

APPLICATION OF SCIENCE AND TECHNOLOGY TO NATURAL FARMING AND ORGANIC AGRICULTURE SYSTEMS: A Component of Drought Resistant Natural Farming Project

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Science and technology are essential for national development and progress.

The State shall give priority to research and development, invention, innovation, and their utilization; and to science and technology education, training, and services.

Sec. 10, Art. XIV, 1987 Phil Constitution



Interconnections between Science and Technology

- Without science, technology could not proceed.



Science
is a way of
Knowing

Technology
is a way of
Doing



S & T are considered among the most effective means to enhance growth and socio-economic development of nations. (Stoneman, 1987).



Source:
Science, technology and sustainable development:
a world review
Allam Ahmed

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.457.9822&rep=rep1&type=pdf>

Technological development has a profound and long-term impact on income distribution, economic growth, employment, trade, environment, industrial structure and defense and security matters (Stoneman,1987).

Interconnections between Science and Technology

- Without **technology**, some science experiments would not be possible.



The acquisition and use of S&T are critical for the achievement and sustenance of food security, as well as the promotion of public health and environmental quality.

The importance of S & T to modern societies, and the role of a technologically educated population in promoting social and economic development, has long been recognised (UN, 2002; 2002a).



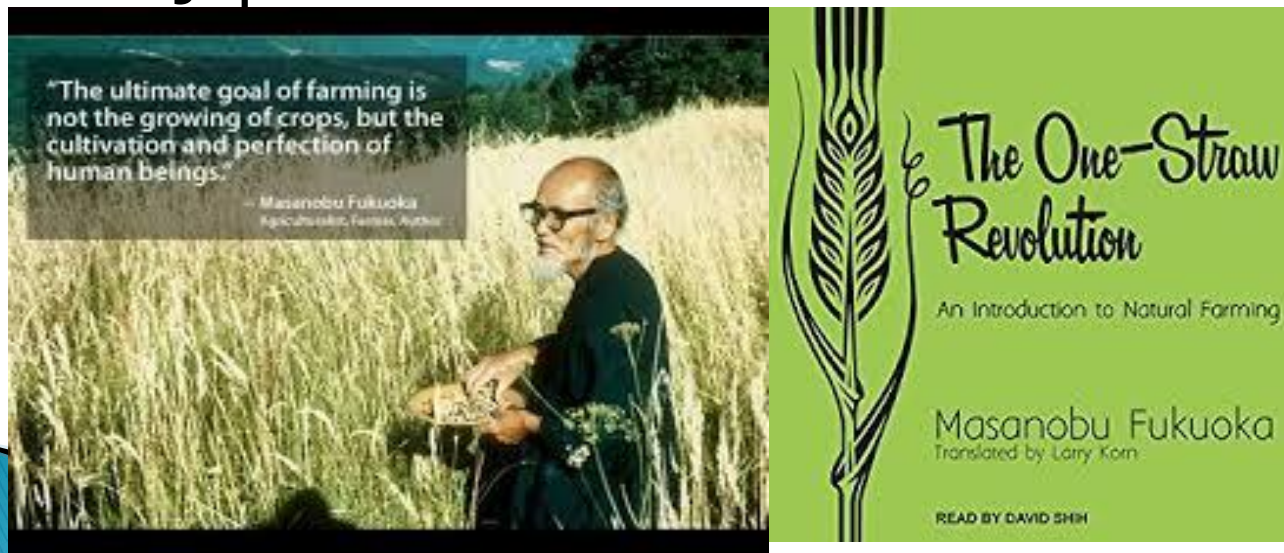
Principle 18
Stockholm Declaration
1972 UN Conference on Human Environment

S & T , as part of their contribution to economic and social development, must be applied to the identification, avoidance and control of environmental risks and the solution of environmental problems and for the common good of mankind



S & T in Nature Farming and Organic Agriculture

Natural farming is an ecological farming approach established by Masanobu Fukuoka (1913–2008), a Japanese farmer and philosopher, introduced in his 1975 book *The One-Straw Revolution*. Fukuoka described his way of farming as 自然農法 (shizen nōhō) in Japanese.



