Conserving Philippine Agro-biodiversity for Nutrition: The Role of Schools

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Agrobiodiversity conservation is central to food and nutrition security.
Maintaining genetic diversity (crops, livestock, trees) is essential if we are to reduce vulnerability to climate change, natural disasters.

Source: The Irish Potato Famine: Irish Immigrants Come to America 1845-1850 (Primary Sources of Immigration and Migration in America) Paperback – August 1, 2004 by Jeremy Thornton (Author)
We need to maintain inter-species diversity (lots of crops) and also intra-species diversity (e.g. lots of varieties of one crop).
One thing is certain about the future: higher temperatures, too much or too little rain will increase the risks and bring in unpredictability which will make our food systems vulnerable.
Higher temperatures and too much moisture for example, could mean more pests and more diseases. This could mean an increase in pesticide use with resulting food safety concerns rising.
Unfortunately, modern varieties often factor the highest productivity under the best of conditions (they are raised in green houses or farms equipped with irrigation, fertilized very well and sprayed regularly). Bringing them to our homes and gardens these varieties are challenged by the less than optimum conditions. The question we need to ask: **How do we OPTIMIZE production under low or reasonable levels of inputs?**
Adaptation is therefore a key concept for family farms, home gardens and school gardens.
We need to bring back diversity that we have lost.

Photo credits: Ronnie de Castro, IIRR
Garden diversity invariably also means dietary diversity and nutritional diversity. Diversify the garden and the rest will follow.
Schools are the logical place to start a program to reintroduce and conserve agro biodiversity. School Gardens can be showcases for diversity. Schools can feature new recipes in canteens. Feeding programs can enhance the use of vegetables in their programs for malnourished children.

Photo credits: Gardens in Schools, Batangas Rollout, Aug 31, 2017 Powerpoint presentation.
Dietary habits of adults are shaped in their homes and schools: include vegetables in the diets of kids and they grow up as adults valuing vegetables.
However, the challenge is huge because of lifestyle changes (resulting from the entry of fast food culture and advertisements) in the last few years.
The results are well known: the Philippines is faced with having to deal with malnutrition of the very young AND of school aged children.
This is the reason that IIRR and FNRI offer a range of menu options so that available vegetables in the garden can be used (seasonality is a reality so menus need to be flexible).

Photo credits: Gardens in Schools_Batangas Rollout_Aug31.2017 Powerpoint presentation
Few realize that indigenous vegetables are generally better sources of nutrients than exotic vegetables (carrots and tomatoes are an exception).
We often forget the importance of micronutrients.

Cowpea (paayap) is one of the most drought tolerant crops

Cowpea per 100 grams
- 2.7 grams protein
- 0.2 fats
- 5.8 carbohydrates
- 2.7 dietary fiber
- 18 grams Vitamin (almost high as tomato)
Aside from micronutrients, we need fiber, antioxidants, anthocyanins, the range of Vit. B requirements.

Photo credits: Ronnie de Castro, IIRR
It’s really simple: one cup of red, yellow and green vegetables/ fruits three servings a day and we have our requirements.
When we grow indigenous vegetable multiple parts are consumed: flowers, shoots, tubers or pods. Harvests are spread over a wider period (unlike commercial varieties that come to peak harvest).
Locally adapted vegetable varieties have evolved with time and continue to evolve. Their (genetically speaking) capacity to adapt are unusual, e.g. tolerate longer drought periods and occasional short duration floods.
Local crops perform well under low input conditions as they have evolved under those conditions.

Photo credits: Ronnie de Castro, IIRR
With concerns about climate change (variability especially) we have conserve these valuable genetic resources and there is no better place than home gardens and schools.

Photo credits: Ronnie de Castro, IIRR
This the idea behind CROP MUSEUMs in schools. Crop museum search for vanishing varieties, reproduce them and share them with other schools and local communities. They also help propagate seeds, cuttings of shrubs and trees.
A school based crop museum organizes annual seed exchange fairs. Seed exchange events are crucial for re-introducing crop AND varietal diversity.
A 70:30 model is used to feature a bigger role for indigenous or locally adapted vegetables and a lesser but strategic role for exotic vegetables.
The bio-intensive garden methods tested in the Philippine since the late 1980s and endorsed by the Dept. of Education provides that opportunity to conserve agrobiodiversity.
No chemicals are used in school gardens and the BIG system features organic matters from *kakawate* and *calliandra*, the two flagships trees promoted in BIG systems.

Photo source: BIG Characteristics and Practices Powerpoint presentation
The BIG systems conserves not only above ground biodiversity but also BELOW ground biodiversity.

Photo source: BIG Characteristics and Practices Powerpoint presentation
Below ground biodiversity consists of beneficial microbes and earthworms.
Soil agrobiodiversity cannot be conserved if there is no organic matter. Dark rich soils are important for conserving below ground biodiversity.
Bio-intensive gardens conserve both ABOVE ground and BELOW ground biodiversity.

Photo source: BiG Characteristics and Practices Powerpoint presentation
Crop museums therefore can serve as focal points for learning about nutrition, food systems and food safety, about science, environment and good health. Crop museums help bring back diversity and conserve these genetic resources for our future needs.
Lighthouse schools demonstrate the value of integrated approaches (feeding programs, gardens and nutrition education). These schools provide hard data (evidence) that local officials and investors need. Lighthouses put a premium to achieving SUSTAINABILITY while also supporting local SCALING.
THANKS!

Any questions?

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