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## KEY MESSAGES FOR POLICY AND PROGRAMMING CONSIDERATION

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- Governments around the world recognize school feeding as a key response to hunger and poverty; government investment in these programs is huge – US\$ 75 billion per annum. Return on investment is substantial – for every \$1 spent by governments and donors, at least \$3 is gained in economic returns.
- In the Philippines, there is an alarmingly high rate of underweight (31%), stunting (31%) and wasting (thin) (8.4%) among our schoolchildren as revealed by the National Nutrition Survey conducted by FNRI-DOST in 2015.
- **The response of DepEd** to the undernutrition problem is the implementation of the School-based Feeding Program (SBFP). In the past, the link between feeding programs and gardening programs had been weak. Sustainability of gardening initiatives is regularly reported as a major concern, primarily because majority of gardens have relied on external inputs, which schools cannot fund on a regular basis. Nutrition education in schools for both parents and children remains a challenge in terms of time (of both teachers handling the nutrition sessions and parents attending the sessions) and capacities (technical and materials). SBFP has evolved since 1997, transitioning from addressing short-term hunger to tackling more serious issues of undernutrition. The nutrition issues and education-related objectives came along this evolution; the re-emergence of nutrition-focused programs calls for a holistic approach to respond to the multifaceted gaps in implementing the SBFP.
- **School feeding has achieved objectives that go beyond feeding the children.** It gave value to various aspects that may have strong links to nutritional outcomes; school gardening, food safety and feeding facilities, menu selection, community and barangay relations, parent participation, and school prioritization and leadership.

- **Extended feeding period is more beneficial.** The feeding period could be extended to 180 days to allow higher weight gain of children. Our study showed that extending the feeding period, even for 60 days, yielded a significant increase in weight. The extended feeding period can be done in the school if funds are released by mid June of every school year.
- **Data accuracy.** There is a need to use more accurate and standard equipment for weighing and height taking to assess properly the nutritional status of the children and assess program impact accurately. Based on our data, the use of non-calibrated weighing scales resulted in a two-to-threefold increase in the number of wasted children in school. The funds for the purchase of these tools could come from external resource generation paper in this study.
- **Linking feeding and local food production.** Feeding program using vegetables that are locally produced or sourced out accompanied by food fortification, creates synergistic effect that definitely tackles the burden and prevalence of poor nutrition and iron deficiency in children.
- **Nutrition sensitive agriculture programs.** School gardens have proven to be an excellent mechanism to promote nutrition sensitive agriculture especially if agroecological are used ensuring safe food free of residues.
- **Agroecological and low external input gardening approaches** such as the bio-intensive gardening approach are viable way to revive, restore, and eventually sustain gardens while also linking them with ongoing feeding programs. A 200-square meter garden can produce 700 kg. of vegetables per year.
- **Many of the local vegetable varieties** have been proven to be excellent sources of vitamins and minerals. Local varieties of root crops, leafy vegetables, legumes and fruit-bearing vegetables are easy to grow, tolerant to drought and pest, and do not require so much inputs. Growing these vegetables in schools and communities does not only supplement nutritional requirements of children but also conserves Philippine genetic resources.
- **Diversification of gardens** with emphasis on climate-hardy and nutritionally relevant indigenous vegetables that thrive under extreme weather conditions can improve the availability of different types of vegetables with varying nutrient contents.

- **Multifunctionality of schools.** School gardens deliver outcomes that go beyond their role in supporting school feeding. This include conservation of agro biodiversity, opportunity for food education, science and environmental education, source of safe and healthy food for the canteen and school children to take home, serve as model for community and local government and source of planting materials for communities.
- **Nutrition outcomes.** There is a need to ensure that nutrition outcomes accrue in various programs through the deliberate inclusion of nutrition outcomes or nutrition objectives within program strategies. Nutrition education both to children and parents are essential components for sustainable gains.
- **A supportive policy and administrative environment** for nutrition-sensitive agriculture program and integration of related programs helps pave the way for model building and scaling up of the integrated nutrition model. Lighthouse schools located in every school district provides evidence for local governments and regional offices.