Cho Han Kyu, or Cho Han-kyu, born in 1935 in Suwon, Gyeonggi Province, Korea, invented the Korean Natural Farming method.



The fundamental insight of KNF is to strengthen the biological functions of every aspect of plant growth to increase productivity and nutrition.

- Use the nutrients contained within the seeds
- Use indigenous microorganisms (IMO's)
- Maximize inborn potential with fewer inputs
- Avoid commercial fertilizers
- Avoid tilling
- No use of livestock waste



Organic or Natural? What's the difference?

INGREDIENT/PROCESSING	ORGANIC	NATURAL	CONVENTIONAL
Artificial flavors	NEVER	No	May be used
Artificial colors	NEVER	No	May be used
Artificial preservatives	NEVER	No	May be used
Artificial fertilizers	NEVER	May be used	May be used
Artificial pesticides	NEVER	May be used	May be used
Irradiation	NEVER	May be used	May be used
Genetically Engineered Ingredients	NEVER	May be used	May be used



Definition of “Organic”

- ❑ **Organic agriculture is an ecological production management system** that promotes and enhances biodiversity, biological cycles and soil biological activity. It is based on minimal use of off-farm inputs and on management practices that restore, maintain and enhance ecological harmony.
- ❑ **‘Organic’ is also a labeling term** that denotes products produced following the guidelines for organic production and use materials and practices that enhance the ecological balance of natural systems and that integrate the parts of the farming system into an ecological whole.

ORGANIC farming is a climate solution

In times of drought and flood, organic outperforms industrial agriculture. It also conserves water, saves energy and captures more carbon in the soil.

Get the facts at www.foe.org



Breadfruit (*Artocarpus altilis*) or popularly known as Kolo or Rimas

Native of the Pacific Islands, its name is derived from the fact that, when cooked, the fruit of the breadfruit tree has a potato-like flavor, similar to fresh-baked bread.



DA readies P36 million roadmap for 'rimas'

Rosalinda L. Orosa (The Philippine Star) – March 10, 2013 – 12:00am

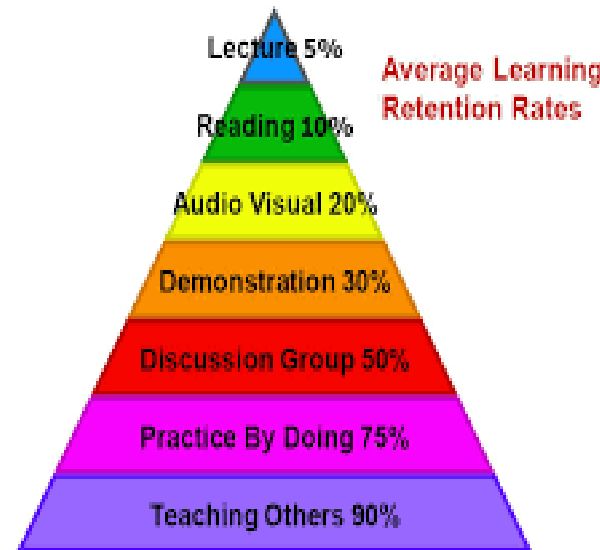
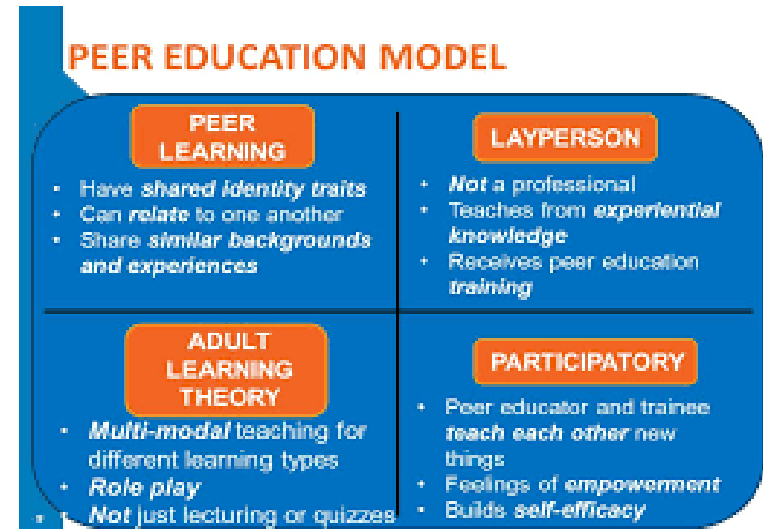
MANILA, Philippines – The Department of Agriculture (DA) is putting up nurseries for nutrient-rich starchy breadfruit or rimas under a P36 million roadmap.

