SMART SUSTAINABLE AGRICULTURE AND FOOD SYSTEM
Bayanihan towards Smart Sustainable Community Supported Agriculture

Amihan Mercado Lubag-Arquiza
ICropS, CAFS, UPLB
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Agriculture now

• interdisciplinary and integrative system practiced in many areas of the world needing more attention in terms of development of innovative approaches suitable to different areas.

• Population and consumption growth increase the global demand for food, land, water, energy and fishery resources.

• As more people reside in urban areas, accompanied by threats of reducing agricultural land in rural areas, the pressures of climate change, food security, environment, human health and safety needs to be addressed.
BAYAN KO:

.......Ginto at Bulaklak beyond money and yield
Seminar overview

This seminar presents an overview of concepts, components and select models from different parts of the Philippines, South East Asia and the United States that can be considered for the agriculture and food system of the future that goes beyond crop or food production but includes service oriented endeavors and industry linkages.

Community supported agriculture and global competitiveness as a range of targets for both urban and rural areas needing focus that includes terrestrial lands, aquatic areas and atmosphere or air cleaning for our sustenance.
Seminar goals

share ideas, experience and propose solutions appropriate for select conditions or areas to improve farm productivity, food availability, human health and environmental sustainability.

Envision possible areas for future research and development
Rural and Urban agriculture and food needs
Soil and water resources in farms and communities
Smart sustainable agriculture will integrate innovative and classical tested approaches and strategies to respond to the needs of the times and the challenges of the future.

- Climate smart agriculture is promoted as well as the recognition of having smart sustainable cities (Hilty and Aebischer, 2014), urban communities and regions. The fusion of new information and communication systems as well as social and cultural aspects beyond the usual biological and environmental considerations in agriculture systems and industry changes the scenario.

- An expanded new urban agriculture sector that includes specialty products, services and activities is envisioned to make the system more vibrant, resilient, sustainable, human health and environmental friendly.
SMART components: Smart (farm, garden, market, farmer, gardener, customers, climate etc)

• SMART CITY

Concept part
What are new ways to have sustainable development in the world? (WEC 2019)
Mango for food, shade, lumber, tea and Carbon sequestration living machine
Disaster prone country: Paskong Yolanda aftermath, Leyte
Scenario:
Need to bridge agriculture and food processing
In 401 B.C.E., the Greek historian Xenophon, in his *Oeconomicus*, Book IV, introduced the idea of the pleasure garden (Persian, *paradeisos*, "enclosure") to Greece, based on gardens he had seen while fighting in Persia, and recommended its imitation. “

Horticulture as an art, science and business of cultivation of fruits, vegetable and ornamentals

What do we consider as gardens?
Beauty and serenity at the Cornell Botanical Gardens, College of Agriculture and Life Sciences, Cornell University, Ithaca, New York
Fall leaf senescence Cornell campus and volunteerism.
Cornell Plantations Welcome Center: GOLD LEED award
“Garden”: Paradise, like heaven on earth
Prayer Mountain, Davao City
Lubag Mercado Medical mission and release of newly hatched sea turtles in Naic, Cavite
Fulbright Friends: roving conference and extension sharing knowledge
Sharing and learning with farmers and industry
Luzon, Visayas and Mindanao open our eyes
Local seed and food bank: lessons learned needed after Yolanda
Disaster Capital: Our mobile kitchen, clean water system and seed distributor, YOLANDA Outreach: Who wants a career in disaster relief and rehabilitation?
Use of native materials in the landscape

Zoysia matrella, Manila grass
And replanting of native trees and other early introductions
Aquatics? Ornamental Rice-Anyone? Water use efficiency in food crops?
Agritourism
Balik-bukid, Davao city (bed and breakfast)
Agri-ecotourism venture at Puentespina’s in Davao
Product safety: What if agriculture products came from an undisclosed area and handled poorly?
Thailand ahead in agriculture but needed our help on organic agriculture: ASEAN+3 conference
Premium price for specialty Geo tagged products: Centennial mangoes from Guimaras for the royals
Smart Sustainable Agriculture

Agriculture Connection and Relationship with

• Sustainable Agriculture,
• Ecological Agriculture,
• Organic Agriculture,
• Climate Smart Agriculture,
• Controlled Environment Agriculture,
• Precision Agriculture,
• Green Agriculture
• Urban Landscaping,
• Urban Agriculture and Urban Horticulture
• Agribusiness, Food processing and Agri-industrialization
Understanding Subsistence and State of the Art Technologies in

• Soil and water use conservation
• Nutrient sources and recycling
• Information and communication technologies
• Integration with city, regional or global allied fields
• Architecture and urban planning
• Agricultural biotechnology and biosystems engineering
Urban Agriculture: Components, Features and Types

• Crops, Livestock, Aquaculture, Processing, Market, Garden, Leisure and Landscape

• Residential Gardens, Community Gardens, Private Development, Institutional Farms, Public Gardens