## Project Background

A 3-year action research project (Phase 1) implemented by the International Institute of Rural Reconstruction (IIRR) and funded by International Development Research Center (IDRC) from 2012 to 2015 has identified nutrition education as the missing link. An integrated model of gardening, supplementary feeding, and nutrition education (GarNESupp) among school children in Cavite Province in the Philippines was implemented. This study has revealed the effectiveness of the model in improving the nutritional status of children; improving the Knowledge, Attitudes and Practices (KAP) both among children and parents; and sustaining the implementation of bio-intensive nutrition gardens and crop museums that aim to retrieve and conserve crop cultivars while improving year-round availability of a diverse range of climate-resilient, locally adapted, and nutritionally important vegetables.

A total of 58 public elementary schools within Region 4A were selected for the implementation of GarNESupp that features a regular school feeding program, a well-sustained bio-intensive garden, and school-based nutrition education activities. Three schools were designated as research sites. Evidence-based messages were derived. The implementation of SBFP using the integrated approach resulted in bridging the gaps between components and has brought about unique implementation strategies of GarNESupp. The integrated model is crucial in seeking lasting impacts of nutrition intervention in schools.

# Climate and Nutrition Smart School Gardens

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# CLIMATE and NUTRITION SMART SCHOOL GARDENS

## KEY FINDINGS

### METHODS

- 58 public elementary schools within Region 4A were selected for the implementation of GarNeSup model (also referred as “lighthouse schools” [LS]) where 17 are part of Phase 1. Three schools were designated as research sites.
- Factors affecting the adoption, sustainability, and scalability of the set of BIG standards, garden size, productivity per unit area, extent of crop biodiversity achieved, utilization of garden produce, use of gardens as learning laboratory, and the link between garden and feeding were studied. Survey forms and questionnaires were developed and distributed to teachers; and school visitations were conducted to support data collection.
- Descriptive analysis was employed to analyze various variables profiling the different characteristics of school gardens. The McNemar’s change test was used to analyze the adoption of the standards set in gardening before and after the intervention.

### RESULTS

- **Improved soil health.** There was an increase in the amount of nitrogen, phosphorus, and organic matter in the soil. The various soil and water conservation techniques implemented contributed to a healthy garden environment.
- **Garden diversity.** An average of 26 crops with 82% and 18% distribution of indigenous and exotic crops grown in 37 schools. Crop diversification provided a diverse food production across the year.
- **Improved yield.** An extreme range—101.07 to 818.11 kilograms was reported in the three research schools with 200-m<sup>2</sup> garden size.
- **Food source for feeding.** 21 schools showed garden produce distribution: feeding (42%); given free to parent volunteers, students, and teachers (24%); used in the canteen (17%); and sold (17%). Planning and coordination between the GPP and SBFP coordinators taking into consideration climate, season, and feeding requirements improved the utilization.
- **Potential savings.** Utilization of garden produce in feeding of around 270 kilograms can reduce feeding cost and will generate PhP0.53 per capita savings.
- **Formal integration of garden as learning laboratory.** EPP (100%), Science (100%), and EsP (93.6%) are the regular subjects that use gardens as demonstration and learning venue. Formal integration of garden as laboratory shows teaching methods that reinforce learning and improved learning.
- **Conservation of Agrobiodiversity.** Schools served as crop museums in conservation and propagation of nutritionally relevant, and climate-resilient indigenous vegetables. IEC materials contributed to familiarization and interest of parents, students, and community. Seed exchanges contributed to improved agrobiodiversity and maintenance of a diverse pool of indigenous seeds in the school districts.