IT IS A NO-WASTE FARM MANAGEMENT AND DROUGHT RESISTANT.

Farm Residue and Climate Resilient Management

THE TRAINING SYSTEM IS COMPETENCY-BASED AND MORE ON EXPERIENTIAL LEARNING AND EXPERIMENTATION. IT IS ALSO BASED ON ADULT-LEARNING CONCEPTS AND PRACTICES WITH APPLICATION ON PEER-LEARNING METHODS

Competency-Based Training System experiential adult peer learning



Source: National Training Laboratories, Bethel, Maine



TRADITIONAL Instruction

COMPETENCY-BASED Instruction

Structure	Time-based	Learner-centered
Teaching mode	Group learning	Individualized
Assessment Method	Summative, high stakes	Mastery-learning, performance-based
Pace	Faculty-paced	Self-paced
Program completion	Finish when required courses are passed	Finish when mastery of courses is demonstrated

T - TOGETHER
E - EVERYONE
A - ACHIEVES
M - MORE



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IF YOU WANT
TO GO FAST
GO ALONE
IF YOU WANT
TO GO FAR
GO TOGETHER



Talent wins games, but
teamwork and intelligence
wins championships.

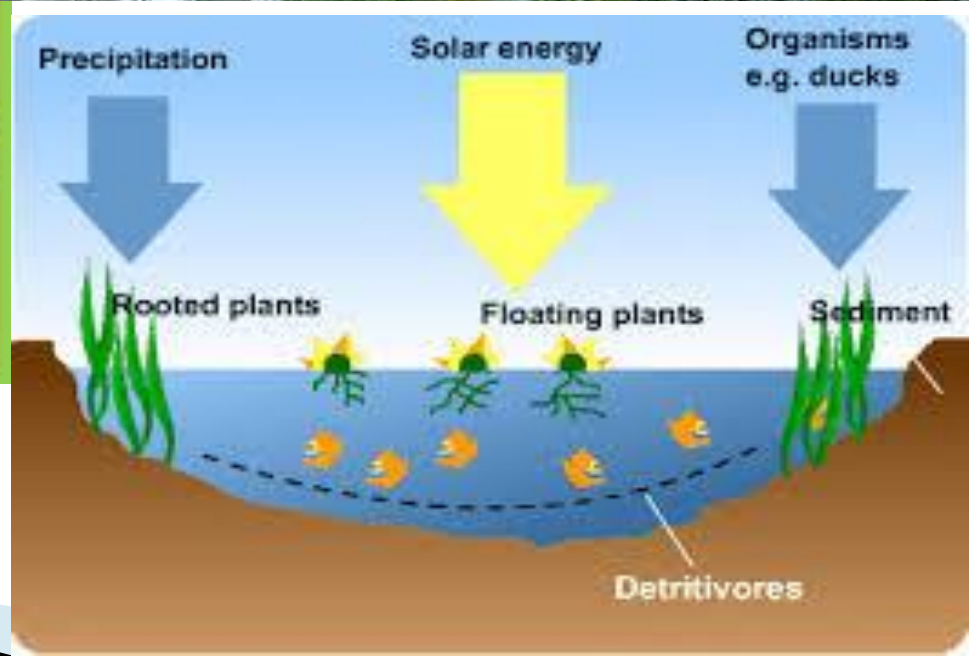
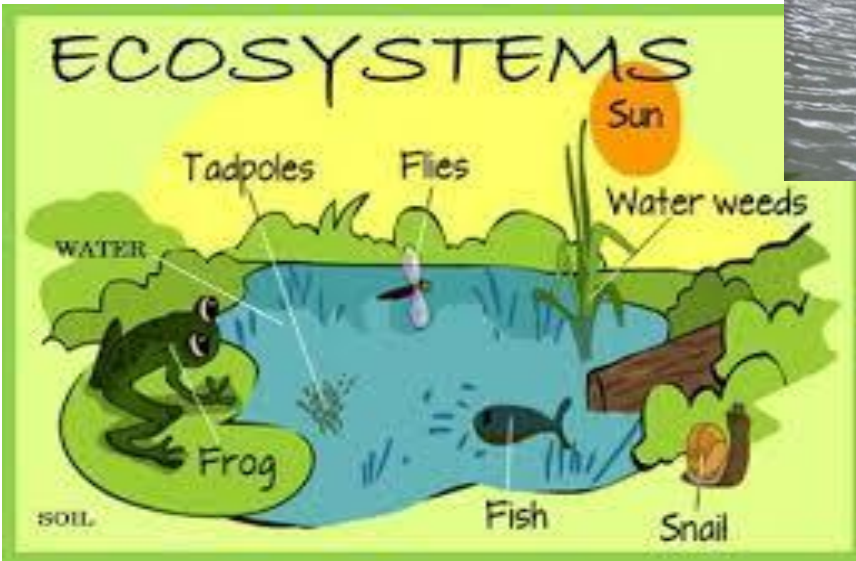
Michael Jordan

