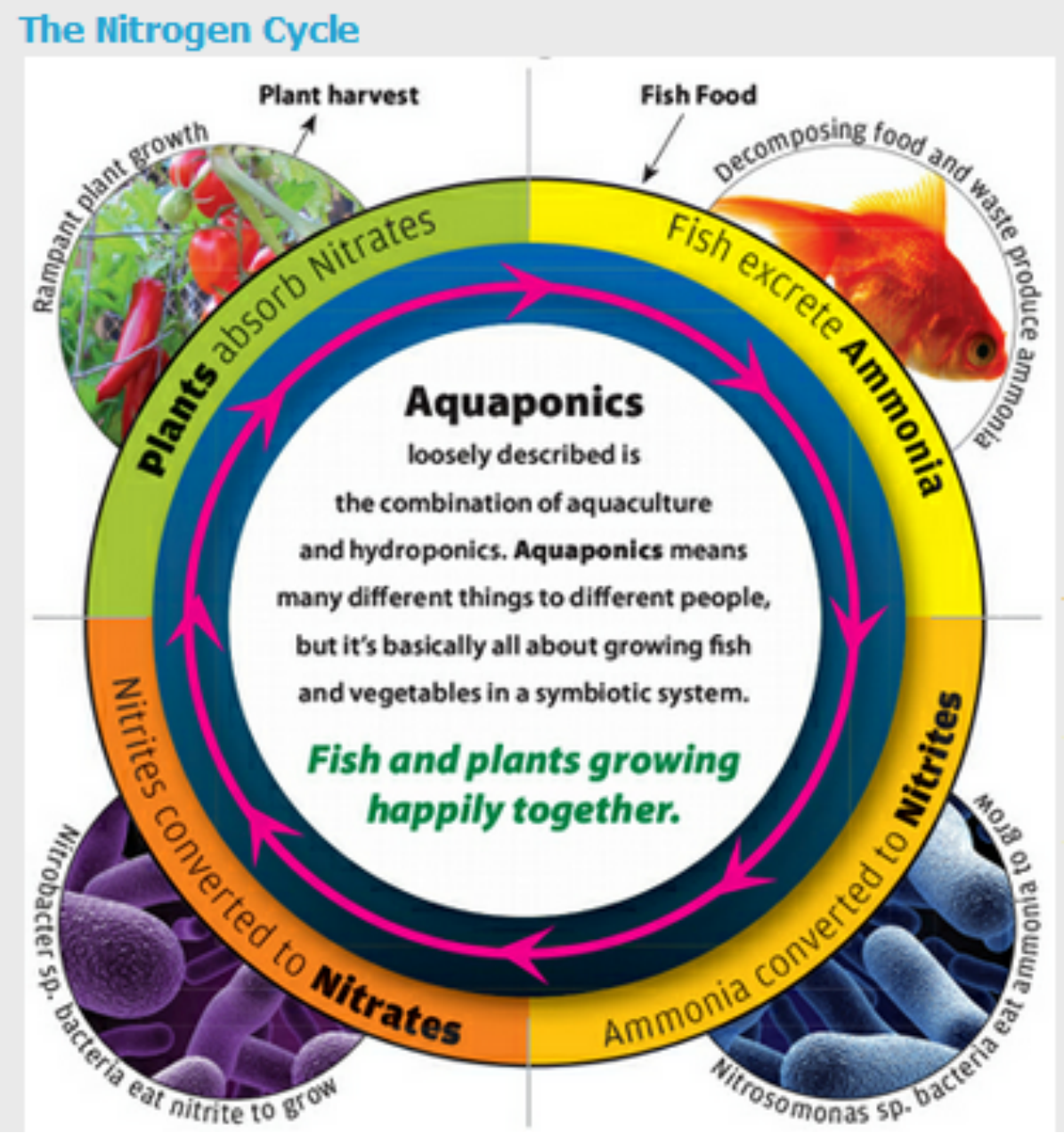
Source: 1. www.theculturedcook.com/wp-content/uploads/2009/03/ 2. www.flickr.com/photos/princess_of_llyr/218097426/ 3.www.brassica.com, 4. www.flickr.com/photos/maangchi/3757816831/