## CONCLUSIONS

- A garden set of standards using the BIG approach, accompanied by capacity building and regular monitoring, can result in productive and sustainable school gardens throughout the school year.
- Maintaining crop diversity with emphasis on climate-hardy and nutritionally relevant indigenous vegetables that can thrive under extreme weather conditions can provide a diverse range of vegetables for the feeding program year-round in which can result to reduced feeding cost and can generate savings.
- Schools can serve as crop museums in conserving and propagating heritage crops; with the conduct of seed exchanges to maintain agrobiodiversity.
- School gardens are used as a platform for learning and education of nutrition and environment-related topics. Using school gardens as learning venue for education is an effective way to engage students and parents to become food and nutrition literate consumers and stewards of the environment.

## RECOMMENDATIONS

- Schools should allocate at least 200m<sup>2</sup> for school garden to provide fresh, safe, and variety of vegetables to supplement feeding activities. Coordinators have to contextualize the bio-intensive gardening standards to ensure garden sustainability and functionality.
- Formal integration of gardens as a learning laboratory in the curriculum of EPP can be expanded to Science, MAPEH and other learning areas, which can then lead to better teacher compliance in incorporating nutrition and science topics.
- The establishment of crop museums, at least one per district, is fundamental in saving the underutilized but nutritionally relevant heritage crops that are slowly diminishing. School districts should conduct seed exchanges at least once a year to improved agrobiodiversity of schools and community.
- Schools are encouraged to secure information, education and communication materials (posters, recipes booklets, etc.) from other government agencies as these captivated the interest of parents, students, the community, and nearby schools.
- Recipe development participated in by school members and the community can improve the utilization of garden produce for feeding as parents' involvement in school activities is enhanced.
- Garden teachers are tied up with their teaching load and other school activities such as sports contests, camping, and academic contests. Specific budget allocations and partnerships with stakeholders for funding and other forms of support should be considered **especially** for schools with low resources. Long term commitment and support of community members and school members is crucial to help ensure the availability of resources needed for school garden interventions.
- A multi-level capacity building, mentoring, monitoring, and evaluation should be done on a regular basis to sustain the interest of teachers and motivate them to adhere to programs of DepEd.

# School-based Supplementary Feeding: Are we gaining?

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## *School-based Supplementary Feeding: Are we Gaining?*

### *Methodology*

- A total of 7,180 students (ages 5 to 10 years) in three sentinel research schools were weighed and their height measured. Five hundred and forty-one (541) or 7.53% of the students were identified as severely wasted and wasted. These children were the beneficiaries of the School-based Feeding Program (SBFP) in SY 2015–2016.
- To determine the effects of SBFP, these children were monitored by trained research assistants. Monthly weighing and quarterly height measurements were conducted. Only 277 (51%) students had complete data on weight and height for the 120 feeding days. Forty-nine percent of the children had dropped out from the feeding (1.7%), transferred out (2.2%), and were absent during data collection (44.9%).

### *Benefits gained from the 120 feeding days*

- There was a significant increase in the mean weight ( $p$  value=0.000) and height ( $p$  value=0.000) of children, both males and females.
- The increment in mean height of the male students ages 5 to 10 from baseline to midline (after 60 feeding days) was 1.99 cm, whereas that for females was 2.05 cm. These increments are lower than the normal increase of 2.21 cm for males and 2.48 cm for females of the same age group. However, the increment from midline to endpoint (after another 60 feeding days) was 1.51 cm (males) and 1.70 cm (females), which was higher compared with the normal increase of 1.32 cm and 1.51 cm, respectively. The same result was observed among female students, ages 10.1-19 years. However, the increment in mean height of the male

students from midline to endpoint was similar (1.68 cm) to the normal increase of 1.69 cm.

- There was a significant decrease in the proportion of undernourished students aged 5.1 to 10 and 10.1 to 19 y.o. from baseline (100%) to endpoint (64.71%).
- To determine if there exist further additional benefits for extending the feeding period for another 80 days during the 2 ½-month school break, schools have continued feeding in school. Each school had different strategies to convene the children in the school.
- There were 195 out of 277 students who participated in the additional 80 feeding days after the regular 120 feeding days in the sentinel schools.