BrainyQuote

TEAMWORK
MAKES THE
DREAM WORK

Definition of an Ecosystem

- A biological community of interacting organisms and their physical environment. Ecosystems consist of plants, animals and microorganisms working together as a functional unit.



ISSUES AND CONCERNS

1. CLIMATE CHANGE IS INCREASING
2. LARGER WASTE IN THE UTILIZATION OF RESOURCES
3. HUMAN LIFE IS THREATENED WITH THE SCARCITY OF FOOD
4. THIS GENERATION TENDS TO CONSUME RESOURCES INTENDED FOR THE NEXT GENERATION
5. THE MEAT EATING HABITS OF HUMANS FUEL THE NEED TO USE MORE RESOURCES FOR FOOD THAN WHAT IS NECESSARY FOR HUMAN SURVIVAL AND BEING HEALTHY

1. CLIMATE SMART AGRICULTURE: adaptation, precision agriculture
2. NO WASTE PRINCIPLE IN THE FARM
3. FOOD SCARCITY IS DEBATABLE ISSUE. FOOD DISTRIBUTION . EMPHASIS ON FAMILY FARMS
4. SD DEFINITION. MAINSTREAMING RESPONSIBLE CONSUMPTION
5. VEGETARIANISM IS A GROWING MOVEMENT. ORGANIC FARMERS ARE MOSTLY HEALTH CONSCIOUS. PROMOTE WELLNESS FARMS

PLEDGE OF A CLIMATE SMART NATURAL FARMER

I shall endeavor to understand that **micro-organisms** play a major role in **sustaining** the farm, human life and communities.

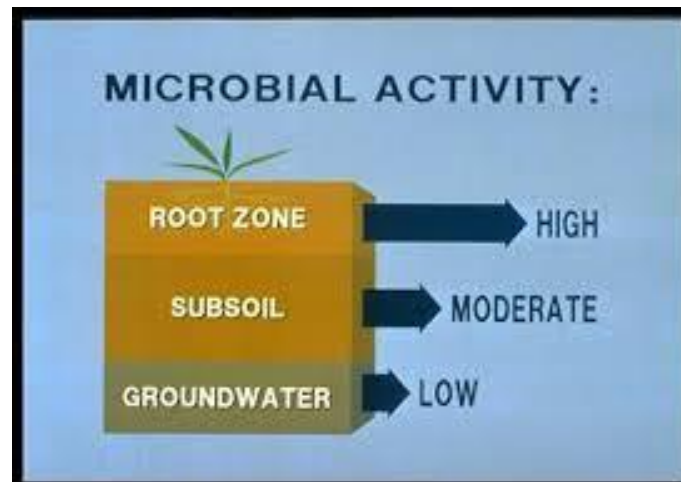
I shall assimilate the principle of inter-relationship (**unity and connectedness**) of (**all forms of life**) plant and human life

I shall make use of waste (**residue**) of one as an input to the other using science and technology to reduce farm cost

