INTEGRATED APPROACH TO IMPLEMENT SCHOOL NUTRITION PROGRAMS - RESEARCH RESULTS

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IDRC Grant/ Subvention du CRDI: 108156-001-Improving food and nutrition security in the Philippines through school interventions
An Integrated Approach to Implement School Nutrition Programs

I. The GarNESupp Program: Model-building & Scaling Up

II. GarNESupp Program Works: Scientific Evidence

III. Program Directions
**Program Road Map**

### Phase 1

**Model Development:**
“Integrated School Nutrition Model” (ISNM)

*IIRR, FNRI-DOST, DepEd, IDRC-Canada*

#### Key Year

2012

- **27 Schools from Cavite Province adopting ISNM**

### Phase 2

**Fine tuning of the model & Scaling Up**

*IIRR, FNRI-DOST, DepEd, DA, NNC, CSOs/NGOs, IDRC-Canada*

#### Key Year

2016

- **58 Lighthouse Schools from Region 4A**

#### Key Year

2018 (ongoing)
The Innovation: Integrated School Nutrition Model

The aim is to enhance and strengthen the links of various nutrition/food security interventions.

The model is a mix of nutrition sensitive and nutrition specific innovations.
The Enhanced Garden

Schools gardens were rehabilitated and revived through the introduction of simple, agro-ecological, low external input, totally chemical free approach ensuring safe food innovation such as **bio-intensive gardening approach (BIG)**.
Kakawate/ Calliandra trees are grown as source of fertilizer & windbreak. It can also create micro climate within the garden.
The Enhanced Garden

Deep dug garden beds helped plant roots establish and also help conserve water.
The Enhanced Garden

Garden diversity and prioritization of indigenous vegetables provided a wide array of healthy food.
One-hundred twenty days (120) of feeding with iron-fortified rice and recipes using indigenous vegetables.
Hygiene & values were also emphasized
Sustaining the Gains (Nutrition Education)

Various nutrition education strategies were tested and adapted for school children and parents.
Schools Gardens served as learning laboratories
Nutrition information & education materials were developed and distributed.
Recipe booklets equipped parents to prepare healthy & affordable food

Iron Rich RECIPES

Procedure
1. In a pan, sauté garlic, onion and pork. Cover and simmer until pork is thoroughly cooked.
2. Season with patis, soy sauce and pepper.
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Research Framework

Integrated school Nutrition Model

School Garden

Supplementary Feeding

Nutrition Education

Impacts

- Sustained, diverse nutritionally relevant school gardens
- Improved nutritional status
- Recognition by children, parents and teachers of the value of vegetable diversity in diets

From Modeling to Scale

- Fine tuning of the integrated school nutrition model
- Scale out / scale up school based nutrition model through multi-scalar approach
- Use schools as platforms for nutrition and environmental learning and sharing

Expected Outcomes

- Institutionalized and sustained integrated school-based nutrition program
- Wider adoption of bio-intensive gardening (BIG)
- Strengthened school gardening and feeding links
- Increased investment on school nutrition programming
- Enabling policies supportive of school nutrition
Multi scalar approach to scale up the school nutrition model

National level:
Department of Education, relevant national agencies, key decision makers and bilateral and multi lateral donor organizations

Sub national level
At least 400 schools in Region 4A (critical mass)

Advocacy/ Nationwide adoption

Exposure visits
Multi-stakeholder dialogue
Capacity strengthening
Advocacy activities

Partnership/collaboration

Lighthouse schools and crop museums serving as learning and action research sites

Expansion/wider adoption

Learning exchanges
Capacity building
Information dissemination at multiple levels

Exposure visits
Conference/Fora
Dialogue
Dissemination of information, education and communication materials

The private sector
Civil society organizations
Local government units
Lighthouse Schools play a central role in out-scaling of Integrated School Nutrition Model at the local/district level.

They are expected to initiate or organize district level, hands-on trainings, and seed exchange events.
Establishment of Crop museums

Crop museum Schools – as platform for conserving climate hardy and nutritionally important agrobiodiversity.

