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SUBJECT - Project Evaluation Summary (PES) of the Philippines
Food and Nutrition Project 492-0252.
REFERENCE - AIDTO A-188

In accordance with the guidance provided in AIDTO A-188 attached herewith you will find copies of the subject PES. The PES format follows the procedure outlined in para 4(b) of refair.

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PAGE 1 OF 1 PAGES

DRAFTED BY	OFFICE	PHONE NO.	DATE	APPROVED BY:
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PROJECT EVALUATION SUMMARY
(Submit to MO/PAV after each project evaluation)

1. Mission or AID/W Office Name USAID/Philippines			2. Project Number 492-0252
3. Project Title Food and Nutrition Project			
4. Key project dates (fiscal years) a. Project (Tent. 2/75) b. Final Agreement (Final 11/77) Signed c. Final input delivered 1980 Oct. 1979			5. Total U.S. funding - life of project \$ 2.173 Million (grant)
6. Evaluation number as listed in Eval. Schedule 5	7. Period covered by this evaluation From: June 1974 TO: March 1979 Month/year Month/year		8. Date of this Evaluation Review Month/Day/Year 03/25/79
9. Action Decisions Reached at Evaluation Review, including items needing further study (Note--This list does not constitute an action request to AID/W. Use telegrams, airgrams, SPARS, etc., for action) Development of Project Paper 492-0320, Food and Nutrition Outreach to include, an addition to on-going nutrition support activities the following: ---- municipal level nutrition-oriented food production schemes to address food needs to satisfy nutritional requirements. ---- Intensified support for up-grading municipal level multi-sectoral economic development planning process with nutrition component.		10. Officer or Unit responsible for follow-up O/NUTN, USAID/Manila	11. Date action to be completed April 1979

12. Signatures:

Project Officer	Mission or AID/W Office Director
Signature: William F. Doody	Signature: Peter M. Cody

Typed Name	Typed Name
Date	Date

1. PROJECT EVALUATION SUMMARY:

a. The GOP has made considerable progress toward the establishment of a national organization (NCP/NNC) to plan, and coordinate an attack on the malnutrition problem. Further, it has been successful in bringing about a nationwide awareness of the malnutrition problem through entry into over 2.5 million homes in a child weighing program (Operation Timbang) for the purpose of identifying malnourished infants and pre-schoolers. Through this activity local governments have begun active participation, a process which still needs improvement in view of the limited capability of local staffs in development planning and implementation nutrition is now a national priority and nutrition planning has been incorporated into the development planning process in all levels of government.

b. Through grants of Title II donated foods the U. S. has made a major contribution to contain the Philippine malnutrition problem and thus provide additional time for the mustering of GOP resources needed to reduce and eliminate the undernourishment problem. Title II food assistance targeted to the most vulnerable malnourished children and pregnant or lactating mothers has brought about measurable nutritional improvement. This intervention is believed to be a major factor encouraging GOP planners to take steps to combat the nutrition problem with their own resources.

2. EVALUATION METHODOLOGY:

This evaluation comprises a summary of three evaluations as follows:

a. February-March 1978 - Technical evaluation of the Philippine Nutrition Program (PNP) by a joint National Academy of Science, AID/W committee, an evaluation which covered the scope of the PNP and USAID's role. The committee visited field sites to observe the PNP in action and extensively studied Manila O/NUTN records and reports on USAID contributions to the PNP.

b. February-May 1978 - An evaluation by an independent agency of the overall and strategy effectiveness of the Philippine Nutrition Program by Sycip, Gorres & Velayo and Co., Management Consultants, through an interview survey of 3,613 respondents representing a cross-section of program implementors and recipients. For details see Annex "A".

c. January-August 1978 - An in-house study of the effectiveness of the USAID food assistance intervention (TMCH) in reducing malnutrition among recipients through a compilation of bodyweight data on over 11,000 infants and children before and after program implementation. For details see Annexes "B" and "C".

d. These evaluations, in addition to a PAR review of the project in June 1975, constitute all evaluations which have been accomplished since the project began in 1974.

3. DOCUMENTS TO BE REVISED TO REFLECT DECISIONS:

/x/ These evaluations brought out ideas for incorporation into the the revised Food and Nutrition Outreach Project 492-0320, now being prepared. *

4. EXTERNAL FACTORS:

a. Project implementation in 1974 was accomplished by making AID resources available to a Nutrition Task Force of 18 persons operating as a special unit under the Deputy Director of the National Food and Agriculture Council (NFAC), a unit which had been established under Executive Order No. 285 dated 21 January 1971, an order which made NFAC responsible for coordinating nutrition activities in the GOP. Within a year a significant external factor emerged which had not been anticipated, namely, the establishment, through Presidential Decree 491 (July 1974) of the Nutrition Act of the Philippines as a national priority and creation of the National Nutrition Council (NNC) as coordinating body which now operates with a secretariat of 200 technical and support workers.

b. Another unanticipated external factor emerged in 1976 when Letter of Instruction No. 441 identified the specific responsibilities of each government agency in providing relief malnourished children to be identified by a massive nationwide child weighing program (Operation Timbang). This LOI also directed the NNC to proceed with establishment of a national nutrition surveillance scheme and to coordinate with ASEAN countries on possible regional surveillance and other nutrition activities. Other outgrowths of these significant external factors included development of municipal level food processing of local and PL 480 commodities into Nutripak for issue to the target malnourished child population and initiation of Barangay Nutrition Scholars and Rural Improvement Club members (village volunteers) to facilitate delivery of commodities and nutrition education on malnutrition prevention in infants.

c. Other donors such as the UN agencies (FAO, UNICEF, WFP) likewise increased their initiatives and offered food assistance as well as expertise in multi-sectoral nutrition program planning and in nutrition surveillance. UNICEF in particular as promoted the multi-sectoral approach.

d. The SGV review as well as the NAS/AID/W technical review concur in the view that evidence is at hand to indicate malnutrition prevalence may be declining despite severe inflationary trends as a result of the worldwide energy crises, an event which should have worsened rather than improved the malnutrition problem, particularly among the poor.

e. The establishment of a UN university campus at the Nutrition Center of the Philippines, the initiation of Dutch Government and FAO support to UPLB for advanced degree programs in the economics of malnutrition are further examples of enhancement of the goal of assistance to the GOP in addressing the malnutrition problem. Further, enhanced support by the Government of Australia to ASEAN countries on Protein Foods Development is another example of external factors contributing to USAID project goals.

5. GOAL/SUBGOAL:

a. The project goal was to assist the GOP in reducing the incidence and severity of malnutrition in children. A major USAID input to accomplish this was home delivery of food and education to the target population, an activity identified by the SGV evaluation as constituting 80% or more of food aid in the PNP. Addenda are attached hereto to support the view that a significant nutritional improvement occurred among recipients of such food aid and that it was a major factor in accomplishing a modest reduction in pre-school child malnutrition prevalence. It has also resulted in creating national awareness. One NEDA technician commented as follows: "USAID's major contribution to the evolution of Philippine Nutrition Policy has been in (a) highlighting the existence of the problem, (b) interest articulation and bringing the problem into the government agenda, (c) making funds available for a national nutrition program, thus initiating the policy formulation process."

6. PURPOSE:

a. The project purpose was to assist the GOP in developing administrative capability to manage an effective Philippine Nutrition Program.

Evaluation: By 1978 over 80% of the 1500 municipal mayors were submitting at least rudimentary nutrition program plans and were posting interventions to deal with the malnutrition problem as identified by the Operation Timbang (child weighing). Both the NAS/AID/W review and the SGV review noted that there is truly an extensive network at peripheral level emerging (but not organized) to deal with the malnutrition problem. Thus, in a major way the project purpose has been achieved but there are also problem

remaining. The barangay or village network for dealing with problem families in an organized way is not yet fully operational. Although mayors have submitted nutrition program plans in large numbers most are in need of upgrading.

b. Reach 1/3 of those in need.

Evaluation: The task of reaching up to 1/3 of those in need has not been accomplished, despite vigorous effort about 25% have been reached with some kind of food aid.

7. OUTPUTS AND INPUTS

a. The Manila Nutrition Office provided technical services to NNC to develop food production models as alternatives to external food aid; supported seed production centers, supported the Green Revolution Program of backyard and school gardening. Problems encountered were: many poor families do not have access to land for home gardens, non-availability of an adequate water supply, the GOP was primarily engaged in self-sufficiency in the major staples and assigned secondary priority to nutritious food crops. Instead of achieving 4.4 million home gardens as a planned output the best estimate indicates about 1.5 million families are participating in home gardening. The quantity of products produced has also been difficult to measure. It was these problems which have led to a need for re-assessment of the potential of home gardening efforts.

b. An outgrowth of support to seed production centers has improved coordination between school garden activities and orientation of school gardens for nutritional improvement. The seed centers have focused seed production on protein and energy type crops for optimum impact on the major nutrition problem in many families, namely food lack. Finally, the seed centers have in fact been major suppliers of vegetable seeds to other distributors (Bureau of Plant Industry for example).

c. Despite the shortcomings of the home food production activities the SGV review indicated that next to its information, education, and communication program, the PNP activities in gardening is more widely accomplished by recipient families than such interventions as health protection, family planning and external food assistance.

d. The Philippines has established a 15 million Peso fully equipped center for its nutrition activities. The following are

some of the major features of this program. We will not attempt to sort out the USAID inputs because our resources were intermingled with major contributions from the Philippine private and public sectors.

(1) Development of staff and facilities for creating video tape recordings on nutrition for use through the national media network and for use in promoting nutrition program activities with mobile teams (Nutri-buses).

(2) Training and equipping of Barangay Nutrition Scholars, village volunteers promoting nutrition and weighing children one day a week.

(3) The development, production and distribution of formulations for supplementary feeding (Nutripak).

(4) Publication of nutrition fact sheets to assure that uniform statistical nutrition information and guidelines are disseminated by all agencies participating in Nutrition Program implementation.

(5) A Field Manual for Barangay Health Aides. This 340-page manual was a product of an operational research effort supported by USAID to field test effectiveness of village health aides in promoting primary health care activities (See Annex D).

(6) A 7-section correspondence course entitled "Nutrition for Physicians". A detailed syllabus is attached as Annex E & F. The correspondence course material is augmented with a 127 page text "Physicians Manual on Nutrition" the first truly Filipino textbook on Nutrition (See Annex G).

(7) Brochures - 3 Fold

----- What to do if your child is malnourished.

----- How to make powdered protein supplements.

These brochures in simple terms provide the basic information required by mothers to institute remedial measures for preventing or curing malnutrition in their infants and children.

(8) Set of 7 Children's Books. The Philippines did not have its own publications directed to young children. Since the

Philippine Nutrition Program promotes feeding of the mind (mental feeding), the soul (spiritual feeding) and body (physical feeding) a set of children's book, seven in number, has been developed by the Nutrition Center Communications Department in cooperation with the new Ministry of Human Settlements. These attractive children's stories done in color on the style of comic strips all relate nutrition and other basic human needs to human interest themes unique to the Filipino culture. Six thousand copies of these books have been distributed (barangay workers, health workers, supermarkets, book stores, etc.)

(9) Private food industry or food equipment firms were induced to support full-page newspaper ads which contained the usual commercial product promotional material but also a nutrition message. This won a national prize for creative advertising in 1977.

The following is a listing of selected publications for CY 1977 with figures on distribution and use.

	<u>No. of Copies Distributed</u>	<u>No. of Readers (est.)</u>
Physicians Manual	6,000	12,000
Barangay Nutrition Manual	92,000	184,000
Correspondence Course for Physicians	2,000	-
Nutrition Fact Sheets (Annex 1)	10,000	30,000
What to do when your child is malnourished	25,000	75,000
1978 Nutrition Calendars	100,000	500,000
Instructional materials for general readership	65,000	-

8. UNPLANNED EFFECTS

a. When the Nutrition Act of the Philippines became a reality there was a need for providing a facility through which the nutrition program could operate. The Nutrition Center of the Philippines, as conceived by its Founder and President, Mrs. Imelda Romualdez Marcos, was to serve as the important center through which the private sector could be fully mobilized in support of the government effort in nutrition. Finally, the center, through its library, briefing

rooms, and communication programs was also to serve as the central depository for all pertinent nutrition information and statistics that would be needed to launch a national campaign to combat malnutrition. The center, entirely built with GOP resources and furnished with only very modest contributions from external donors (USAID provided about \$70,000 for audio-visual aid materials and equipment).

also - host govt commitment

9. CHANGES IN DESIGN OR EXECUTION:

The project is approaching its conclusion and therefore changes in design or execution apply more directly to the successor project namely, the Food and Nutrition Outreach Project. It is clearly evident that the planning process at municipal level requires strengthening and considerable resources will be devoted to training of municipal-level development workers. *

10. LESSONS LEARNED:

length of time spent 11 years - lesson similar to Incl. F. P.

a. Sustained technical inputs from a competent in-residence technician has been a major AID contribution to the GOP in counselling, advising on direction for USAID inputs.

b. Another lesson learned is that food aid, well planned and targeted, can serve as a powerful constant reminder that malnutrition is a food problem. It was the dominance of the PL 480 Title II food program overall national efforts that convinced agricultural leadership of the need for entering the nutrition program with food production support and other agricultural activities that could impact, such as the Malnutrition Prevention Intervention now being implemented nationwide by the agricultural extension service.

c. Macro level or central planning of nutrition interventions must be supported by an equal emphasis on peripheral or micro level planning. This is particularly important because the nutrition problem is multi-sectoral in origin and must be dealt with multi-sectorally.

Decentralization

recognized by?

d. The important lesson learned is that the problem must be attached at family or small community level and good planning and implementation are necessary at municipal level to insure that affordable interventions, based on local citizen's felt needs, reach to the problem.