Self-sustaining (Low cost low input) food production at home: Aquaponic



Source: DIY Aquaponics Workshop Presented By Sue Spray, 2010

Self-sustaining (Low cost low input) food production at home: Aquaponic



Source: www.backyardaquaponics.com/information.html

Self-sustaining (Low cost low input) food production at home: Aquaponic

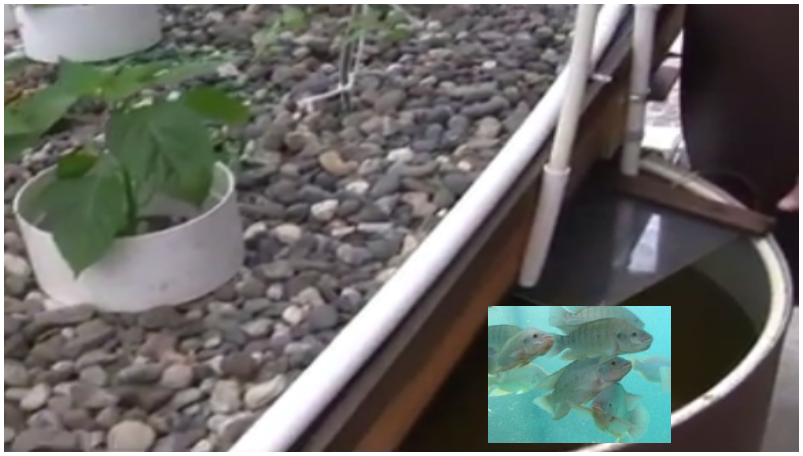
Backyard AQUAPONICS
Bringing food production home

Figure 2: A small system, built using recycled barrels (Hughey, 2005).

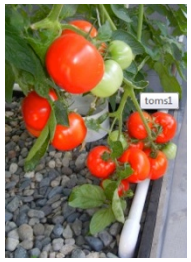
Figure 3: A commercial-sized raft aquaponics system (Rakocy, Masser, & Losordo, 2006)

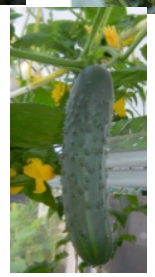
Source: Optimization of a backyard aquaponic food production system. www.backyardaquaponics.com/Travis/Aquaponics-Desigh.pdf

Self-sustaining (Low cost low input) food production at home: Aquaponic



http://portablefarm.com





http://backyardaquaponics.com/forum/viewtopic.php?f=18&t=1622

www.backyardaquaponics.com/systems/150-shedleys-system.html

Self-sustaining (Low cost low input) food production at home: Aquaponic

Self-sustaining (Low cost low input) food production at home: Aquaponic

low-tech, low-cost kits for the developing world.