### *Results of additional 80 feeding days in sentinel schools*

- There was a further significant increase in the mean weight and height of students at the end of the 80 feeding days in both age groups and gender. The same result was also observed in the mean height of students in the older age groups and gender.
- High compliance of daily feeding in school was between 50 and 60 days and only 12% had completed the 80 days.

### *Enabling factors*

- Closer coordination between the feeding and agri-coordinators and active participation of core groups led by the initiatives of the school heads.

- Increased supply of vegetables and root crops from the school gardens for supplementary feeding through a well-planned cropping calendar.
- Different nutrition education modalities had improved the knowledge of children and parents, which had resulted in no plate waste among schoolchildren, thereby increasing vegetable consumption.
- The nutrition education activities have also built a sense of cooperation among parents to help in the feeding activities and in maintaining the vegetable gardens.
- The complementation of funds from the school canteens, school-driven fund-raising activities, and the government funds facilitated the purchase of other implements and covered the operational cost of the SBFP.

### *Opportunities for improvement*

- Delayed implementation of SBFP due to late release of SBFP funds. Canteen funds were used to start up the feeding program to cover the 120 feeding days during the school year. However, when funds are available, these are given in full to cover the 120 days. This has resulted in either double feeding just to exhaust the funds or targeting more beneficiaries but oftentimes not within the set criteria. Also, the late release of funds, from the region to the schools was a problem. Feeding is usually done from September to January or March where there are a lot of no-school days due to holidays and school breaks resulting in interrupted feeding periods.
- In densely populated schools, the feeding coordinator is over burdened by the day-to-day feeding activities because of the large number of beneficiaries. This could negatively affect the physical and quality of life of the coordinator, the quality of scholastic performance, and the overall implementation of the SBFP.

- Smaller rice servings were given to older children, while bigger servings were given to younger children.
- Recordkeeping is considered time-consuming by the feeding and school garden coordinators.

## *Conclusions*

- The SBFP implemented through the integrated model (GarNESup) resulted in a significant increase in mean weight and height among schoolchildren.
- Further improvement in mean weight and height was observed even with an additional 60-80-day feeding period.
- The implementation of different nutrition modalities have mended the disconnect between SBFP and GPP, resulting in improved implementation of the SBSP with improved nutritional status of children as visible outcome.

## *Recommendations*

- The SBFP should be implemented for at least 180 feeding days as evidenced by the significant increase in mean weight and height after the additional 80 feeding days.
- There should be timely release of funds to implement the program within the 180 feeding days under the school year.
- A memorandum on the implementation of nutrition education in schools should be issued as the study proved that nutrition education bridges the gap between gardening and feeding programs and helps achieve sustainability of the programs.
- Focused targeting resulting in obtaining standard weight and height measurement tools is necessary. This may result in lower number of

beneficiaries. Extra funds could be requested by the regions from national officials to increase the meal cost/per/child/day from P 18.00 to P 20.00 so that proper serving portions per child per day is observed.

- Strategies such as regular meetings and organized feedback mechanisms or other creative school-based approaches should be installed to sustain funding support from external sources or partners.
- Regular capability building of the feeding, agricultural, and other SBFP members of the core group should be conducted to equip them with skills on proper documentation and to update them with state-of-the-art information.

*Complete research report is accessible at <https://schoolnutritionphils.wordpress.com/>*

# Are we implementing the School-based Feeding Program the right way?

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## *Are we implementing the School-based feeding program the right way?*

### ***Methodology***

The research involved select public elementary schools in Cavite Province and in other provinces of Region IV-A. A total of 58 Lighthouse schools (LS) (40 schools in Cavite and 18 schools from Laguna, Batangas, Rizal, and Quezon provinces) were selected using purposive sampling.

The research employed both quantitative and qualitative methods. Interviewer-administered survey was conducted based on the existing SBFP guidelines of 2016 to identify program implementation practices. The survey was conducted at the start and at the end of the school year. Periodic visits were conducted in-between to provide technical guidance and monitor the status of SBFP implementation through observational data collection.