11. SPECIAL COMMENTS OR REMARKS

a. USAID's contribution to what was described by the NAS/AID/W technical review Team as quote One of the most extensive * nutrition programs developed by any country anywhere in the world, unquote, is appreciated by Filipino counterparts. Invariably, when the NNC conducts briefings of its program, its credits USAID project inputs as major factors that led to the creation of this extensive program to deal with the malnutrition problem. Significantly, the ceremony of the signing of the Nutrition Act of the Philippines by President Marcos on July 1, 1974 was accompanied by the simultaneous signing of the USAID/NEDA Nutrition Program Agreement for 1975 by President Marcos, U.S. Ambassador Sullivan, as well as the directors of NEDA and the USAID Mission.

b. The expansion of the GOP Home and School Garden Program (Green Revolution) to encourage local community production and consumption of foods of high nutritional value was a planned output of this project. The GOP plan was expected to reach 90% of the nations elementary schools with this program and 4.4 million households during the project life. Major USAID input involved supply and materials grants (PL 480 Title II peso generations from Rice) to 24 agricultural and vocational schools to improve their capacity to produce seeds and other planting materials. On a nationwide scale the Green Revolution Headquarters has estimated that * about 1.2 million families have practiced home gardening as against a planned outreach of 4.4 million families. To what extent non-participation was related to non-availability of planting materials is also not known. Neither has it been possible to get quantitative data on calorie/protein or other nutrient yields through home gardening.

c. In eight provinces the Green Revolution initiated extensive vegetable fruit gardening by utilizing the roadsides as planting areas. A national policy decision to allow non-owner families to plant vacant lots to begetable and fruit crops also contributed to some extent to the total home/community garden effort. Despite these activities, however, results from dietary surveys have not * revealed any significant trends towards increased consumption of the more nutritious food crops which were recommended in the Green Revolution Program. During the project period the increase in retail price of protective foods (vegetables and fruits) has been much more substantial than the increase in price of cereal grains, yet there has been no evidence of a decline in consumption from dietary surveys possible due to the greater use of these foods through home or community gardens. * *Where are these located?*

d. The productivity of the school nurseries is somewhat better documented. Annex I describes the seed production experience. Even though the total production level has not been great it has been valuable as supplement to seed production efforts through Bureau of Plant Industry stations. These USAID supported nurseries at agricultural/vocational schools provided seeds not only for families and elementary schools but also made some of their production available to the Bureau of Plant Industry when their demands could not be satisfied through their own production efforts.

e. During the first five year nutrition support (1968-1973) program to the Ministry of Health, the USAID Nutrition Office provided the initiative for examining, through community body weight surveys in infants and preschool populations, the extent and origin of the malnutrition problem. These early studies established clearly that close spacing of births increased malnutrition prevalence as well as number of preschoolers in any one family. Further, these studies revealed that, because breast feeding is widely practiced, infant growth and development was normal during the first 4-5 months of life. Thereafter growth deterioration was noted as breast milk was no longer adequate and supplementary feeding was inadequate. These observations, provided the initiative for infant malnutrition prevention activities. The USAID Nutrition Office has vigorously promoted the concept that most effective way to identify malnutrition and to follow its course is to weigh infants and children serially.

f. Through technical back-stopping provided by the USAID Nutrition Office, (this program) was piloted in ten provinces by 130 rural extension workers (Home Management Technicians) in 1975-1976, each implementing the program in three barangays (villages) through Rural Improvement Clubs (RIC). The program was expanded to 24 provinces and 375 extensionists by 1978, at which time it was declared the major national project of the Agency and in 1979 an additional 600 extensionists are expanding the program nationwide. By 1983, it plans to monitor growth of infants and education mothers in 50% of all rural barangays (13,000 barangays). Thus, through AID initiative the Philippine Nutrition Program has launched, during the project period, significant preventive activity which was not even a part of the program when the USAID project support began in 1974.

g. Although there has not been an external evaluation of this malnutrition prevention effort, an internal evaluation carried out

by the Home Economics Division, Bureau of Agricultural Extension with technical support from the USAID Nutrition Office revealed that among the first group of over 1,100 infants reaching the age of 18 months, only 1% were severely malnourished against an estimated national average (Operation Timbang) of 5.8%.

NUTN:07/03/80

ANNEX "A"

"Project Evaluation Summary (PES)
of the Philippine Food & Nutrition
Project 492-0252"

Summary of a 1978 Evaluation of the Philippine Nutrition Program
(PNP) by Sycip, Gorres and Velayo Co.

Project funds supported an evaluation of the Philippine Nutrition Program by Sycip, Gorres, Velayo & Co., Management Services Division, Makati, Metro Manila. The evaluation was conducted between February-- May 1978.

The specific objectives of the evaluation were:

- To determine the overall effectiveness of the PNP in terms of accomplishment of its overall objectives, specifically the reduction in the prevalence of malnutrition as well as the degree of improvement of the target population from awareness to actual practice of nutrition concepts.
- To determine the effectiveness of strategies and their relative contribution to the overall performance.
- To pinpoint success factors or problem areas in the achievement of specific program targets.
- To evaluate the adequacy and timeliness of the support provided by the institutions involved in the PNP, such as the NNC, the line agencies, and the local government.

The evaluation included a sampling of 70 municipalities in 35 provinces. Data gather was based on person to person survey of a representative cross section of both the community recipients of PNP services and PNP implementators at all levels of the organization. On the spot weighing of children was also performed to measure program impact on the child population.

Reduction in Malnutrition Prevalence

From records maintained at national level the Operation Timbang results indicated that between 1976-77 (4.4 million subjects weighed) and 1978 (1.5 million subjects weighed) moderate and severe malnutrition increased by 2 percentage points. This analysis did not agree with a 17-province exploratory study by

- 2 -

NNC which showed that between 1975 and 1977 third degree malnutrition decreased by 8.6%, second degree increased by 4.7% and normals increased by 4.6%. NNC has frequently stated that Operation Timbang was not intended to serve as a mechanism for measuring prevalence of malnutrition. Its major function was to identify the malnourished, create awareness in the populace of the problem, and encourage local governments to initiate immediate relief measures for the severely malnourished.

The present survey, where 1976-77 child weight records were compared with their weights taken by the surveyors in 1978 (348 subjects) revealed that 49% of second and third degree malnourished subjects had improved their nutritional status while 3% had deteriorated in their status. These observations confirm the * observations of the USAID in-house evaluation of children the food assistance program supported by PL 480 Title II commodities reported in another section of this review.

The surveyor also weighed 133 normal and mildly malnourished pre-schoolers in the families which had moderately and severely malnourished subjects to learn that some deterioration had occurred. In this group 3% dropped to a severely malnourished status and 24% to moderately malnourished status. The net results being about a 15-20% reduction in combined severe and moderate malnutrition in the total pre-school child population sampled. These results suggest that the mothers responded to program directives to focus on the more severely malnourished to such an extent that others in the family suffered deterioration, a not unexpected result, particularly if supplementary feeding was limited or of short duration with the result that sustained improvement of the target children had to come by redistributing the limited family food supply.

Other strategic PNP accomplishments were summarized by the evaluators as follows:

- In 1976-77 weighing of pre-schoolers was extended to 41% of the population 4.4 million of the total of 10.8 million pre-schoolers with the major constraint cited for no greater outreach being lack of weighing scales. This represented 3.5 million families of the estimated 5.7 million families (60% of all families). This level of outreach as an organized outreach planned and executed

by the GOP, was far beyond project expectations as envisioned when the project was planned in 1973.

Direct food assistance reached 18% of the same 1500 of the general recipients surveyed, which is nearly the same as project plans as would be expected, in view of the magnitude of the PL 480 Title II support to the TMCH program, 90% of all food recipients were of this type, again in accord with project plans.

Of all strategies, nutrition information and education showed the highest degree of overall improvement of all strategies in terms of involvement by implementors outreach to recipients. General recipients were consistently aware of the priority messages on family diet and even on family planning. Awareness was translated to acceptance on nutrition messages but not so in family planning.

Food production exhibited the highest level of involvement by the general recipients of the PNP (75%), with backyard gardening practiced most widely.

Recipient involvement in health protection activities was low according to the survey with little more than half of general recipients involved, primarily immunization and deworming.

Although family planning messages awareness among recipients was evident, the very low acceptance rate suggested to the surveyors that NNC needs to reexamine the significance of this strategy in the PNP, although the role of the PNP was considered to be primarily motivation and this seems to have been effective since awareness was evident among the recipients.

As a general summary, it is of interest that the strategies most heavily supported by USAID resources in the PNP (Food assistance, Information and Education, and food production appear to have been the strategies which have achieved the greatest impact on nutritional improvement in children and in recipient involvement whereas the strategies receiving little or no USAID support (health and protection and family planning) have achieved the least overall recipient involvement.

ANNEX "B"

"Project Evaluation Summary (PES)
of the Philippine Food & Nutrition
Project 492-0252"

In-House Study: Food Assistance Outreach, Planned and Actual, and
Assessment of Nutritional Impact. The First Priority: Pre-School
Children, Infants and Mother.

Food assistance was of two types, PL 480 Title II donations and local food commodities.

The initial (1974) plan proposed to provide nutrition education and PL 480 Title II food to a target of 2.7 million recipients during the period 1974-78, 2.1 million malnourished pre-schoolers and infants and 0.6 million pregnant or lactating mothers. This was adjusted to a level of 3.3 million in 1977 when it appeared that the US voluntary agencies might be in a position to extend outreach beyond initially planned levels. The actual outreach achieved was 3.0 million recipients. Failure to achieve the revised level of 3.3 million was due to inadequate budget allocations by the Ministry of Social Services and Development for inland handling of the commodities. Nevertheless, the finally achieved outreach of 3.0 million exceeded the initial planned outreach by about 10%.

In actuality, however, there was about a 10-15% shortfall in the level of food delivered to recipients (6.6 pounds per month was actually delivered (350-kilo calories/recipient/day) whereas the planned level was 8.0 pounds (425-kilo calories/recipient/day) so if this correction is made the total food inputs planned for the program was very nearly equal to that actually delivered to recipients.

In addition to outreach achieved through PL 480 Title II donations, the GOP through its NUTRIPAK plants (Nutripak are blends of local rice, oil, legumes or fish powder) and through contributions from local resources, contributed with food outreach to the target malnourished pre-school child and mother population. These programs consisted of home-delivery of nutripaks for nutritional rehabilitation, or feedings, one or more times a week, at day care centers, mothercraft centers and the like, for periods of 2 to 6 months. These activities reached an estimated 1.4 million recipients during the project life, compared with a planned outreach of 2.4 million. Failure to achieve the planned outreach can be attributed mainly to the fact that the viability of these activities depended heavily upon local governments to provide the

required food commodities, an added burden on already very limited budgets. It could well be asked why the national government should not have been tapped for a greater share of the cost of these local commodities. The most obvious answer is that the GOP suffered a very serious balance of payments problem during this 5-year period due to the global energy crisis created by the sudden rise in price of fossil fuels, an imported energy source upon which the GOP depends for over 95% of its energy requirements. Therefore it did not appear appropriate for the government either to divert food exports (dollar-earners) to nutrition program nor to allocate limited public funds for food purchases for the nutrition program at that time. To summarize the food assistance outreach, combined foreign and local foods reached a total of 4.4 million recipients in the 5-year period, 0.88 million annually. The total target was estimated to equal about 3.8 million (2.6 million malnourished pre-schoolers or infants and 1.2 million mothers). Thus, the average outreach was 20-25% of the target.

Food assistance interventions which rely upon foreign donated commodities are well-recognized to be difficult to implement, supervise and evaluate. The food must be protected and maintained over long shipping routes, delivery schedules are often disrupted because of long-shortmen labor disputes, further, in an island country such as the Philippines, with over 400 inhabited islands, the task of maintaining coordinated food delivery schedules between sea and land, and the environmental tropical temperature and moisture hazards all operate to challenge a food-oriented nutritional delivery to a selected target population. Recognizing these difficulties, one must pay tribute to the U. S. VolAgs and their counterpart private and government agencies for achieving a food delivery and nutrition education system for nearly a million recipients a year, and at the same time operating a records and reporting system which permits evaluation of nutritional impact, namely, regular weighing of child recipients.

To satisfy itself that the program involving PL 480 donated commodities was indeed improving nutritional status among recipients, a private management consultant firm (Asia Research Organization) was employed to evaluate the program in 1974-75.

A summary of this evaluation is shown on page 5 of this Annex. Clearly, even though deficiencies were found, including 20% drop out rate, food sharing with other family members, lower food delivery level than planned, inaccuracies in record maintenance, the program was judged to be reaching the target population with great accuracy and was having a significant impact on the body weight of enrollees. The summary also shows, in tabular form a 51% reduction in severe malnutrition and a

20% reduction in moderate malnutrition among the 80% of recipients who remained in the program an average of 15 months. The tabulation also reveals that some children have worsened their nutritional status, a condition which would no doubt be corrected if the technical staff operating the program were to be augmented. In all fairness to the implementing agencies, the program has been operating with minimal technical inputs. Whereas the operational research leading to the TMCH program had indicated one technician should not be burdened with more than 1500 recipients, to allow for home visits and frequent consultations with non-responding recipient, the program has actually operated with a technician input to recipient ratio of 1 to 4000. Despite this deficiency, the nutritional response is clearly evident. In defense of operating with minimal technical supervision, it should be stated that the trade-off between better record keeping and possibly better nutritional response with more technician, as against greater outreach with less technicians so that a significant segment of the target could be reached for maximum total impact on the problem, were carefully considered in planning.