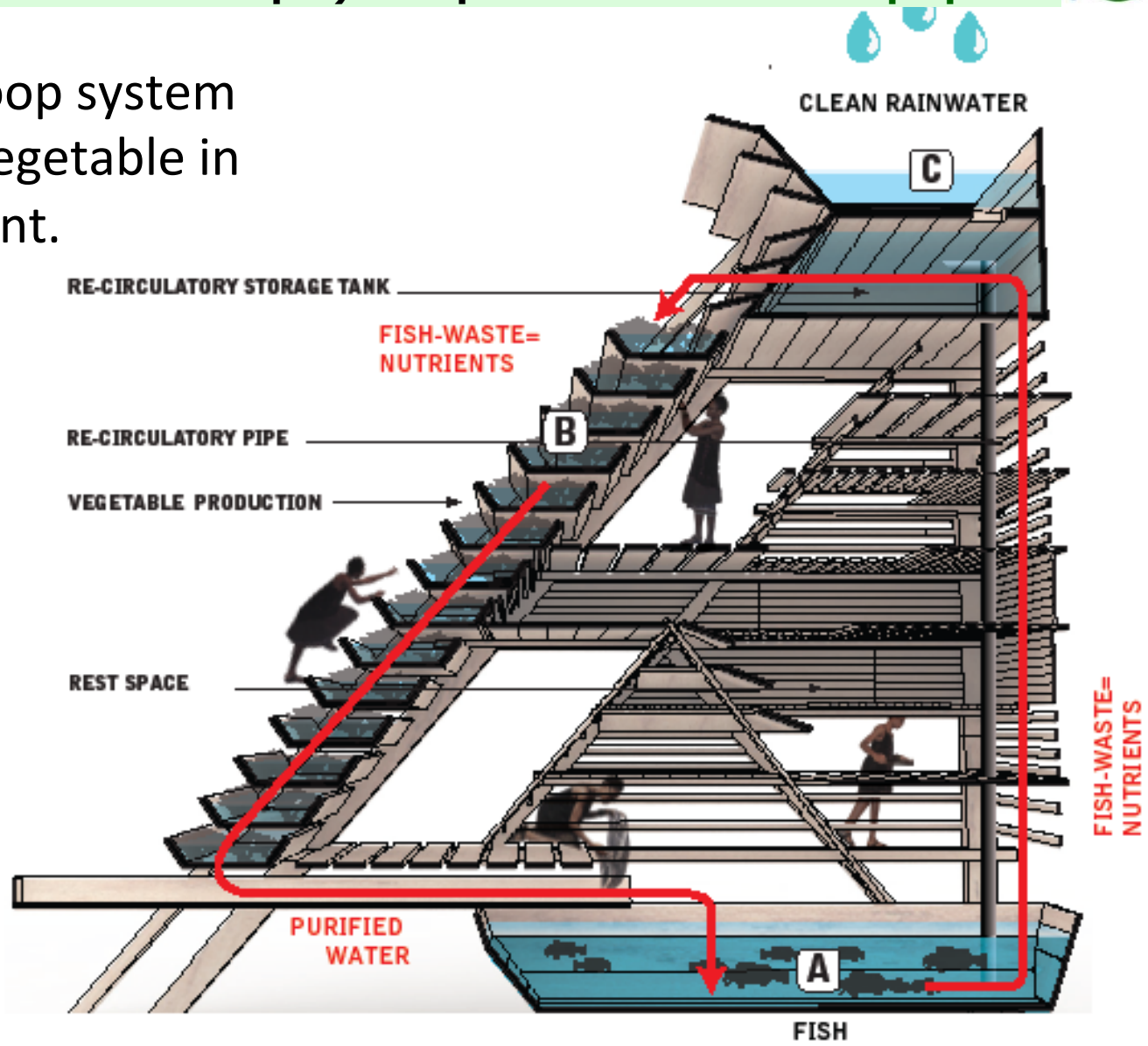
MAA-BARA: CATALYZING CHANGE IN NIGERIA'S NIGER DELTA

by Ogheneruno .E. Okiomah Master of Architecture Thesis, MIT, USA
Submitted to the Department of Architecture on January 18, 2011

http://dspace.mit.edu/bitstream/handle/1721.1/63053/722952583.pdf

Self-sustaining (Low cost low input) food production at home: Aquaponic

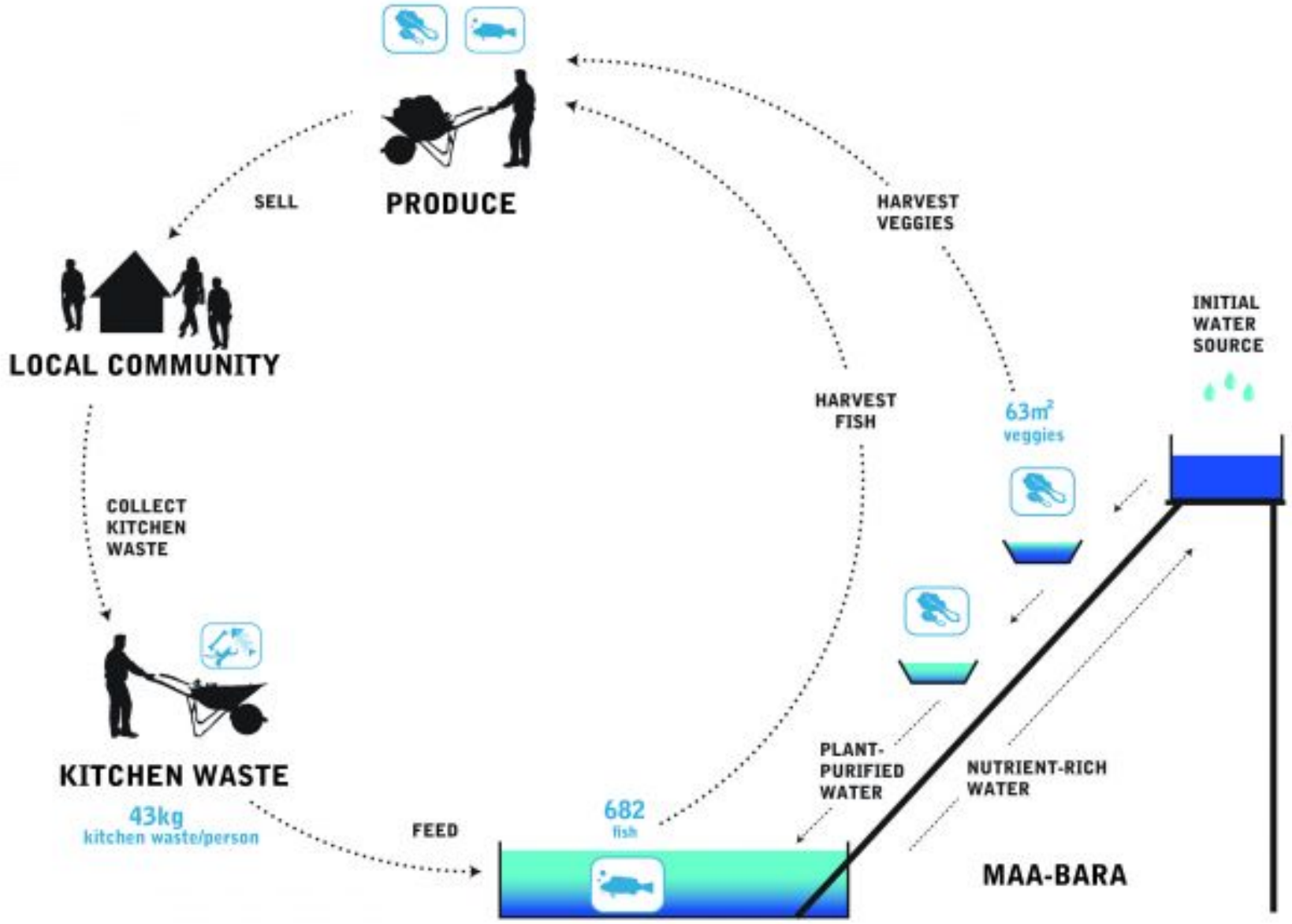
Maa-Bara: a closed-loop system produce safe fish & vegetable in a polluted environment.