### ***Gains of the SBFP implemented as an Integrated Program***

- Generated unique practices among schools that have linked the three components nutrition education, school gardening, and school feeding.
- Fostered collaboration between focal person and school heads to sustainable outcomes.
- The implementation of the integrated school nutrition program has identified key links between components: menu, garden as learning venue, and nutrition education practices.
- Realized the value of leadership, external partnership, community relations, and parent engagement in achieving sustainable outcomes.
- Added value to school feeding programs: from “providing food to undernourished children” to “venue and bouncing board to nutrition learning”
- The implementation have given focus on nutrition; valued local vegetables and crops – increased the use of local recipes. The SBFP alone has given a different impression on school feeding, it is more than just feeding the undernourished.

## Key Findings

- Timing of the release of funds have been a factor for the efficient implementation towards completion of the 1 days feeding. DepEd has regional allocations for SBFP. School funds were released or downloaded to schools in different months along the start of the school year. 64% of the schools at baseline received the funds in October and 70% received the funds a month earlier at endline.
- The release dates of the fund also drives the feeding start date; 72% of the schools started their feeding proper in October during school year 2016-2017 and 76% started in September during school year 2017-2018.
- The use of calibrated anthropometric tools is a necessity to schools accurate data collection and identification of feeding beneficiaries. The research had found variety of brands of anthropometric tools use in schools. 74% of the schools are using bathroom scale, 17% are using beam balance or detecto and the remaining schools used varying brands alternately. 69% of the schools use tape measure to for height measurements and 20% use the same height tool that is attached to the beam balance that is used for weighing. Other remaining schools use varying tools which includes improvised methods and wall mounted poster for height measurement.
- A helper or cook had been found to be of great help for the efficient implementation of the SBFP. There are 24% to 32% of schools who have hired cook sourced from SBFP funds from baseline to endline. 28% to 17% of schools don't have hired cooks from baseline to endline. Schools relied heavily on volunteer and parent support for the daily the feeding activities.
- The teachers who are SBFP coordinators spent extra hours to accommodate the efficient implementation of the feeding. Baseline and endline data suggests that on the average teachers spent 3.6 to 3.7 extra hours on top of their teaching roles. The Highest reported extra-hours spent in SBFP activities is at 6 hours per day.
- Menu had been found to be a key driver of activities and mechanism across three components. Schools have a set of 20 recipes for their menu cycle; at baseline the composition of the menu is using 12 of its recipe is malunggay based and 8 using FNRI -based (indigenous recipe). The schools adaption of the indigenous recipe have improved at endline; on the average schools are using 10 recipes from indigenous and 10 recipes from malunggay based. Variety of recipes is necessary to the improvement of the nourishment of the children. The menu also dictates the utilization of the garden produce in the schools.
- Feeding facilities has been found to play an important role in nutrition education it came out to be one of the most feasible time to conduct nutrition education for children-more than a place for feeding. At baseline 55% of the schools have a designated feeding facility and 66% at endline.

## ***Recommendations***

- Efficient mechanism to enable the efficient and timely release of funds from the region can help achieve the completion of the desired feeding days.
- Calibrated anthropometric tools based on WHO standards should be provided to schools. Fund that is used for SBFP activities and accurate researches depends heavily on the accuracy of the SBFP nutritional assessment data.
- An additional provision of a food service worker mandated for school based feeding program can help standardized the efficient implementation and may help reduce the workload of teachers. This may also help teachers to focus on their task as an educator and better supervise the feeding activities.
- Flexibility on the selection of the standardized recipe will help schools to diversify their menu that may better suit the needs and taste of their beneficiaries. The school must be empowered to create or utilize diverse sources of produce to enable lasting impacts in the nourishment of children. The creativity in menu also served as a tool for educating the beneficiaries' parents. Diversification and variation in recipe is highly recommended.
- A school with a school based feeding program must have a school based feeding facility that is conducive for children to have their nutritious meals; it also should serve as a center for nutrition education for all the children in the school.