Greater outreach with minimal technical supervision was selected as the option because the food was available and the GOP was anxious to extend outreach to as large a segment of the target population as possible.

It should also be mentioned that this evaluation of nutritional impact served as the basis for developing food assistance and outreach requirements for the Philippine 5-year Nutrition Plan (1978-83), as there were no other feeding programs of comparable magnitude from which estimates could be made of the impact of food assistance interventions.

In 1977-78 an internal evaluation of the TMCH program was conducted by the Mission in cooperation with CRS, the major U.S. VolAg participating in this program and responsible for PL 480, Title II distributions. A summary of this evaluation is shown in Annex 1a. This evaluation confirms the nutritional impact noted in the independent evaluation, third degree malnutrition decreased about 50% (from 1220 cases before TMCH to 668 after TMCH) and second degree malnutrition decreased about 30% (from 6827 cases to 4605 cases). This evaluation points up the need for a more concentrated technical inputs, which should focus heavily upon preventing malnutrition from occurring in infants and provide more regular follow-up to recipients who do not respond as expected.

The Philippine Nutrition Program is only now beginning to develop a system of assessing nationwide impact on child growth of the various nutrition intervention which constitute the nationwide program for combatting malnutrition. This will consist of a sample child population weighed periodically, and derived from a national sampling of index provinces and municipalities. Therefore no completely valid methodology is available to determine whether or not the program of food assistance has reduced the malnutrition prevalence. Table 2 has presented some evidence that if the TMCH outreach and impact is extended to the nationwide problem the nationwide prevalence of severe and moderate malnutrition might have been reduced at the rate of about 2.5% per year, resulting in a reduction of about 13% over a 5-year period. Our project goal was to reduce the prevalence from 35% to 27% over the 5 year period, which was recognized as a very ambitious undertaking. The analysis on Table 2 suggests a reduction from 35% to about 30% has been achieved through the TMCH program. There is other evidence to support this. Table 5 summarizes estimates of prevalence in the period of 1969-73 and the period 1975-76. During the early 70's the malnutrition prevalence (3^o and 2^o degrees) was estimated to be 36.9% by Nutritionists in the Ministry of Health. Based on later surveys (Operation Timbang) the same workers estimated the prevalence in 1976 to have decreased to 30.6% --- a reduction of slightly over 5%. Thus, there are several pieces of evidence that there has been some reduction (13-15%) in the prevalence of malnutrition in the pre-school child population.

1. Description of the Recent TMCH Evaluation

(a) General

The USAID-sponsored supplementary feeding program has had two outside evaluation during the last 14 months. Most recently the Asia Research Organization (ARO) submitted their report of a study of the TMCH, paid for by USAID/Program Office. The study gives a national perspective of the effect of the program on the target group and compares this effect with that achieved by the GOP's Ministry of Health Mothercraft Centers.

Thirty-two centers and 960 children were included in the sample through random selection, and we can extrapolate from our findings to the program as a whole. Data were collected through interviews with mothers and Center Directors and by weighing the children.

(b) Findings

Targeting - only 4% of the children were ineligible because of age (2% below 6 months; 1% over 60 months; 1% not reported); and 9% because of weight, and of the latter nearly all were in the 0-6 month age bracket. This is an enviable record in targeting of children. However, about $\frac{1}{4}$ of the mothers enrolled were neither pregnant nor lactating.

Family participation in the program is high. 59% of sample children had other family members in the program, 27% of whom were mothers.

Visits by Outreach Workers - Most of the mothers (90%) claimed to have been visited by center workers and about 3/4 of these were visited by family planning motivators. Nutritionists visited 57%, and Mothercraft, MSSD and MOH visited 16%; 19% and 19% respectively. Researchers were unable to find any significant relationship between visits of family planning motivators and increasing intervals between births.

(c) Conclusions:

The program is reaching target group families with great accuracy, and it is having a significant impact on the weights of enrollees, especially the most malnourished while they remain in the program. Growth rate improvement is about what is expected considering the following inefficiencies:

- ... 13% of the children are ineligible because of weight or age;
- ... Dropout rate of about 20%;
- ... 41% of recipients receive less than their planned ration (6 lbs)
- ... 90% of recipients share their ration with the family;
- ... 50% of recipients use the food in two weeks or less;

These last two inefficiencies probably explain why mothercraft children responded faster than those in TMCH.

Improvements in each of these inefficiencies can be made but will require greater effort than in the past. Nutrition education should be strengthened since most mothers are exposed to education for only a few hours during the entire program. (Family planning motivators seem more aggressive in outreach than the nutritionists).

Record Keeping - Maintaining accurate weight charts and disease records has been difficult; although weights seem to be no problem the age in months is usually (67%) incorrect, invalidating the record and graph.

Growth Response - About 60% of the children are on the projected schedule of weight gain; with the best weight gains being realized by the most malnourished. In general, best gains were experienced by the 12-13 month old children.

Food Distribution - Directors of fourteen of the 32 sample centers reported problems with food delivery; 9 - delayed delivery; 5 - insufficient quantity; 3 - poor quality; 1 - high transportation cost; 4 directors said that foods were not always available.

Nearly all mothers (96%) had no complaints about food distribution.

Ration size varied widely, with 41% of sample children receiving less than 6 pounds, but about 15% receiving 10 pounds or more. ARO felt that this variation was due more to the availability of food than any other factor.

91% of the recipients share their food with the entire family, thus in 49% of the families the food was gone in two weeks, in three weeks by 72%.

**Summary of Initial and Final Nutritional Status of Participating Pre-School Children and Infants
TMCH Program**

	Initial Nutritional Status				TOTAL
	Severely malnourished N. = 139	Moderately malnourished N. = 540	Mildly malnourished N. = 139	Normal N. = 37	
Final Nutritional Status					
Severely malnourished	30	29	7	2	68
Moderately malnourished	64	309	46	12	431
Mildly malnourished	37	192	73	18	820
Normal	8	10	13	5	36

The TMCH Program: Its Impact and Planned Adjustments to Increase Impact on Pre-School Child and Infant Malnutrition

In 1978 the AID Nutrition Office in Manila initiated an in-house analysis of the impact of the TMCH program with the objective of identifying ways in which its effectiveness could be intensified. This analysis has been completed in four of the 12 regions of the country on a sample of 34 TMCH centers involving 9965 infant and pre-school children who have been in the program for an average of one year (2 to 24 months). The results of the analysis are summarized in Table 1. The two-way table reveals not only the nutritional improvement of the majority of participants but also the nutritional deterioration of a minority. The net result is approximately a 50% reduction in severe (3^o degree) malnutrition and a 30% reduction in moderate (2^o degree) malnutrition as measure by body weight for age^{1/}. The results will be discussed in more detail below.

A. Impact on Malnutrition in terms of the nationwide problem

Table 2 summarizes the impact of the TMCH program on the prevalence of severe (3^o degree) malnutrition in infants and pre-schoolers, using the current enrollment level and the results of the in-house evaluation shown in Table 1. After correcting for population growth, the current program is estimated to reduce severe malnutrition at a rate of about 2.8% annually.

Table 3 summarized the analysis which reveals that the current enrollment level, if implemented as effectively as the sample shown in Table 1, is estimated to reduce moderate malnutrition by about 2.5% annually.

The Analysis of the combined impact on moderate and severe malnutrition is shown in Table 4.

With current enrollment and impact predictions derived from this in-house analysis of the TMCH program, it is estimated that an annually reduction of 2.55% in moderate and severe malnutrition can be expected.

Table 2, 3 and 4 also contain estimates of the TMCH impact on the malnutrition problem if enrollment were to be increased to twice

^{1/} This in-house evaluation of the TMCH program in terms of impact on malnutrition is a confirmation of a similar evaluation conducted in 1974 by an external consultant (Asia Research Organization).

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the current level. These reveal approximately an 8% annual reduction in malnutrition prevalence.

The TMCH program has been the largest outreach program of any of the interventions aimed at pre-schoolers in the Philippine Nutrition Program and has been operable since 1971. The Pre-Timbang (Operation Weigh) body-weight surveys conducted by Health Ministry and CRS Nutritionists in the early 1970's revealed that 2^o and 3^o malnutrition prevalence was about 35%. Operation Timbang (1975-76) revealed that prevalence had decreased to about 30%. This improvement which occurred despite severe inflationary problems in 1974 as a result of the energy crisis, is no doubt in large measure due to the impact of the TMCH program. In 1974 the consumer price index rose 34.3% and a major share of this increase was in food prices.

B. Impact of the TMCH Program on Infant Malnutrition

This analysis is based on data collected in 34 centers in four regions and the total sample includes 9965 child recipients (Table 1). Of these 9965, 481 were normal and 1437 were mildly malnourished (1^o) for a total of 1918. These are assumed to be infants since only infants are eligible under these categories. There are also some infants in the more severely malnourished (2^o and 3^o) categories. An estimate of the number of infants in categories 2^o and 3^o was obtained by applying malnutrition prevalence data from a body weight survey conducted in Bulacan in a TMCH program. In that survey 23.3% of infants in the age range 6-11 months were in categories 2^o and 3^o and 76.7% were in categories N and 1^o. Thus, the total number of infants estimated to be in the sample of 9965 recipients is 2499 of which 581 are categories 2^o and 3^o and 1918 are categories N and 1^o. Thus, an estimated 25 per cent of child recipients are infants.

Since only infants 6-11 months of age are enrolled, as against 12-60 month old pre-schoolers, one could assume the infant enrollment should average about 1/9 of total enrollment. However about 90% of infants are eligible under the guidelines where as only about 35% of the pre-schoolers are generally in categories 2^o and 3^o and thus qualify. Thus, about 25% of initial enrollees are expected to be infants.

Program guidelines also specify that every three months, when food ration call forwards are prepared, all new infants in the community who have reached age six months should be enrolled. Thus, in one year, the estimated infant enrollment should have been increased considerably above the 25% level observed in the evaluation. It can readily be calculated that infant enrollment should reach at least 40% of total enrollment in one year.

Thus, it appears important that greater attention be given to enrollment expansion to infants on a regular basis each quarter after a TMCH program is initiated.

Further, it would appear important also to intensify mother education on infant nutrition and care and supplementary feeding. It is disturbing for example to note that of the 1918 normal or 1^o infants in the program (Table 1) 651 deteriorated to lower nutritional status categories 2^o and 3^o. This means that 34% of infants became malnourished while receiving supplementary food, a prevalence higher than the national malnutrition prevalence noted in Operation Timbang. If this apparent nutritional failure could be corrected through more intensive mother education the overall effectiveness of the TMCH program would be improved considerably.

C. Plans for Improving Impact of the TMCH Program

It should be emphasized that when the TMCH program was initially planned it was recommended that enrollment be restricted to 1200-1500 enrollees per professional nutritionist. This was determined to be the maximum number for effective record keeping and for effective delivery of nutrition, health and related education to the mothers of enrolled children. This ratio of enrollee to professional worker is currently about 4500:1 or three times the number of enrollees planned. This has been tolerated because the program was producing a demonstrable impact. However, it is now planned by the major implementing agency (CRS) to increase professional staff to a level of one per 1500-2000 enrollees. This should make it possible to intensify mother education, and intensify regular enrollment of infants measures deemed essential in order to improve the malnutrition preventive aspect of the program in infants.

CRS has also employed an agronomist in order to intensify its home-garden promotional program among recipient families.

SUMMARY:

Although the TMCH program has impacted on the malnutrition problem, improvements in implementation now planned should bring about an improvement in performance, particularly among infants.

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Is there any evidence of an impact of the Philippine Nutrition Program on pre-school child malnutrition?

Between 1968 and 1973 the Ministry of Health conducted surveys throughout the Philippines (except Region IX) in its Mothercraft Program and its involvement in the TMCH program. These surveys were usually conducted or supervised by trained nutritionists. A total of 97,728 children were weighed.

Between 1974 and 1976 the NNC initiated Operation Timbang. In this program the same group of nutritionists in the Ministry of Health were assigned the responsibility of conducting weight surveys. A total of 4,131,979 children were weighed.

The results of these two surveys are summarized in Table 5. The combined prevalence of third degree and second degree malnutrition in the period 1968-1973 averaged 36.9% of the total pre-school child population. In 1974-76 it averaged 30.6 -- a decrease of 6.3 percentage points, or a 17% reduction in malnutrition prevalence. There is striking similarity between the prevalence of malnutrition among the regions. For example, regions 4, 10 and 11 are among 3 or 4 regions with lowest malnutrition prevalence in both surveys. Regions 1, 3, and 6 are among the 3 of 4 regions with highest malnutrition prevalence in both studies.

The program which, through an independent evaluation has been shown to have a significant impact in reducing malnutrition prevalence is the TMCH program. It is also the program that has probably had a greater outreach than any other, reaching over 400,000 pre-schoolers annually since 1973. Additionally, Mothercraft Centers, Day-Care Centers, and Nutrition Education Program have no doubt made some impact. Note that Region 5 had a very high prevalence in 1968-73 and a major reduction in 1974-76, an average change of 15.3 percentage points. Region 5 has an excellent TMCH Program in which government sector and the private sector (church) cooperate fully and the nutritionists share the same office in the private and public sector.

Table 1. Evaluation of TMCH Impact

Nutritional status after TMCH	Totals	Nutritional Status before TMCH ^{1/}			
		3 ^o	2 ^o	1 ^o	N
	9,965	1,220	6,827	1,437	481
3	668	387	249	27	5
2	4,605	598	3,388	536	83
1	4,017	191	2,793	767	266
N	675	44	397	107	127

1/ 3^o = 60% or less of standard weight for age

2^o = 61-75% of standard

1^o = 76-90% of standard

N = 91% or above standard

2/ The data were collected from 32 centers in four regions of the country. The centers had been operating from 2-24 months or an average of one year.