NITROGEN CYCLE:

Fish feed ▶ FISH ▶ Fish wastes + Uneaten feed ▶ Ammonia (NH_3) ▶ Nitrosomonas Bacteria ▶ Nitrite (NO_2) ▶ Nitrobactor Bacteria ▶ Nitrate (NO_3) ▶ VEGETABLES ▶ Clean water ▶ FISH

Self-sustaining (Low cost low input) food production at home: Aquaponic



INNOVATIVE NUTRIENT CYCLE: WASTE =FOOD

Suggestion: more research on growing local crops

Suggestion: Innovation-New varieties with high phytochemical

Source: 1) Chainmail ,Feb 2005 2) www.cooksgarden.com 3) :www.tenderstem.co.uk/photography1.htm 4) www.elsoms.com/PDFs/32-40.pdf 5) Tokita seed catalogue 6) Agritech Israel, 2007 7) www.burpee.com 8) www.freshplaza.com/news_detail.asp?id=57646 9) www.sunsetproduce.com 10) www.ars.usda.gov/is/AR/archive/sep06/ veg0906.htm 11) www.flickr.com/photos/schill/3047487042 12) www.vitaminis.nl 13) www.snoepmaatjes.nl

Suggestion: Innovation-New recipes

NUTRITION FACTS
Serving size: 100g

Amount per serving
Calories: 25 — Calories from Fat 0

	% Daily Value*
Total Fat: 0g	0%
Saturated Fat: 0g	0%
Trans Fat: 0g	
Cholesterol: 0mg	0%
Sodium: 0mg	0%
Total Carbohydrate: 5g	2%
Dietary Fiber: 2g	0%
Sugars: 5g	
Protein: 1g	

Vitamin A: 10% — Vitamin C: 30%
Calcium: 0% — Iron: 2%

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

Source: www.sunsetproduce.com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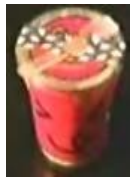


ผลไม้กลับชาติ ที่มา: www.tvburabha.com
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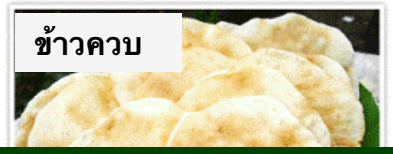

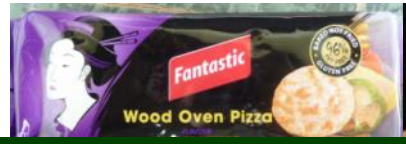

Thank you for your attention




www.squidoo.com/bento-food-color-dye