- Serve as venue for district level seed exchange and seed fair.
- Serve as nurseries (source of planting materials) for others schools & communities.
Training Manuals & Nutrition modules empowered program implementers
Multi scalar approach to scale up the school nutrition model

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Adoption of Bio-Intensive Gardening
Adoption of Bio-Intensive Gardening

27 Schools (Cavite Province)

58 Lighthouse Schools (Region 4A)

1695 Schools
Establishment and Expansion of Crop museums

58 CM

237 CM (59%)
<table>
<thead>
<tr>
<th>Sentinel Schools</th>
<th>Lighthouse Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunny Brooke Elementary School (Gen. Trias City)</td>
<td>Malitam Elementary School (Batangas City)</td>
</tr>
<tr>
<td>Tinabunan Elementary School (Imus City)</td>
<td>San Antonio Central Elementary School (San Antonio, Quezon)</td>
</tr>
<tr>
<td>Julugan Elementary School (Tanza, Cavite)</td>
<td>Liliw Central Elementary School (Liliw, Laguna)</td>
</tr>
</tbody>
</table>
Achieving diversity

Types of Crop Grown (in the 3 sentinel schools)

Classification of crops grown according to uses
Garden output (July 2016 - May 2017)

Garden Area = 200 sq.m

- Julugan ES (JES)
  - Area (m²): 200.00
  - Total Yield (kg): 527.72
  - Revenue: ₱30,534.10

- Sunnybrooke ES (SBES)
  - Area (m²): 200.00
  - Total Yield (kg): 818.11
  - Revenue: ₱44,370.42

- Tinabunan ES (TES)
  - Area (m²): 200.00
  - Total Yield (kg): 795.67
  - Revenue: ₱49,259.01

Total Revenue: ₱41,387.8
Vegetables were Used

- Shared to Others for Free: 24%
- Sold: 6%
- Canteen Use: 11%
- SBFP: 59%
### Garden Contribution to SBFP

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Vegetable consumption</td>
<td>270.73 kg</td>
</tr>
<tr>
<td>Equivalent SBFP Savings</td>
<td>0.35 Php per capita</td>
</tr>
<tr>
<td># of SBFP recipients in</td>
<td>1,823,443 students</td>
</tr>
<tr>
<td>Reg4A (SY 2017-2018)</td>
<td></td>
</tr>
<tr>
<td>Equivalent savings in</td>
<td>Php 76,584,606</td>
</tr>
<tr>
<td>120-day feeding cycle</td>
<td></td>
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</tbody>
</table>

*120-day feeding*
Diversity in crops

- In 55 lighthouse schools – total of 26 different crops were grown

- In sentinel research sites – total of 60 different crops were grown
Gardens as support to learning areas

Meeting time (Kinder 2)

Edukasyon sa Pagpapakatao

Science

Araling Panlipunuan/
HEKASI/ MAPEH/ English/
Filipino/ Mother Tongue/
Kinder period 2

Mathematics

Edukasyon Pantahananan at Pangkabuhayan
Gardens were sustained with no major external funding or acquisition of inputs but major investment was in the form of capacity development.

The prospect for sustained gardens at the school level has been enhanced.
Anthropometric measurement

Weight taking

Height taking
Standardized recipes using Indigenous vegetables were utilized.
The Healthy Meal

Hygiene & values were emphasized
Results of 120 feeding days

There was a **significant increase in the mean weight and height** of children, both males and females.
Results of 120 feeding days

Mean weight of children aged 5.1 to 10 yrs.

<table>
<thead>
<tr>
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<th>Male (n=54)</th>
<th>Female (n=65)</th>
</tr>
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<tbody>
<tr>
<td>Base</td>
<td>18.68</td>
<td>18.34</td>
</tr>
<tr>
<td>Mid</td>
<td>19.89</td>
<td>19.5</td>
</tr>
<tr>
<td>End</td>
<td>20.41</td>
<td>20.29</td>
</tr>
</tbody>
</table>
Results of 120 feeding days

Mean weight of children aged 10.1 to 19 yrs.