Table 2. Analysis of the TMCH Impact in Terms of the nationwide problem of severe (3⁰) malnutrition

	<u>Current Program</u>	<u>Impact if Program is doubled</u>
A. TMCH Sample Size	9,965	
B. No. in 3 ⁰ before TMCH	1,220	
C. % in 3 ⁰ (B ÷ A x 100)	12.24	
D. Total TMCH Outreach annually	750,000	
E. Total TMCH Outreach annually (child)	562,500	1,125,000
F. Total No. 3 ⁰ reached by TMCH (C x E)	68,850	137,700
G. No. in 3 ⁰ after TMCH (sample)	668	
H. % of Sample (G ÷ A x 100)	6.70	
I. Reduction in 3 ⁰ No.	552	
J. Reduction in 3 ⁰ % (I ÷ A x 100)	5.54	
K. Estimated No. of 3 ⁰ cases rehabilitated (E x J)	31,163	62,326
L. Estimated No. of 3 ⁰ cases in country	554,860	554,860
M. Estimated Reduction in 3 ⁰ cases from TMCH % (K ÷ L x 100)	5.62	11.24
N. Estimated population growth rate, %	2.80	2.80
O. Net impact of TMCH annually on 3 ⁰ prevalence, %	2.82	8.44

Table 3. Analysis of the TMCH Impact in Terms of the nationwide problem of moderate (2^o) malnutrition

	<u>Current Program</u>	<u>Impact if Program is doubled</u>
A. TMCH Sample Size	9,965	
B. No. in 2 ^o before TMCH	6,827	
C. % in 2 ^o (B ÷ A x 100)	68.51	
D. Total TMCH Outreach annually	750,000	
E. Total TMCH Outreach annually (child)	562,500	1,125,000
F. Total No. 2 ^o reached by TMCH (C x E)	385,369	770,738
G. No. in 2 ^o after TMCH (Sample)	4,605	
H. % of sample (G ÷ A x 100)	46.21	
I. Reduction in 2 ^o No.	2,222	
J. Reduction in 2 ^o % of sample (I ÷ A x 100)	22.30	
K. Estimated no. of 2 ^o rehabilitated (E x J)	125,438	250,876
L. Estimated no. of 2 ^o cases in country	2,372,505	2,372,505
M. Estimated reduction in 2 ^o cases from TMCH, % (K ÷ L x 100)	5.29	10.58
N. Estimated population growth, %	2.80	2.80
O. Net impact of TMCH on 2 ^o prevalence, %	2.49	778

Table 4. Analysis of the TMCH Impact in Terms of the nationwide problem of moderate (2^o) and severe (3^o) malnutrition

	<u>Current Program</u>	<u>Impact if Program is doubled</u>
A. TMCH Sample Size	9,965	
B. No. in 2 ^o and 3 ^o before TMCH	8,047	
C. % in 2 ^o & 3 ^o ($B \div A \times 100$)	80.75	
D. Total TMCH outreach annually	750,000	
E. Total TMCH outreach annually (child)	560,500	1,125,000
F. Total No. 2 ^o & 3 ^o reached by TMCH ($C \times E$)	454,219	908,438
G. No. in 2 ^o & 3 ^o after TMCH (sample)	5,273	
H. % of Sample ($G \div A \times 100$)	52.92	
I. Reduction in 2 ^o &3 ^o No.	2,774	
J. Reduction in 2 ^o &3 ^o % of Sample ($I \div A \times 100$)	27.84	
K. Estimated No. of 2 ^o &3 ^o rehabilitated ($E \times J$)	156,600	313,200
L. Estimated No. of 2 ^o &3 ^o in country	2,929,365	2,929,365
M. Estimated reduction in 2 ^o &3 ^o cases from TMCH, % ($K \div L \times 100$)	5.35	10.70
N. Estimated Population growth, %	2.80	2.80
O. Net impact of TMCH on 2 ^o &3 ^o prevalence, %	2.55	7.12

Table 5: Prevalence of 3^o and 2^o
Malnutrition Among Pre-School Children

	<u>1/</u> 1968-73			<u>2/</u> 1974-76			Change %
	3 ^o %	2 ^o %	Total %	3 ^o %	2 ^o %	Total %	
All regions	6.5	30.4	36.9	5.8	24.8	30.6	- 6.6
Region 11	6.2	26.0	32.2	3.8	21.1	24.9	- 7.3
Region 10	5.7	21.7	27.4	5.2	23.0	28.2	+ 0.8
Region 8	5.8	27.9	33.7	7.9	28.4	36.3	+ 2.6
Region 7	5.1	33.2	38.3	4.8	22.2	27.0	- 11.3
Region 6	7.9	33.5	41.4	8.3	30.7	39.0	- 2.4
Region 5	8.1	37.8	45.9	6.0	24.6	30.6	- 15.3
Region 4	5.6	29.4	35.0	4.9	24.3	29.2	- 5.8
Region 3	7.3	32.9	40.2	6.7	25.6	32.3	- 7.9
Region 2	6.1	29.0	35.1	5.6	23.7	29.3	- 5.8
Region 1	6.6	32.0	38.6	5.7	25.3	31.0	- 7.6

1/ Ministry of Health data, Mothercraft Nutrition Program.

2/ Ministry of Health data, Operation Timbang.

ANNEX "C"

"Project Evaluation Summary (PES)
of the Philippine Food & Nutrition
Project 492-0252"

The Second Priority: Elementary School Age Children

Were it not for two considerations, the ease of delivery to a school child population and a supporting outreach to rural low income populations to protect nutritional gains achieved in pre-school food programs, there would not be a strong interest in supporting a food assistance program in elementary schools. The fact that 85-90% of children aged 7-14 years are classified as underweight for age or frankly malnourished (these constitute about 15% of the total) also makes it logical to justify food assistance for essentially all of the elementary grades pupils.

The PL 480 Title II food item used in this program, soy-fortified wheat flour, is conveniently converted to a ready-to-eat snack food, the nutribun, a hefty hamburger bun, an enlarged image of the popular snack food, a small bun known as pan de sal locally, by contracting with local bakers or through bakeries constructed, through self-help at the school site. These processing and delivery costs, in addition to local ingredients (sugar, oil, yeast and salt) generally constitute no more than 30 or 35% of the value of the raw commodity, thus making nutritious product available for direct consumption in the classroom at a relatively low cost as well as eliminating the need for a school kitchen and costs associated with a school cafeteria service. All of these factors were considered in developing the program and through agreements participating schools assumed the cost of local ingredients (about 18% of total) and processing costs.

Although initially planned for phase-out during the 5-year period (from 1.3 million recipients in 1974 to 650,000 by 1976, to none by 1978), when it appeared that commodity availability would improve in 1975, the planned schedule was revised to a total outreach of 6.2 million over the 5-year period or an average of about 1.2 million per year. Thus, the outreach through nutribuns increased from an initial planned outreach level of 3.1 million to twice that level.

Through schools that could afford hot lunch programs, the GOP estimates it reached an additional 3.5 million pupils (ave. of 0.9 million per year) between 1975-78 with from one to five hot lunches per week per pupil. The caloric value of this program per pupil daily is difficult to ascertain but generally it has consisted of

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probably no more than 100-150 kilo-calories per pupil per day in the form of a soup which usually contains the vegetables produced in the school garden.

Additionally, during the period 1975-78 the schools receiving PL 480 Title II assistance were required to provide an equivalent food snack to that of the nutribun (250-300 kilo-calories) one day a week. The extent to which this was accomplished has again been difficult to measure. Thus, through school feeding approximately 9.3 million pupils were reached during the 5-year period with school snacks varying from 100-300 kilo-calories per pupil per day. This is nearly one million above the initially planned level of 3.1 million through external food assistance and 5.4 million through local self-help.

It is more difficult to assess the nutritional impact of school age children through body weight measurements than it is with pre-schoolers because of the declining rate of growth. Further, in this age group the growth spurt associated with adolescence further complicates the measurement, particularly since this varies with age depending upon nutritional state. Nevertheless, the USAID Nutrition Office provided technical consultations to the Ministry of Education and Culture and CARE to determine or not there was a detectable impact of the nutribun program on body weight of recipient pupils.

Annex 2 summarizes an evaluation conducted in 1974-75 in 45 selected elementary schools. It reveals (Table II) that on the average pupils improved their weight as percent of standard nearly one percentage point, a rate of improvement comparable to that observed by the Japanese Health Ministry in its school lunch program evaluation in the two decade span 1948-68. During that period Japanese schoolchildren improved their bodyweight, as % of standard, at the rate of approximately 1% a year, moving from 80% of standard to 100% of standard in 20 years. The Japanese Program has often been cited as one of the most significant child health improvement programs in recent times.

Annex 2 also reveals (Table III) that the growth improvement increased as the number of feeding days increased.

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In the 45-school evaluation there were no control schools included. Therefore some additional evaluations were conducted: Table 1 of Annex 2a reveals that nutribun + school vegetable filler produced considerably better improvement in body weight than was observed among pupils from four schools without a school snack program.

There is evidence that the nutribun school snack program is improving the growth and development of participating pupils.

The total outreach of the nutribun school snack program; approximately 1.2 million pupils each year, does not constitute more than about 12% of the total elementary school age population.

One aspect of this program which deserves mention is that perhaps the most needy of the children in this age group are probably not being reached because they constitute the out-of-school youth, either never having attended or dropping out after only a few years. This is a valid criticism. Some attempts were made to provide nutribun daily to the out-of-school youths in some locations in the Metro Manila area, but resource allocations for implementing such a program in the rural areas have not been forthcoming.

THE NUTRITIONAL IMPACT
OF NUTRIBUN FEEDING

An evaluation
in forty-five selected Philippine
elementary schools
1974-75

A C K N O W L E D G E M E N T

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2. Director of Elementary Education, Dr. Liceria Brillantes Soriano, for her continued interest and concern in promoting the general welfare of the school children thru the school nutrition program.
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6. Regional Directors, superintendents of schools and local school administrators, including regional and provincial coordinators, for their active participation in the successful implementation of the evaluation activities in their respective regions and divisions.
7. Finally to the classroom teachers who have rendered their technical expertise in order that this evaluation may produce meaningful results.

APPENDIX A

List of the 45 Pilot Schools involved in the evaluation of the Philippines-
CARE School Nutrition Program.

<u>REGION</u>	<u>NAME OF SCHOOL</u>	<u>MUNICIPALITY - SCHOOL/CITY/DIVISION</u>	
I	1. Vintar Central School	Vintar	Ilocos Norte
	2. Sta. Catalina Elementary	Sta. Catalina	Ilocos Sur
	3. Agoo West Central	Agoo	La Union
	4. Fort del Pilar Elementary		Baguio City
	5. Tuba Central	Tuba	Benguet
	6. Twin Peaks Elementary	Tuba	Benguet
	7. Paoad Elementary	Paoad	Benguet
	8. Binmaley Elementary	Binmaley	Pangasinan I
	9. Villasis Central	Villasis	Pangasinan II
II	10. Penablanca Central	Penablanca	Cagayan I
	11. Ballesteros Central	Ballesteros	Cagayan II
	12. Kiangnan Central	Kiangnan	Ifugao
	13. Tumawini North Central	Tumawini	Isabela
	14. Bonfal Elementary	Bonfal	Nueva Vizcaya
III	15. Cojuangco Elementary	Paniqui	Tarlac
	16. Gapan North Central	Gapan	Nueva Ecija
	17. Camp Tinio Elementary		Cabanatuan City
IV	18. Boac North Central School	Boac	Marinduque
	19. T. M. Kalaw Elementary		Lipa City
	20. Victor de Guia Memorial	Pangil	Laguna
	21. Bagumbayan Elementary		San Pablo City
	22. Santolan Elementary	Pasig	Rizal
V	23. Tulay na Lupa Elementary	Labo	Camarines Norte
	24. Calabanga Pilot	Calabanga	Camarines Sur
	25. Malilipot South Central	Malilipot	Albay
	26. Jose Alindogan Elementary	Juban	Sorsogon
	27. Virac Pilot	Virac	Catanduanes

Appendix A (continued)

<u>REGION</u>	<u>NAME OF SCHOOL</u>	<u>MUNICIPALITY - SCHOOL/CITY/DIVISION</u>	
VI	28. Ivisan Elementary	Ivisan	Capiz
	29. Buenavista Elementary	Buenavista	Guimaras
	30. New Lucena Elementary	New Lucena	Iloilo
	31. Molo Elementary		Iloilo City
	32. J. L. Araneta Elementary	Bago City	Negros Occidental
VII	33. Lipata Elementary	Minglanilla	Cebu
	34. Pusok Elementary		Lapu-Lapu City
	35. Loon South Central	Loon	Bohol
VIII	36. Catarman East Central	Catarman	Northern Samar
	37. Calbayog City Pilot Central		Calbayog City
	38. Mercedes Elementary	Catbalogan	Samar
IX	39. Dipolog West City Central		Dipolog City
	40. Dapitan City Central		Dapitan City
X	41. Mainit Elementary	Mainit	Surigao del Norte
	42. Macabalan Central		Cagayan de Oro City
XI	43. Mintal Elementary		Davao City
	44. Maco Central	Maco	Davao del Norte
XII	45. Malungon Elementary	Malungon	South Cotabato

AN EVALUATION OF THE NUTRITIONAL IMPACT OF
NUTRIBUN FEEDING IN FORTY-FIVE SELECTED
PHILIPPINE ELEMENTARY SCHOOLS

INTRODUCTION

Recognizing that better nutrition is essential for the proper health and growth of many Filipino elementary school children, the DEC (Department of Education & Culture) and CARE (Cooperative for American Relief Everywhere) introduced a NUTRIBUN feeding program in the school year 1970-1971. From mid-June 1973 until the first week of March 1974, a project was undertaken to evaluate the extent of malnutrition at the beginning of the year and to note nutritional improvement, if any, at the end of the year.