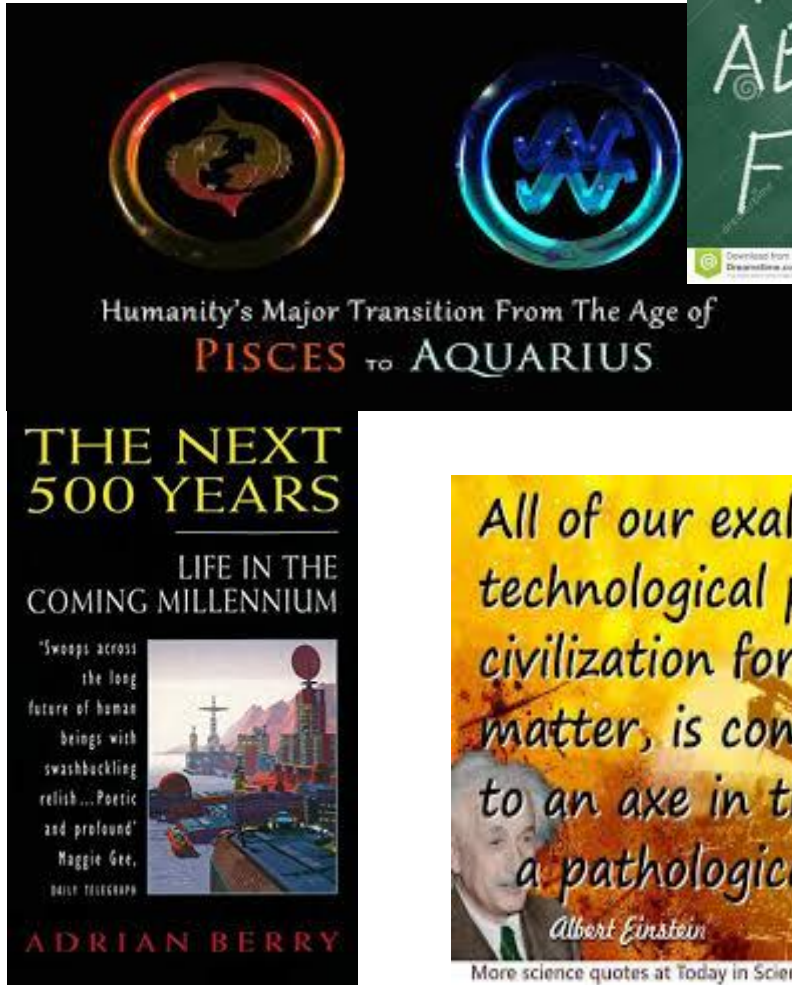
Organisms in a healthy soil

(by prof. P. Douillet)

Organism	Number/ ha	Kg / ha
Bacteria	2,000,000,000,000,000,000	2,914
Actinomycetes	50,000,000,000,000,000	1,457
Fungae	500,000,000,000,000	2,914
Algae	9,884,000,000	101
Protozoa	5,000,000,000,000	101
Nematodes	197,680,000	50
Arthropodes	20,163,360	930
Worms	98,840	499



WILL HUMANS SURVIVE THE NEXT 500 YEARS?




Humanity's Major Transition From The Age of
PISCES to **AQUARIUS**

THE NEXT 500 YEARS


LIFE IN THE COMING MILLENNIUM

"Swoops across the long future of human beings with swashbuckling relish... Poetic and profound" Maggie Gee, *DAILY TELEGRAPH*



ADRIAN BERRY

THINKING ABOUT THE FUTURE!




What Will Life Be Like in the FUTURE?

All of our exalted technological progress, civilization for that matter, is comparable to an axe in the hand of a pathological criminal.

Albert Einstein

More science quotes at Today in Science History todayinsci.com



"If you want to find the secrets of the universe, think in terms of energy, frequency and vibration..."

Nikola Tesla

HUMANS IN 100,000 YEARS...



VIDEO
LAWREN

AMBISYON NATIN 2040

In 2040, we will all enjoy a stable and comfortable lifestyle, secure in the knowledge that we have enough for our daily needs and unexpected expenses, that we can plan and prepare for our own and our children's future.

Our family lives together in a place of our own, and we have the freedom to go where we desire, protected and enabled by a clean, efficient and fair government."