- **Male (n=83)**
  - Base: 25.32 kg
  - Mid: 26.53 kg
  - End: 27.71 kg

- **Female (n=75)**
  - Base: 24.57 kg
  - Mid: 26.23 kg
  - End: 27.44 kg

**Mean weight:**
- Male: 25.93 kg
- Female: 26.07 kg

**Change over 120 days:**
- Male: +2.41 kg
- Female: +2.07 kg

**Difference between genders:**
- Male: 0.87 kg
- Female: 0.97 kg
Results of 120 feeding days

Mean height of children aged 5.1 to 10 yrs.

- **Base**
  - Male (n=54): 120.4 cm
  - Female (n=65): 120.55 cm
- **Mid**
  - Male: 122.39 cm
  - Female: 122.61 cm
- **End**
  - Male: 123.9 cm
  - Female: 124.3 cm

**Mean height of children aged 5.1 to 10 yrs.**

- Male: 120.4 cm to 123.9 cm
- Female: 120.55 cm to 124.3 cm
Results of 120 feeding days

Mean height of children aged 10.1 to 19 yrs.

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<td>134.71</td>
<td>136.93</td>
<td>139.31</td>
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<tr>
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<td>135.04</td>
<td>137.48</td>
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Results of 120 feeding days
Comparison of mean height increase of children during the 120 feeding days and normal average increase in height (WHO, 2007)

Children 5.1 to 10 yrs. old

**Male**

- Baseline (Jul 2016)
- Midline (Dec 2016)
- Endpoint (Mar 2017)

**Female**

- Baseline (Jul 2016)
- Midline (Dec 2016)
- Endpoint (Mar 2017)
Comparison of mean height increase of children during the 120 feeding days and normal average increase in height (WHO, 2007)

Children 10.1 to 19 yrs. old

Male

Female
After 120 feeding days...

4 out of 10 undernourished students attained normal status

3 out of 10 undernourished students attained normal status

Children aged 5.1 to 10 years

Children aged 10.1 to 19 years

BMI-for-age Z-score
The research conducted by Philippine Institute for Development Studies (PIDS) revealed that children who have been rehabilitated (to normal) during 120 days in-school feeding have reverted to wasting after the 2.5-month school break.
Extended Feeding Period

Feeding was continued for 80 days during the summer school break. Each sentinel school had their own strategies to gather the children for feeding.
Result of additional 80 feeding days

Compliance of daily feeding in school was between 50 and 60 days and only 12% had completed the 80 days.
Result of additional 80 feeding days

- Children aged 5.1 to 10 years, further significant increase of **0.44 kg** in the mean weight of male and **0.55 kg** among female

- Children aged 10.1 to 19 years, further significant increase of **0.75 kg** in the mean weight of male and **0.83 kg** among female
Result of additional 80 feeding days

- Children aged 5.1 to 10 years, further significant increase of 1.57 cm in the mean height of male and 1.96 cm among female

- Children aged 10.1 to 19 years, further significant increase of 1.84 cm in the mean height of male and 1.96 cm among female
Sustaining the Gains (Nutrition Education)
Nutrition information & education materials were developed and distributed.
Training Manuals & Nutrition modules empowered program implementers
Nutrition Education Modules

School-based Supplementary Feeding Training Manual

Pinalalakas ng Iron ang ating katawan!

Mga pagkaing mapagkukunan ng iron:
- May, dugo at iba pang laman-koob
- Nel na isda at karim
- Pulsa ng bago
- Whole grain cereals, adlai, panutong
- Kerin, Brown rice
- Mga busong galbiy
- Berde at malaktakang mga galbiy at talinam, makilinggap, pettoy, ut taisoy ng kumoto

Food is for Life and Nourishment!

Learning objectives:
1. Describe the role of food as nourishment and essential element in sustaining life;
2. Understand the basic food groups and its relation to daily diet and;
3. Learn how to use Pinang Pinoy for proper nutrition.

Everybody needs to eat certain amount of food to sustain life. Enjoying variety of colors, texture, flavor, and aroma engages us to eat food to nourish our body to survive, function, and live a quality life.

Good food can come from home-grown crops that can be really prepared or cooked. Local and sustainable sources of plant-based foods are highly essential to have good nutrition.