CARE donated the WSB (Wheat Soy Blend) commodities and some ovens and DEC took charge of shipping the commodities, preparation of the CARE NUTRIBUN and classroom feeding by utilizing local school teachers. The CARE NUTRIBUN is made of soy wheat flour and weighed 170 grams. It provided 500 Calories and 17 grams of protein. Protein and Calories are frequently the two major nutrients in short supply in the Philippine diet.

METHODOLOGY

Forty-five schools in eleven regions of the country were selected for participation in the evaluation project. This involved 31,006 children of which 27,826 had complete weight records. The criteria for selection of these schools were:

1. The school was a participant in the CARE NUTRIBUN feeding program the last 2 years.
2. The school enrollment was 300 or more.
3. The local school officials and teachers expressed willingness to participate in the project.

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The Chief of the School Health Division of DEC acted as the overall coordinator of the project. Supervision of the activities in the regions was the responsibility of the Medical/Dental General Office Supervisors. At the provincial level, either the Division School Physician, Division Dental Supervisor or the Division Nutrition Coordinator supervised the implementation of the project by the school principal and classroom teachers.

At the start of the project and quarterly thereafter, the children were weighed with minimal clothing and barefeet to the nearest 0.1 kg on a "Detecto" clinical scale. The age of the child was computed to the nearest month by subtracting the child's birthdate from the date of weighing. The nutritional status of the child was then determined using the Individual Growth Chart (Student Nutrition Chart). This chart was devised by the Food for Peace Division of the United States Agency for International Development and based on the Iowa Growth Standards. The chart is divided into 4 colored zones. The bottom red zone indicates malnutrition. The second to the bottom yellow zone suggests underweight. The line that divides the red and yellow zones is approximately $2/3$ of the Iowa Standards. The third from the bottom white zone is between 90% and 110% of the standard weight for age. Any child whose weight falls in the upper green zone is considered overweight. (See Chart in Appendix)

An attempt was made to feed each child a CARE NUTRIBUN five days a week, Monday through Friday, excluding holidays. Records were kept by the teachers on the number of feeding days of each child. The CARE NUTRIBUN was prepared in various school and commercial bakeries using a standardized recipe.

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RESULTS AND TABLES

TABLE I

Percent distribution of children according to nutritional zone before and after CARE NUTRIBUN feeding by sex.

S E X	: No. of : :Children:	Red Zone		Yellow Zone		White Zone		Green Zone	
		: Before:	: After:	: Before:	: After:	: Before:	: After:	: Before:	: After
M	: 13,923 :	: 41.5 :	: 36.7 :	: 54.3 :	: 57.5 :	: 3.8 :	: 5.2 :	: 0.4 :	: 0.6
F	: 13,903 :	: 35.0 :	: 29.3 :	: 57.8 :	: 60.7 :	: 6.5 :	: 8.9 :	: 0.7 :	: 1.1
Both	: 27,826 :	: 38.3 :	: 33.0 :	: 56.0 :	: 59.1 :	: 5.2 :	: 7.1 :	: 0.5 :	: 0.8

At the start of the feeding project 38.3% of the children were malnourished, 56% were underweight and only 5.2% were normal in weight for their age. After CARE NUTRIBUN feeding the figures for these nutritional zones were 33.0%, 59% and 7.1%, respectively. For the whole group of children, this indicates nutritional improvement. The table further shows that more boys (41.5 before and 36.7 after) than girls (35.0 before and 29.3 after) were malnourished.

Growth response of the children to the feeding program was obtained by calculating their weights as percent of standards. Statistically, the Wilcoxon Signed Rank Test was used to analyze the data obtained.

Table II Mean Weights of Children as Percent Standard
Before and After CARE NUTRIBUN Feeding by Grade, By Sex.

GRADE	Children		Weight (% Standard)		
	Sex	No.	Before	After	Gain
Grade I	M	2697	73.7	73.6	+0.5
	F	2562	73.0	73.4	+0.4
	Both	5259	73.0	73.5	+0.5
Grade II	M	2611	73.5	73.5	0.0
	F	2576	72.8	73.3	+0.5
	Both	5187	73.1	73.4	+0.3
Grade III	M	2412	71.6	72.1	+0.5
	F	2420	72.6	74.0	+1.4
	Both	4832	72.1	73.0	+0.9
Grade IV	M	2311	72.5	72.9	+0.4
	F	2370	73.6	75.0	+1.4
	Both	4681	73.0	73.9	+0.9
Grade V	M	2158	72.5	73.4	+0.9
	F	2151	75.1	77.3	+2.2
	Both	4309	73.7	75.3	+1.6
Grade VI	M	1734	73.3	74.9	+1.6
	F	1824	77.2	79.1	+1.9
	Both	3558	75.2	77.0	+1.8
Total/ Average	M	13923	72.7	73.3	+0.6
	F	13903	73.8	75.1	+1.3
	Both	27826	73.2	74.1	+0.9

Table II indicates a gradual improvement in weight by grade with the CARE NUTRIBUN feeding from 0.3 to 1.8% standard gain. Girls (1.3% standard) showed a larger gain than boys (0.6% standard). The larger gains in the upper grades might be due to increased nutrition knowledge gained by students in the classroom along with the CARE NUTRIBUN feeding. Health education is a part of all school health projects in the Philippines.

TABLE III
 AVERAGE PERCENT STANDARD DISTRIBUTION FOR WEIGHT OF CHILDREN ACCORDING TO
 NUTRIBUN INTAKE BY AGE BEFORE & AFTER FEEDING

A G E	Total No. of Pupils	NO. OF FEEDING DAYS											
		0 - 39		40 - 79		80 - 119		120+					
		No. of Pupils	Ave. % Stand Before	Ave. % Stand After	No. of Pupils	Ave. % Stand Before	Ave. % Stand After	No. of Pupils	Ave. % Stand Before	Ave. % Stand After			
6 to 6-11	125	1	80.2	81.0	5	72.54	70.20	78	78.09	78.80	41	75.85	76.81
7 to 7-11	290	-	-	-	16	71.51	72.43	181	74.72	75.15	93	73.99	73.97
8 to 8-11	312	2	71.25	70.50	21	72.07	72.53	192	74.16	74.08	97	72.88	73.77
9 to 9-11	311	3	71.43	69.36	12	77.00	79.14	195	73.39	74.31	101	72.65	73.40
10 to 10-11	295	1	64.7	67.1	15	76.88	76.44	173	71.48	72.39	106	71.51	72.95
11 to 11-11	293	5	76.94	81.10	24	72.14	73.09	160	75.32	76.67	104	72.46	73.95
12 to 12-11	183	3	69.00	69.73	10	70.30	68.97	104	73.75	75.25	66	71.80	72.88
13 to 14	31	1	66.3	64.5	3	68.33	67.90	18	68.82	69.31	9	74.3	73.88
GRAND TOTAL	1,840	16			106			1101			617		
Ave. % Std.			<u>72.48</u>	<u>73.53</u>		<u>72.99</u>	<u>73.37</u>		<u>74.02</u>	<u>74.77</u>		<u>72.80</u>	<u>73.74</u>
Ave. % Std. gain						<u>0.38</u>			<u>0.75</u>			<u>0.94</u>	

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TABLE III

This data was gathered from a 10% random sample from 35 of the 45 evaluation schools with complete data on CARE NUTRIBUN intake.

This table shows that the higher the CARE NUTRIBUN intake the better was the response of the child as seen by the corresponding increase in the average percent standard gain - 0.38% in the 40-79 feeding group, 0.75% in the 80-119 feeding group and 0.94% in the 120 or more feeding group. The 0-39 feeding group was not included in the analysis since there were very few children (16) that fell under this category.

The average number of feeding days in the schools was 120, with a range of 71-165, although there were children who actually had only 11 feeding days while others had as many as 167 feeding days. The number of feeding days in some areas were altered either due to suspension of classes or lack of commodity. In the case of individual children, some were absent due to illness or other reasons. Even when a child received the CARE NUTRIBUN regularly, it did not mean that he ate it all. Since it was of a generous size, some children took it home to share with other family members.

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DISCUSSION

Even when weight gain was not significant there might have been other benefits from the CARE NUTRIBUN feeding. It could have saved some low income parents the money they usually spent on the children's snacks and allowed them to buy more food for the family. The CARE NUTRIBUN could have been more nutritious than the usual snack. Vitamin and mineral deficiencies might have been eliminated and general health improved. Since some children did not eat breakfast or snacks before lunch, the CARE NUTRIBUN appeased the pangs of hunger. After feeding some children are more mentally alert in the classroom.

CONCLUSION

It appears that supplementation of the children's diets with CARE NUTRIBUN improved their nutritional status, as is evidenced by the reduction of the number of malnourished children by almost 14%, the increase of those in the normal zone by about 36% and the overall average increase of about 0.9% in weight as compared with the standard.

According to Tables III and IV there is a positive correlation between the regularity of feeding and the weight gain.

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TABLE IV

AVERAGE PERCENT STANDARD DISTRIBUTION FOR WEIGHT
OF CHILDREN BY AGE IN RELATION TO THE PERCENTAGE
OF CHILDREN WITH 120 FEEDING DAYS OR MORE.

A G E	'Total 'No. of 'Pupils'	Weight (% Standard)			'Percentage of 'Children with 120 'Feeding Days or More
		Before	after	gain	
6	125	77.15	77.82	0.67	32.26
7	290	74.31	74.62	0.31	32.07
8	312	73.60	73.86	0.26	31.09
9	311	73.27	74.15	0.88	32.48
10	295	71.74	72.78	1.04	35.93
11	293	74.07	75.49	1.42	35.49
12	183	72.78	73.96	1.18	36.07
13-14	31	70.28	70.35	0.07	26.67
TOTAL	1,840				

The table was also compiled for the 10% random Sample as in Table III.

A Rank Correlation Test made between the percent standard weight gain and the percentage of children with 120 feeding days or more was highly significant. This would indicate a positive relationship between the weight gain and the regularity in the feeding.