• Farm Estate, Community Farms

• 4 CLASSIFICATIONS presented in the next slides
Urban Horticulture

• Micro Container, kitchen and home gardening
• Micro gardening and Roof top gardening
• Kitchen Gardens and Edible Landscaping
• Community gardening and closed loop agriculture-Zero waste
• Aquaponics, hydroponics and Aquaculture
Ecosystem agriculture:

- Crop Livestock integration
- Riverside, Lakeside or Beach side gardens (UH)
- Urban farms (UH)
- Agroforestry and watershed or storage systems
- Mushroom, Insect and Animal Pet Farming
- Low, mid or highland farm
Social and Urban Market Agriculture

• Farm school, training center and agritourism

• Farmers Market, Garden Centers, Stalls and Agri-fairs

• Food cart, garden restaurant, truck and e commerce promotion and distribution systems
Intensive capital requiring large systems: (UH)

• Urban greening, green roof and vertical green systems
• Vertical Farms
• Environmental Agriculture systems
• Phytoremediation systems
Imagine new areas for planting: food, feed, air
Vertical gardens at Siam Paragon, Thailand
SMART features: integration of innovative technologies (rainwater collection, solar power, lights, sounds, computer, climate controls) at Supertrees of Marina Gardens by the Bay and Jewel Singapore airport.
• Mexico City's vertical gardens: seeds of change or cynical greenwashing?
• Do we need to plant more trees or easy to maintain epiphytes and aquatics?
GREEN ROOF FARM: Siam Sky
http://www.thaitravelblogs.com/2015/05/siam-green-sky-is-the-largest-urban-rooftop-garden-in-bangkok/
Benefits of urban agriculture

- The benefits attributed to urban agriculture includes city greening and beautification and improved nutrition, public and mental health, community food solutions, climate mitigation, community building, economic development and empowerment.

- Those highlighting the benefits of environmental and ecological impacts of urban agriculture cite reduced urban heat island effect, improved local air quality, improved stormwater quality (and reduced quantity), increased pollinator population, and climate mitigation services like carbon sequestration (Siegner et al, 2018)
Modern Agriculture in Developed world

- Internet of Things
- Controlled Environment
- Drip Irrigation
- Hydroponics, Aquaponics
- Drone use in monitoring and pest control
- Mechanized farming
- Programmed logistics
- Robotics
- Artificial Intelligence, Big Data
Heritage Conservation

Palayamanan: A revival of an old practice. My lolo’s farm in Sorsogon was ahead of the times

What about Philrice and IRRI experience?
C. 2012 GS winner: Costales Nature Farm, Majayjay, Laguna (Mr. Ronald Costales)
Modeling strength, lifespan and use of space
Aquaponics and the Mexican floating rivers

Plants That Live in the Waters of the Amazon Rivers

By Clare Smith; Updated April 24, 2017
Community supported agriculture

• community and/or local produce,
• share or subscriptions sold prior to season,
• and weekly deliveries to members/subscribers

• More associated in the early days to organic and biodynamic growers
But use here it as a term not only restricted to that
Potential expansion could be:

technical support, financing with low or no interest,
Community Supported Agriculture

• Farm to Market
• Farm to Table
• Seed to Table
• You pick

• Quality assurance
• for global competitiveness
Events and fine dining: Sonya’s Garden-seed to plate
Agriecotourism, healthy products and entrepreneurship: farm to table, key to community development and native plant conservation
Vegan feasts with foreigners: Davao Durian tastings at the Belviz farm
Medicinals and therapeutics: emerging crops
Are food medicines? Calabash, miracle fruit
Thailand banana leaf packaging
a tradition alive
Farm to Table: Fine dining restaurant in Upstate New York and Vineyard, winery and restaurant in California.
Tropical plants in restaurant interiors at Antonio’s Tagaytay
More high value crops to grow beyond rice: price of product has peak demand periods harvestable product and biomass
Community Gardens
Hydroponics, Aquaponics and Rooftop gardening: water needs
Smart new gardens: Green Roof, why not vegetables or fruits?
Growing Chamber
“Wardian Case”
Optimum conditions
Can we grow our Philippine moss like these?
Modeling strength, lifespan and use of space
Controlled environment greenhouse: Optimization of energy use
Bosco Vegetale, Milan, Italy

- [https://www.ambienteambienti.com/bosco-verticale-natura-sostenibilita](https://www.ambienteambienti.com/bosco-verticale-natura-sostenibilita)
Imagine, there are so much more we can do

• Sparkling Trees and Shrubs for the roadsides and gardens
• Luminiscent Plants to lighten our path
• Cooling Plants and Gardens
• Mixed plants for steps, roofs and walls
• Barter, food exchange and gifting system
• Low cost reliable production systems
• Mobile farming
• Bio based crop-pest management
Can we produce more food or other products from the seas or the coastal areas?

• Can we make agriculture respond to the environmental hazards in both urban, rural or industrial areas? MARAMING SALAMAT