Good nutrition is the bedrock of child survival, health, and development. Well-nourished children are better able to grow and learn, to participate in and contribute to their communities, and to be resilient in the face of disease, disasters, and other global crises (UNICEF).
Iron-rich Recipes were also developed and promoted

Ginisang Togue
Tofu Balls with Sweet & Sour Sauce
Rebosadong Gulay
Bean-Squash Patties
Beef Zesty in Sauce
Fried Vegie Tuna
Corny Malunggay
Ginataang Tuna
Beans-Tok Lumpia
Pork Vegie Soup
Ginulayang Munggo
Veggie Tofu
Picadillo Malunggay
White Bean Stew
Recipe booklets equipped parents to prepare healthy & affordable food at school & home.

Iron Rich RECIPES

Lumpiáng Gulay
Yield 20 servings
Serving size 1 pc (45g)

Procedure
1. In a pan, sauté garlic, onion and pork. Cover and simmer until pork is thoroughly cooked.
2. Season with patis, soy sauce and pepper.
3. Add the carrots, kamote, pechay and kinchay. Blend well. Cover and cook for 2 minutes.
4. Remove from heat. Cool the mixture.
5. Place 2 Tbsp of the mixture on the lumpia wrapper. Roll tightly, securing both sides by moistening with water. Seal. Do the same with the rest of the mixture.
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Proven improvement in Knowledge, Attitude and Practices (KAP) of children

- Increased knowledge (65.3–76.2%) and attitude (78.2–89.1%) on the importance of having home gardens

- Improved attitude toward consumption of a variety of foods (74.1–84.4%)

- Improved recognition of the negative effects of worm infestation (68.7–84.4%)
Proven improvement in Knowledge, Attitude and Practices (KAP) among parents

- Consumption of fruits and vegetables to prevent sickness (93.9–100%)
- Importance of serving breakfast to children (42.4–78.8%)
- Having home gardens (78.8–93.9%)
- Improved attitude (51.5–66.7%) and practice (51.5–93.9%) on the purchase of fortified foods for children
- Positive attitude (63.6–93.9%) and practice (27.3–87.9%) on proper preparation and serving of fruits and vegetables
- The negative consequence of worm infestation (33.3–60.6%)
Conclusions

- Integrated model (GarNESupp) implemented for 120 days resulted to improvement in nutritional status of schoolchildren.

- Further improvement in NS was observed during the additional 80 days feeding period.

- The implementation of different nutrition education modalities have mended the disconnect of the SBFP and GPP resulting to improved implementation of the SBSP.
• Effective measures to sustain the improved nutritional status during school days should be installed during vacation breaks at the community setting.

• Gardens should be maintained for productivity and could be extended at the community level.
Recommendations

• The Integrated Approach to Implement School Nutrition Programs is effective that merits scaling up

A. Institutionalization of BIG;
B. Use of Iron Fortified rice and diverse indigenous vegetables
C. School as platform for nutrition education for children and parents
Recommendations

• Longer duration of supplementary feeding has an add-on benefits and can be considered as a policy input - partnerships
Recommendations

• The innovations in this model can be adopted to strengthen existing food and nutrition security programs:
  A. Bio-intensive approach can be practiced in household food production to improve diet diversity
  B. Crop museums can be established to conserve Philippine Agro-biodiversity
Recommendations

• Mechanisms that can be installed to ensure sustainability of the program can be achieved thru:

  A. Convergence of resources among relevant agencies
  B. Effective public-private partnership
  C. Policy development to support the implementation of the integrated model (GarNESupp)
Recommendations

• Results of this study can serve as an input to the development of the implementing rules and regulations of the Senate Bill No. 1279/ House Bill No. 5269 otherwise known as, “An act institutionalizing a national feeding program for undernourished children in public day care, kindergarten and elementary schools to combat hunger and undernutrition among Filipino Children”
The GarNeSupp is an investment.

The recommended course of actions will only cost P2,160/child/120 days feeding. This is negligible if compared with the cost of medicines and non-productive years of the undernourished child. These recommendations will be beneficial not only to children and families but also to the society as a whole.
Maraming Salamat po!