# Enhancing Opportunities for Nutrition Education in Public Elementary Schools in the Philippines

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## *Enhancing opportunities for nutrition education in public elementary schools in the Philippines*

### **Methodology**

- The research involved select public elementary schools in Cavite Province and in other provinces of Region IV-A. A total of 58 Lighthouse schools (LS) (40 schools in Cavite and 18 schools from Laguna, Batangas, Rizal, and Quezon provinces) were selected using purposive sampling.
- The research employed both quantitative and qualitative methods. Baseline data were collected at the start. Interviews were conducted to document the nutrition education interventions in schools prior to the implementation of the integrated nutrition model.
- As part of the research, schools were provided four types of nutrition education forms in which activities were recorded. These were undertaken during feeding, during Parent-Teacher Association meetings/conferences (PTA/PTC), and during classroom discussions. The last form was used for recording all other nutrition education activities and platforms. Records included the date, topic, and mode of delivery. This served as reference for the project team during monitoring and mentoring visits. These visits were done weekly or twice a month for sentinel schools and on a bi-annual basis for all 58 LS. In addition, key informant interviews and focused group discussions were undertaken in the sentinel schools to further explore nutrition education opportunities, challenges, and priorities.
- At the end of the research period, the same questionnaire used at the start of the research was administered again. The nutrition education records (the four forms mentioned above) maintained by each school provided additional data sources. These were consolidated to document the status of nutrition education interventions after adoption of the integrated nutrition model.

### **Key Findings**

- In Project Phase I, it has been proven that nutrition education effectively improves the Knowledge, Attitude and Practices (KAP) of children and parents towards food and nutrition:

Among children:

- improved 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 (42.8–47.6%)

Among parents:

- improved knowledge on the importance of consumption of fruits and vegetables to prevent sickness (93.9–100%), serving breakfast for children (42.4–78.8%), having home gardens (78.8–93.9%), and the negative consequence of worm infestation (33.3–60.6%)
- more positive attitude (63.6–93.9%) and practice (27.3–87.9%) on proper preparation and serving of fruits and vegetables
- improved attitude (51.5–66.7%) and practice (51.5–93.9%) on the purchase of fortified foods for children

- There are currently no guidelines or framework specific for nutrition education in schools. It was confirmed that the legal mandate requiring all institutions to participate in the nationwide nutrition awareness campaign, which happens July of every year, made it possible for schools to conduct participatory nutrition education activities.
- Thru provision of regular technical assistance, up-to-date and valid nutrition reference materials, and designation of a nutrition education coordinator, nutrition education had been done in different platforms:
  - For children, nutrition education was integrated in classroom lessons - done in 37 Lighthouse schools (LS) (67.27%), the school feeding program (41 LS or 74.55%), and garden-based learning activities (36 LS or 65.45%).
  - For parents, it was done during PTA/PTCs (37 LS or 67.27%), and during participatory activities for community and parents (46 LS or 83.64%).
- School gardens served as venues of nutrition education for students, parents and guardians in 36 LS (65.45 %) but widespread adoption of this practice can still be further popularized to more schools.

- Factors which impede successful implementation of nutrition education in schools include:
  - lack of guidelines, especially to guarantee availability of sufficient human and material resources (30.91%)
  - poor support from parent and community members (60.00%); and
  - insufficient nutrition knowledge and skills of program coordinators/implementers (29.01%)

### **Recommendations**

- Implementation of nutrition education program integrated with the School-based Feeding Program and Gulayan sa Paaralan Program to enhance synergy and sustain gains from each program
- Formulation of legal mandate and implementation guidelines on nutrition education especially on matters such as integration of nutrition in the curriculum across grade levels; capacity building of program implementers; designation of a nutrition education coordinator; online monitoring and evaluation scheme to track progress; and budget appropriation
- Maintenance of year-round diversity and functionality of school gardens to serves as learning laboratory for children and community members.

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