Figure A - PERCENT DISTRIBUTION OF CHILDREN ACCORDING TO NUTRITIONAL ZONE BEFORE AND AFTER NUTRIBUN FEEDING, BY SEX

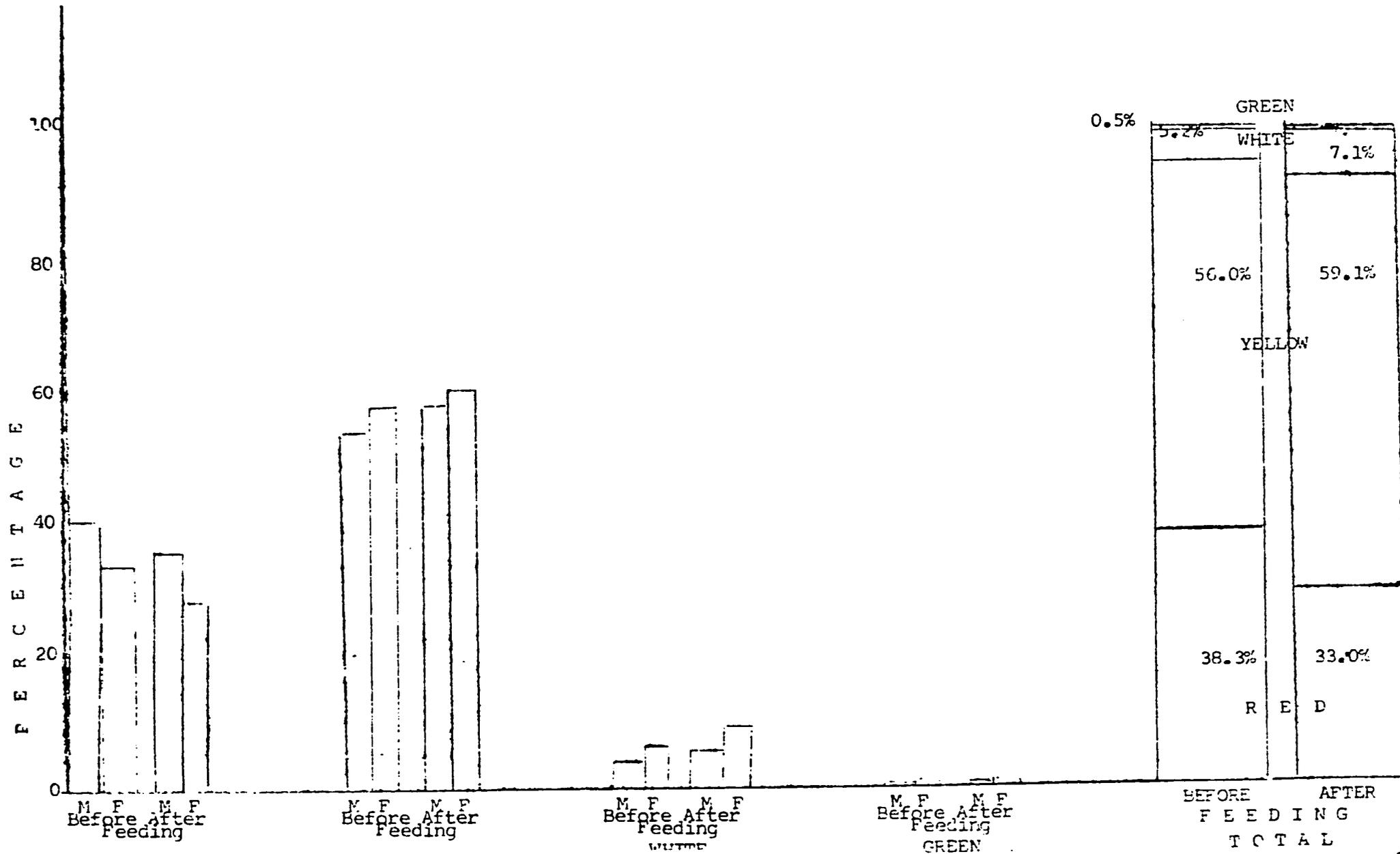
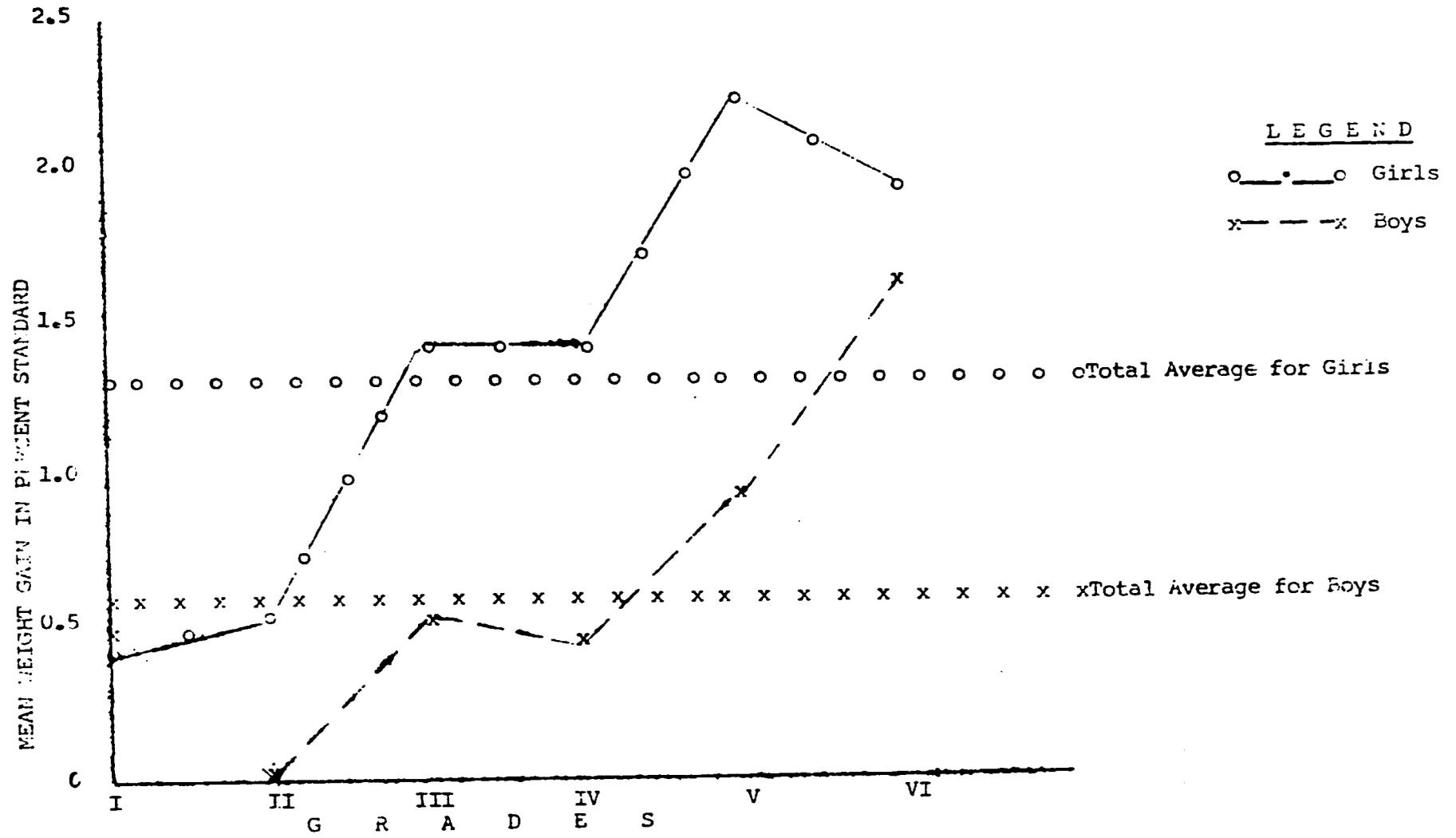
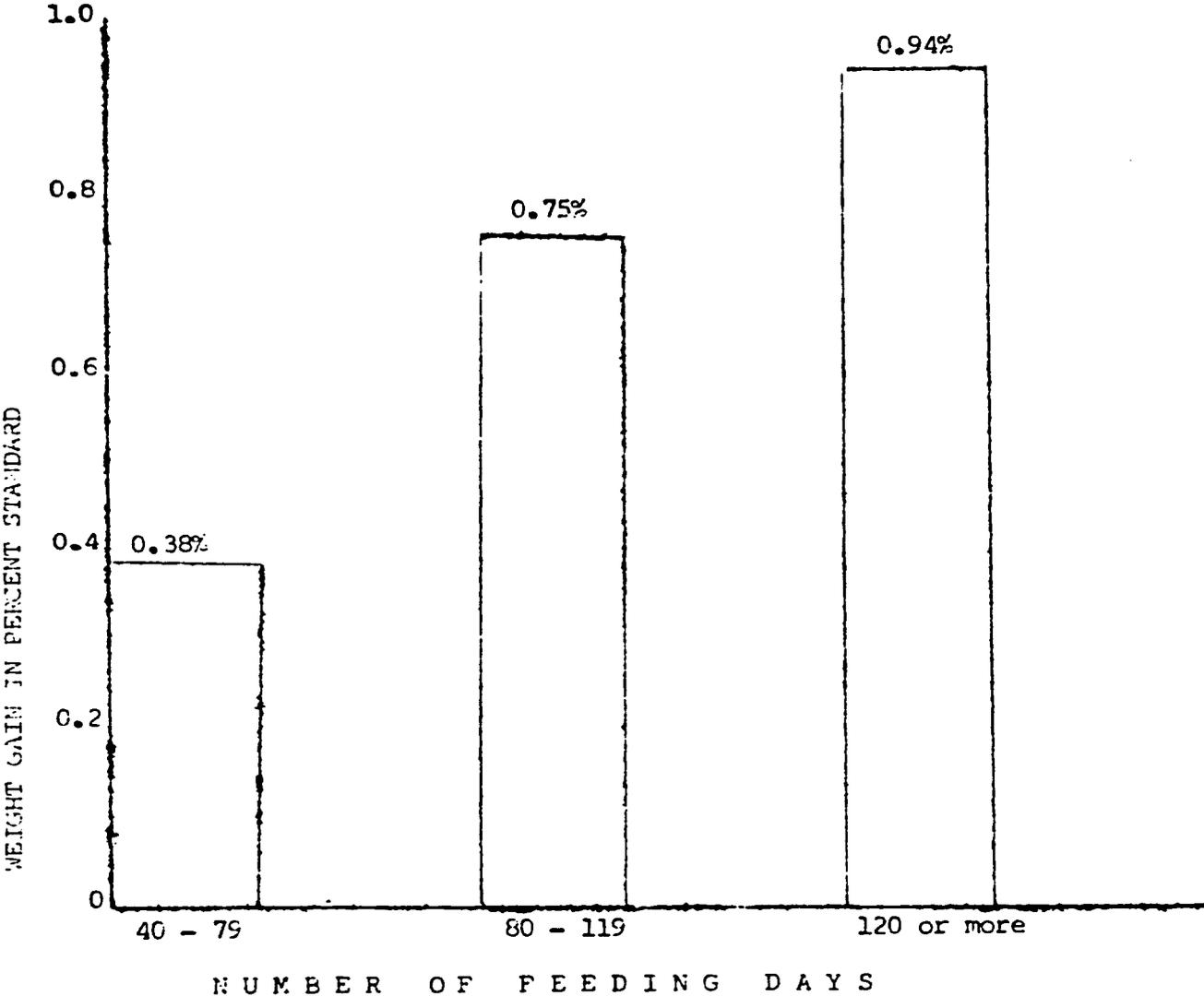


Figure B - MEAN WEIGHT GAIN IN PERCENT STANDARD BY GRADE, BY SEX



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Figure C - AVERAGE WEIGHT GAIN IN PERCENT STANDARD IN RELATION TO THE NUMBER OF FEEDING DAYS



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Pilot Evaluation Study on Reduced Nutribun
Feeding Programs

SUMMARY REPORT

Table 1 summarizes the net change in standard body weight for age of the two treatment groups with a control by grade and sex. There was only a very slight increase in the average standard body weight for age among pupils in the four control schools with no feeding. The net change was 0.16 percent with boys decreasing as average of .55 and the girls increasing to 0.86 percent respectively within the six months observation period from August 1974 to February 1975. Pupils receiving Nutribuns improved in their physical growth as measured by the standard body weight for age; the Nutribun plus Rootcrop feeding resulted in a net increase of 0.93 percent standard weight for age and the Nutribun plus Nutridle had resulted in a net increase of .83 percent. During the period of six months the feeding was given on the average of 108 days for the Nutribun/Nutridle Schools and 90 days for the Nutribun/Rootcrop Schools. The results (Table 1 & 5) have shown that root crops and nutridle can be a good substitute for up to 20% of the calories in the Nutribun.

Tables 2, 3 and 4 summarizes growth response of boys and girls in the twelve schools participating in the different Nutribun treatment groups. The results showed that girls were quite consistently performing better than did the boys in each Treatment. From these tables it could also be seen that some schools perform better than other schools in the same treatment variable. This could be a reflection of the variation in the effectiveness of nutrition efforts of the teacher.

Table 5 compares the growth response of pupils in one school receiving 500 kilo calorie Nutribun with another school receiving 300 kilo calorie Nutribun. The pupils responded equally well in the two treatments with an improvement of a little over 1% in their body weight. It has been observed that in the twelve schools included in the study, a considerable variation occurred between schools - Thus further studies are needed with at least four schools per treatment to measure accurately responses to 300 and 500 kilo calorie Nutribun. The favorable response of 176 pupils to the 300 kilo calorie Nutribun is, however, encouraging enough to proceed with the introduction of the 300 kilo calorie Nutribun with intensive Nutrition Education.

There is no consistent differences between grades among pupils of various treatment groups. The body weight improvements in all groups except the control were significant within grades and within sexes within grades as revealed by the Wilcoxon signed Rank Test. Thus it can be concluded that the different Nutribun Intervention Programs result in significant improvement in the growth and development of participating children.

Table 1: Net Change in Standard Body Weight of Grade School Children for Ages: Comparison of Two Nutribum Treatment with a Control. Four Schools in Each Treatment.

Grade	No. of Pupils	Treatments		No. of Pupils	Net Change in Percent Standard		
		400 Kilocalorie Nutribum Plus 100 Kilocalorie Nutridle and Vegetables	400 Kilocalorie Nutribum Plus 100 Kilocalorie Ractarop and Vegetables			Control-No. Feeding	
Grade I							
M	60	0.66		57	0.54	59	-0.19
F	58	0.56		58	0.36	58	+0.95
Both	118	0.61		115	0.45	117	+0.38
Grade II							
M	56	0.71		51	0.39	61	-0.89
F	60	0.95		59	1.80	53	+1.01
Both	116	0.83		110	1.15	114	-0.01
Grade III							
M	59	-0.56		60	0.52	52	-1.55
F	58	0.30		58	1.75	61	0.37
Both	117	-0.13		118	1.13	113	-0.51
Grade IV							
M	49	1.32		53	0.21	55	0.40
F	69	2.49		63	1.61	54	1.31
Both	118	2.00		116	0.96	109	.85
All Grades							
M	224	0.50		221	0.42	227	-0.55
F	245	1.14		238	1.39	226	+0.86
Both	469	0.83		459	0.92	453	0.16

**Table 2: Summary on Nutribun Plus Nutridle Schools:
Body Weight of Grade School Children as
Percent Standard for Age.**

School		No. of Pupils	Initial Weight as Percent Standard	Final Weight as Percent Standard	Net Change
Tularucan	M	55	72.46	73.17	0.71
	F	61	73.61	74.57	0.96
	Both	116	73.07	73.90	0.83
Camangahan	M	55	70.76	71.24	0.48
	F	65	71.47	72.88	1.41
	Both	120	71.14	72.13	0.99
San Antonio	M	59	75.38	76.44	1.06
	F	59	75.79	75.22	1.43
	Both	118	74.59	75.82	1.23
Tigun	M	55	74.13	73.84	-0.29
	F	60	70.50	71.23	0.73
	Both	115	72.23	72.47	0.24
All Schools	M	224	73.22	73.72	0.50
	F	245	73.32	73.40	1.14
	Both	469	72.75	73.52	0.83

Table 3: Summary on Nutrition Plus Rectored Schools:
Body Weight of Grade School Children as
Percent Standard for Age.

School		No. of Pupils	Initial Weight as Percent Standard	Final Weight as Percent Standard	Net Change
Buga	M	62	71.17	70.70	-0.47
	F	57	72.32	73.12	0.80
	Both	119	71.72	71.86	0.14
Cansilayan	M	47	71.38	73.38	2.00
	F	65	71.84	74.57	2.73
	Both	112	71.65	74.07	2.42
Jovellar	M	64	69.98	70.31	0.33
	F	55	69.15	69.74	0.59
	Both	119	69.60	70.13	0.53
Quinaras	M	48	70.73	70.92	0.14
	F	61	67.94	69.16	1.22
	Both	109	69.17	69.93	0.74
All Schools	M	221	70.79	71.20	0.41
	F	238	70.33	71.76	1.43
	Both	459	70.55	71.49	0.94

Table 4: Summary on Control Schools: Body Weight of Grade School Children as Percent Standard for Age.

School		No. of Pupils	Initial Weight as Percent Standard	Final Weight as Percent Standard	Net Change
Duntatala	M	55	71.53	71.96	0.43
	F	59	70.39	71.37	0.98
	Both	114	70.94	71.66	0.72
Tabucan	M	58	64.64	64.53	-0.11
	F	62	64.31	64.51	0.20
	Both	120	64.47	64.52	0.05
Balabago	M	56	69.47	67.53	-0.94
	F	56	69.73	71.17	1.44
	Both	112	69.60	69.35	-0.25
Boco	M	58	70.14	69.57	-0.57
	F	49	71.04	71.95	0.91
	Both	107	70.56	70.67	0.12
All Schools	M	227	68.90	68.35	-0.55
	F	226	68.71	69.57	0.86
	Both	453	68.80	68.96	0.16

**Table 5: Net Change in Standard Body Weight of
Grade School Children for Age:
Comparison of two Nutribun Treatment
with a Control*
One School in Each Treatment.**

Treatments						
500 Kilocalorie Nutribun			300 Kilocalorie Nutribun		Control † No Feeding	
Grade	No. of Pupils	Net Change in Percent Standard Weight	No. of Pupils	Net Change in Percent Standard Weight	No. of Pupils	Net Change in Percent Standard Weight
Grade I						
M	31	0.96	22	1.57	59	-0.19
F	30	-0.03	18	0.61	58	0.95
Both	61	0.47	40	1.41	117	0.38
Grade II						
M	24	0.81	23	-0.20	61	-0.89
F	37	1.72	24	0.77	53	1.01
Both	61	1.36	47	0.29	114	-0.01
Grade III						
M	26	1.20	18	2.98	52	-0.55
F	27	1.27	25	1.62	61	0.37
Both	53	1.23	43	2.19	113	-0.51
Grade IV						
M	30	1.12	31	0.99	55	0.40
F	24	1.15	15	2.53	54	1.31
Both	54	1.13	46	1.03	109	0.85
All Grades						
M	111	1.03	94	1.00	227	-0.55
F	118	1.07	82	1.32	226	0.86
Both	229	1.05	176	1.15	453	0.16

* Control (Four Schools)

OVERALL PNP ACCOMPLISHMENTS

The overall effectiveness of the PNP can be ascertained from the degree by which the Program has attained specific objectives for Program year 1976-1977.

Improvement of the Nutritional Status of Pre-School Children

The overall target for pre-schoolers is to reduce by 7% the prevalence of third and second degree malnutrition among the group, and increase by 8% the proportion of pre-schoolers with normal weights.

Based on the latest available information from NNC on the nationwide initial and re-weighing results of Operation Timbang (OPT), the proportion of second and third degree malnourished pre-school children to total pre-school children weighed has increased by 2.0 percentage points. The proportion of children of normal nutritional status has also increased but only by a mere 0.2 percentage points. Although the re-weighing figures show that there has been a deterioration of nutritional status among pre-schoolers, these may not be conclusive since re-weighing results represent only 1.5 million children out of a total 4.4 million subjected to initial weighing.

Data from an NNC exploratory study of nutritional status changes from 1975 to 1977 for seventeen provinces indicated a general improvement in nutritional status. The proportion of third degree malnourished children decreased by 8.6% while the proportion of normal pre-schoolers increased by 4.7% from the initial weighing to the re-weighing. The proportion of first degree malnourished children likewise decreased by 3.6% with the proportion of second degree malnutrition increasing by 4.6%.

These findings are supported by the 1978 SGV survey which included an independent test of the progress in nutritional status of second and third degree malnourished children. On the spot weighings of selected OPT participants and comparisons of actual weighings results with latest available OPT records of said participants were undertaken. Survey findings indicated favorable results with 59% of second and third degree pre-schoolers weighed showing improvement in nutritional status. An almost equal number (48%) maintained

their nutritional status, while 3% deteriorated from second to third degree status.

In families where weighings of second and third degree OPT participants were made, a significant proportion of normal children weighed of the same families showed a downward movement in nutritional status. This indicates that the presence of a malnourished child which has priority in feeding is detrimental to other children, especially when the available food is not sufficient to meet the requirements of the entire family.

Improvement of the Nutritional Status of School Children

Similarly, NNC has quantified its targets for school children as follows: to reduce by 20% the prevalence of third and second degree malnourishment of this group and increase by 10% the proportion of school children of normal weights.

Since primary data was not available at the time of the survey on the nutritional status of school children, secondary data from the Ministry of Education and Culture, as well as 1978 survey findings of school-related nutrition activities, were used for the evaluation. Following are the findings:

1. The promotion of nutrition knowledge has been integrated in school curricula at all levels.
2. For the school 1977 - 1978, school children were provided with basic health services, with emphasis on immunization and deworming.
3. Supplementary feeding of school children were undertaken with the support of USAID and US voluntary agencies. Mothers of recipient children in the 1978 survey also indicated visible changes in the children's nutritional status.

Identification and Treatment of Target Groups with Nutrient Deficiencies

Again, the evaluation is hampered by the lack of a system to monitor accomplishment under this objective. This is validated

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by the absence of implementor records on nutrient deficiencies even at the local level. The only indication that can be gathered on the extent of implementation of this objective is the finding that only 5% out of 1,500 respondents of the 1978 survey were aware of the nutrient deficiency identification drive. Of these informed respondents, 70 cases were identified and treated for such deficiencies.

Strategic PNP Accomplishments

The accomplishments of individual PNP strategies, as well as a comparison of performance in terms of recipient involvement and substantive results at the national and regional levels, are discussed in the following section.

Operation Timbang

Operation Timbang (OPT) conducts weight surveys of infants and pre-schoolers from the ages of 0-6 years of age. The specific objectives of OPT are: to locate families with malnourished children, identify children needing immediate assistance, and determine priority areas for program implementation. The results of OPT serve as a basis for planning and implementing the nutrition program in the barangay.

Of an estimated total of 10.8 million pre-schoolers in the Philippines, OPT has covered only 4.4 million or approximately 41% of the targeted population as of December 1977. No comparisons with historical data can be made since OPT was only instituted in 1976.

The limited accomplishment in both initial weighing and re-weighing is due to the insufficiency of weighing scales (only one-third of the budgeted number of scales was distributed due to lack of funds); slow pace of organization of Barangay Nutrition Committees (BNC), the primary group responsible for the conduct of weighings; and delays in reporting and some inaccuracies found in OPT data.

Operation Timbang is coordinated throughout the country by the Ministry of Health (MOH) which draws from the various participating agencies and nutrition committees, especially the BNCs. Feedback from OPT participants support the major role of MOH in OPT-related activities. Rural Health Units of MOH, followed by Ministry of Education and Culture (MEC) and Ministry of Social Services and Development (MSSD) were cited by respondents as the organizations that conducted the weight surveys.

11.1.1.1

In addition to the actual conduct of weighing, implementors claimed to undertake post -OPT activities (e. g. referrals of third degree cases to rehabilitation centers and extension of Food Assistance). This claim, however, was not corroborated by governors and mayors who reported low admission rates in rehabilitation centers, and OPT respondents' claim that only few referrals were made. Most respondents were neither informed of the nutritional status of their children after weighing. The omission of this communication process reduces the overall effectiveness of OPT, specifically in instilling among respondents the practice of weighing as a follow up measure to determine the nutritional status of children.

A greater number of implementors also failed to appreciate OPT as a planning tool, an important component in determining the proper mix of nutrition strategies to be applied to priority groups.

Most respondents were knowledgeable on the OPT objectives and the nutritional status of their children who were weighed. This is also a function of OPT's visibility at the barangay level. In terms of practice and attitude towards OPT, however, a high proportion of the children surveyed were weighed only once against the desired frequency of twice a year. Reasons cited for submitting children to weighing were usually to take advantage of handouts, i. e., food, medicine and vitamins, which usually follow a weight survey.

Food Production

This strategy had the highest level of involvement, both in terms of number of respondents undertaking gardening and animal raising activities, and length of involvement (i. e., two years or more). It was also consistently the most practiced activity for the period covered by both 1975 and 1978 evaluations.

Gardening was the most popular activity undertaken at the home, community, and school levels. Animal raising was not as extensively practiced as in 1975. Home garden produce was primarily channeled for home consumption, although to some extent, family incomes were augmented from sale of produce. Reliance on their own sources of seeds and breeds, rather than dependence on agency provisions, was also observed. Community gardening activities were minimal: as such, its role as an important source of inputs for the Food Assistance program was not met.

The Green Revolution campaign, as well as implementor activities such as the establishment of seed banks, supervision of school planting activities and the conduct of demonstrations and lectures, were undertaken primarily by the Department of Agriculture through Bureau of Agricultural Extension (BAEX) and the MEC. It should be noted that provisions of seeds and breeds are not extensively undertaken, resulting in recipients resorting to their own sources of inputs.

The degree of success which has been achieved among the general recipients is reflected in their practice of, and attitude towards, the planting of food crops and raising of animals. As a whole, it has been observed that respondents are planting the right kind of food crops in their gardens, i. e., those with high nutritive value. Survey findings reveal proper attitudes among respondents with the majority engaging in food production activities for home consumption and food self-sufficiency, and for the nutritive value which can be derived from food.

In contrast to the general recipients, the involvement of students in food production activities was as a low level. Students also reflected poor attitudes towards their participation in gardening and livestock raising projects, with a majority stating that their reason for participating in the activity was because it was a school requirement and not because of the nutritive value of the food grown and its importance in their daily diet. In terms of knowledge of the nutritive value of crops, however, exceptionally high results were obtained by students. This gap between knowledge and practice is an area that should be improved for the effectivity of the Program.

Food Assistance

Food assistance, as a nutrition strategy, has short term and long term objectives. As an emergency measure, FA aims to improve the nutritional status of malnourished children by providing them with food that will raise the children's weights to at least 50% of their starting weights. As a long term objective, FA aim to provide parents of malnourished children with training experience on proper feeding habits for practice in homes.

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In 1978, FA showed the lowest recipient involvement level of all the strategies at 18%, with only 275 out of 1,500 general recipients as participants of the various feeding programs. Nevertheless, 1978 involvement in FA is slightly higher than that of 1975.

Of the type of feedings, home based feeding was most prevalent and effective, based on high completion rates of feeding programs and improvements in nutritional status as observed by others (i. e., improved weight, stronger body, healthier disposition and better appetite). Shortages in food supply, primarily foreign donated commodities, resulted in program suspension in selected areas. For community center feeding, which derives its food sources from locally grown/manufactured commodities, non-completion of feeding programs was primarily due to the inaccessibility of centers to respondents.

School feeding showed the highest program completion rates, because all grade school children are required to participate; this, however, was not effectively translated into improvement of nutritional status.

Beyond the emergency objectives of FA, supplementary feeding in homes was not satisfactory with mothers showing poor recall of subject areas taught in feeding centers, and lack of adequate preparation of correct diets for children.

As expected, FA participating agencies are Catholic Relief Services (CRS), MOH at the home level; MSSD, MOH and BAEX at the community level; and MEC in schools. Most were occupied in feeding activities, to the detriment of other functions such as nutripak processing (a source of supplementary food assistance), providing logistics support, and encouraging local supply of foods. In a separate finding, governors and mayors also indicated a low level of establishment of nutripak processing plants, primarily because of availability of fresh food materials, presence of agency handouts, and administrative problems.

While recipients were knowledgeable about FA objectives, and food distributed in centers, and completed feeding programs, their general attitude towards feeding was to avail of handouts. Food Assistance participants failed to see the temporary nature of emergency aid and the ultimate objective of self-reliance was not

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attained for this strategy.

Nutrition Information and Education (NIE)

Of all strategies, NIE has shown the highest degree of improvement in terms of involvement in various NIE activities, as well as effectiveness in reaching the target audience for the period covered by the 1975 and 1978 evaluations. The primary communication network is the school, followed by community classes/club meetings, and home visits. Broadcast media (specifically print and radio) played a significant role in the delivery of priority messages.

General recipients were consistently aware of priority messages on family diet and family planning, a function of the degree of exposure of these messages. Related to substantive results obtained, this group also showed a high degree of awareness, attitude, and practice of diet related nutrition concepts, i. e., functions and nutritive value of food groups, food substitutability and food selection and preparation. On the other hand, family planning awareness was not translated into practice, as exhibited by low acceptance rates of respondents.

Pregnant and lactating mothers' performance for this strategy was the most outstanding primarily due to correct observation of infant feeding practices as prescribed by the PNP.

Health Protection

Recipient involvement in health protection activities was low according to the 1978 evaluation, with little more than half of general recipients involved primarily in immunization and deworming. An even lower involvement level was registered for health and sanitation in 1975, indicating some progress for this strategy.

The poor performance was due to lack of interest and information on the value of these campaigns on the part of recipients, and the lack of efforts of implementors. Based on governor and mayor responses, there was a total absence or inadequacy of rehabilitation centers in their localities where malnourished cases can be referred. Though third degree children released from malwards showed definite improvement, follow-ups of discharged cases were usually not made.

The performance of other activities related to Vitamin A and other nutrient deficiencies is a result of a lack of uniform standard for identification. Practice levels of NIE respondents for environmental sanitation as well as volunteer mothers undertaking home visits related to this activity, indicate that recipients may simply not recognize environmental sanitation as part of health protection.

Substantive results obtained were the lowest for all strategies as a result of low recipient involvement, lack of awareness of objectives of various activities, and poor attitude of recipients.

Family Planning

While this activity has recently been de-emphasized as part of the total package of PNP strategies since a more directed effort is undertaken by the Population Commission, the present practice of family planning among survey respondents has remained at the same level as that of 1975. The low acceptance rate was due to fear of side effects of contraceptive devices and methods, and desire to have more children.

Recipients were generally aware of family planning objectives, with the Rural Health Unit doctors followed by word-of-mouth as the principal sources of awareness. (This finding is supported by the high recall of family planning messages in NIE). Attitude and practice levels, however, based on reasons for present level of acceptance, indicates a definite need to re-evaluate the significance of this strategy in the PNP, since a larger family size affects the total food resources available, especially for families with 3rd and 2nd degree cases of malnourishment.

National Results

Table 1 shows a summary of recipient involvement and substantive results by PNP strategy. The following are the highlights:

Food Production showed the highest recipient involvement level among all strategies indicating widespread participation in gardening and animal raising. Provision of health services was also given considerable attention while the strategy least participated in was Food Assistance, particularly school feeding.

Table 1. Summary Indicators of Substantive Results
 PNP Strategies
 Recipient Involvement and Composite Scores

Strategy	Respondents Base	Recipient Involvement	Overall			Knowledge			Attitude			Practice		
			Maximum Points	Median Score	%	Maximum Points	Median Score	%	Maximum Points	Median Score	%	Maximum Points	Median Score	%
Operation Timbang	647	41.0% ¹	100	37	37	20	12	60	30	5	14	50	20	40
Food Production		75.3												
General recipients	1,128		100	62	62	n.a.	n.a.	n.a.	30	23	77	70	30	50
Students	388		100	42	42	20	17	85	20	5	25	60	20	33
Food Assistance		18.0												
Community center feeding	85	30.9	100 ²	56	56	20	12	60	25	9	36	50	30	60
Home based feeding	122	44.4	100 ²	56	56	20	9	45	25	9	36	50	33	66
School feeding		24.7												
Health Protection	1,500	59.1	100	21	21	40	7	18	N.A.	N.A.	N.A.	60	14	23
Nutrition Information and Education		53.1												
General recipients	1,500		100 ²	60	66	30	21	70	15	9	60	50	36	72
Pregnant/lactating mothers	743		100	71	71	n.a.	n.a.	n.a.	30	21	70	70	50	71

NOTES:

¹ Based on NNC figures of 4.4 million preschoolers reweighed.

² Includes additional 5 points for community involvement.

³ Family Planning results were not scored.

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Overall national scores indicate that Nutrition Information and Education has significantly influenced the most number of respondents followed by Food Production (specifically those related to activities of general recipients) and Food Assistance. The ratings for Nutrition Information and Education and Food Production are attributable to the consistently high scores obtained for knowledge, attitude and practice aspects. Food Assistance, on the other hand, obtained average scores for knowledge and practice but had a low score for attitude. Operation Timbang registered a low overall score due to a poor score for attitude and a below average score for practice. Health Protection had the lowest overall score brought about by the very low knowledge and practice scores obtained.

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VEGETABLE SEED PRODUCTION IN PHILIPPINE VOCATIONAL
AGRICULTURAL SCHOOLS -- ITS POTENTIAL CONTRIBUTION
TO COUNTRYSIDE DEVELOPMENT

Reuben C. Delgado and John A. Dwyer*

Today in the developing countries of the world poverty is widespread, especially in the rural areas. A recent World Bank report estimates that about 415 million people or an estimated 40 per cent of the total population representing the developing market economies of Asia lived in conditions of absolute poverty in 1969 and about 355 million (85 per cent) of these were found in rural areas. ^{1/} In the Philippines, as well as in other developing countries, the provision of adequate food for the rural and urban poor has been a major concern of governments and international agencies concerned with their welfare.

The theme of the 13th Annual Meeting of the Society for the Advancement of the Vegetable Industry (Philippines), the "Agribusiness Approach to Countryside Development" is both timely and appropriate since it reflects the concerns of the national government which call for a "countryside" or integrated rural development program aimed at the rural poor. Such a program would involve two basic strategies, namely, to increase the productivity of the rural poor and to ensure the participation of the rural poor in planning and executing development programs which provide them with basic social services.

In this paper, we attempt to show how vegetable seed production activities in vocational agricultural schools and colleges in the Philippines represent an often overlooked resource available to the Philippine vegetable seed industry which potentially could make a significant contribution to countryside development. The paper has three parts: the first section discusses the current status of vegetable seed production activities in selected vocational agricultural schools and colleges and the changes that have occurred in production from 1974-1978; the second section examines the potential contribution of vegetable seed production activities in these institutions to

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1/ The Assault on World Poverty, World Bank (1975).

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countryside development program; the third section discusses the prospects for future expansion of vegetable seed production activities in selected vocational agricultural schools and colleges with particular emphasis on developing a more effective interface between on-going food and nutrition programs in the country.

Current Seed Production Activities in Selected Vocational Agricultural Schools and Colleges ^{2/}

In 1972 as an aftermath of the worst floods in Philippine history, the national government embarked upon a crash program of vegetable seed production in selected vocational agricultural schools and colleges to provide planting materials to meet the acute food shortages brought about by the disaster. The Government of the Philippines (GOP) was able to receive from various foreign governments, especially Taiwan, large quantities of assorted vegetable seeds as part of their immediate response to the country's call for relief assistance. These were distributed to the rural areas through an intensified Green Revolution home food production campaign. Realizing that these assistance type activities were only stop gap measures since the Philippines is annually visited by an average of 28 typhoons accompanied by the occurrence of flooding with often extensive damage to agricultural crops, the national government through the Green Revolution Executive Committee (GREC) initiated discussions centering upon the possibility of producing vegetable seeds and planting materials to at least meet the emergency needs of the rural populace during times of disaster as well as to make adequate supplies of reliable planting materials available to support the Philippine Nutrition Program school and targeted feeding program activities for malnourished children.

The genesis of vegetable production activities in selected vocational agricultural schools and colleges is traced to meetings held in 1972 with representatives of the Green Revolution Executive Committee (GREC), the Ministry of Education and Culture (MEC), the University of the Philippines, Los Baños (UPLB), the National Food and Agriculture Council (NFAC), the Bureau of Plant Industry

2/ The data in this section draws upon reports and materials prepared by field representatives of the Green Revolution Executive Committee (GREC), the Ministry of Education and Culture (MEC), C. A. R. E. and USAID and representative seed production coordinators.

(BPI), C. A. R. E. and USAID. Action Plans were formulated and a Project Agreement was executed with the MEC designating 35 to 40 vocational agricultural schools and colleges under the Ministry to establish local vegetable seed production and distribution facilities. A coordinating Subcommittee was established under the Green Revolution National Executive Committee to direct the program composed of the Deputy Minister of the MEC as Chairman and the Chairman of the Green Revolution Executive Committee as Co-Chairman. Representatives of UPLB, NFAC, BPI, the National Nutrition Council (NNC), C. A. R. E. and USAID were included for membership in the committee. As a proper start for the project, the designated teachers-in-charge of the seed production activities at each selected school were trained for a 4 week period at UPLB in seed production technology and extension in late 1973. In addition, project support funds were made available to the participating centers based upon their needs and potential for implementing a viable seed production program.

Through the efforts and financial assistance of MEC, GR, CARE, NFAC, UPLB, BPI, NEDA and USAID progress has been made in vegetable seed production at selected vocational agricultural schools and colleges. Table 1 presents a regional listing of seed production centers at selected Philippine vocational agricultural schools and colleges who have engaged in small scale seed production activities to varying degrees. In the period 1974-1978 financial assistance amounting to approximately P415,000 was provided by the MEC, CARE, GREC, NFAC, USAID/NEDA to selected schools to produce targeted vegetable seeds and planting materials to backstop on-going school/home gardening activities. An estimated P300,000 was utilized to purchase foundation seed stock and for seed farm development with the balance of about P115,000 used to purchase needed equipment and accessories. Even at these relatively low levels of financial assistance (about P3,500 per school per year) the seed production activities continued to appear promising. During the 1975-1976 period, the total vegetable seed production output reached a level of 94,000 kilos of assorted vegetable seeds and planting materials. Some seed production centers performed better than others, but in general the interest and enthusiasm of the seed production coordinators remained high.

The data in Table 2 give some insight into the types and value of vegetable seed production from selected vocational agricultural

schools and colleges in 1977. Total production of vegetable seeds declined as the schools embarked upon a more selective approach by producing targeted National Nutrition Council (NNC) recommended vegetable seeds and planting materials (see Table 3) to support Philippine Nutrition Program home and school gardening activities. In addition, the decision was made to employ a more agribusiness type approach to the seed production activity whereby each participating school would target production goals according to the seed/planting materials requirement submitted to each center by schools, barangays and private groups in the respective surrounding service areas. Seeds produced were to be sold at a fair price to the service area home and school gardeners, while the production of selected cash crops was also encouraged at the schools to provide them with an additional source of operating capital to insure that project activities become self-sustaining in nature.

The latest report of seed production activities at selected schools/colleges is still encouraging. Table 4 shows the current levels of seed production as of August 1978. The types of seeds and planting materials being produced have been reduced as more schools have chosen to specialize in only those crops required to meet the needs of their service areas (i. e. barangays, schools and farm groups). In addition, it should be noted that the seed and planting materials requirements of the service areas surrounding the seed production centers should decline over time as school garden teachers, farmers and private sector producers save seed and cuttings from previous crops to meet their future planting requirements.

Overall the data presented indicate that seed production activities in selected vocational agricultural schools have made a contribution to countryside development programs, especially in providing support to school and home gardening activities of the Philippine Nutrition Program. The continued identification of the vocational agricultural schools and colleges as the focal point for evolving an integrated vegetable seed production thrust to support agricultural and rural development activities should be encouraged.

Institutional Based Seed Production Activities and Their Role in Countryside Development

The two basic strategies identified to assist in "countryside" development relate directly to the current and potential role that seed production activities in selected vocational agricultural



schools and colleges play in providing basic social services to the rural populace. In particular, it is hypothesized that an expanded vegetable seed production capability located in school agricultural institutions in the Philippines, if properly supported by financial and technical resources, can make a major contribution to the provision of adequate food to the rural and urban poor through the provision of good quality targeted vegetable seeds and planting materials on a regular basis to support on-going regional, provincial city/municipal and barangay school and home gardening activities.

Three important functions can be envisioned for the institutional based seed production activities, namely: (1) the selected seed production centers can serve as a source of regional and local level technical expertise in vegetable seed production; (2) the institutions can serve as training centers for upgrading the seed and food production capabilities of central and elementary school garden teachers; and (3) the seed production activities can also provide non-formal educational inputs to local farm groups in targeted food production activities.

The success or failure of the "countryside" development approach will rely upon how well the rural sector, (i. e. the vocational agricultural schools and colleges) can respond to the needs of its populace. The existing national program of seed production, processing and distribution is largely focused upon major food crops (i. e. rice, corn, soybeans). This is intended to strengthen existing weaknesses in national food production programs, expand these systems and also improve the linkage between the vegetable producer and the consumer through intensified promotional efforts to achieve a more adequate food intake through a more diversified diet. The challenge still remains, however and an expanded vegetable seed production capability in selected vocational agricultural schools and colleges can provide a major input to the development of an integrated seed-vegetable production industry and a nutrition-education program targeted to meet the food needs of the rural poor.

Future Prospects: A More Effective Interface Between Food and Nutrition Programs

The tasks facing the vegetable seed production industry in the Philippines are indeed formidable. These challenges relate to the capacity of domestic agriculture to provide adequate food supplies

relative to both consumption needs and demands. The vegetable seed production activities of selected vocational agricultural schools and colleges represent only a single phase in the countryside development efforts of the national government.

It is proposed that an institutional based vegetable seed production strategy may be a logical starting point for a longer range development plan of establishing a commercially viable private seed production industry. Little is actually known about the vegetable seed requirements of the rural farmers and home gardeners with the exception of the targeted seed requirements for cereals and selected cash crops. This fact alone discourages the private sector from becoming heavily involved in large scale vegetable seed production. Yet, the need still exists for the provision of dependable vegetable seeds and planting materials to backstop government food production activities being encouraged as part of the Philippine Nutrition Program (PNP).

The role of the vegetable seed production program in selected vocational agricultural schools and colleges is therefore that of providing for a more effective interface between food and nutrition programs. An upgraded and expanded vegetable seed production program based in rural agricultural schools will assure a reliable supply of seeds and planting materials to rural households and school food production activities. But the final solution to the problem of effective "countryside" development will ultimately lie with the farmer and the private sector. The farmer decides whether he will plant another crop or grow an improved variety. The private sector, for example, the vegetable seed producers will respond to his needs by providing for his planting requirements. It is also the farmer who decides what part of the new technology to use on his farm. The ability of the vegetable seed production industry to meet the needs of the agricultural sector will ultimately determine how well-fed people will be and to what extent the demand for food in the future is met. The challenge is yours.

Table 1. Regional Listing of Philippine Seed Production Centers
at Selected Vocational Agricultural Schools and Colleges

Name of School	Location
<u>Region I</u>	
1. Ilocos Sur Agricultural College	Sta. Maria, Ilocos Sur
2. Dingras National Agricultural School	Dingras, Ilocos Norte
3. Don Mariano Marcos Memorial College of Agriculture	Bacnotan, La Union
<u>Region II</u>	
4. Cagayan Valley Agricultural College	Lal-lo, Cagayan
5. Jones Rural High School	Jones, Isabela
6. Ifugao Agricultural & Technical College	Lamut, Ifugao
<u>Region III</u>	
7. Philippine National Agricultural School	Sta. Maria, Bulacan
8. Pampanga Agricultural College	Magalang, Pampanga
9. Bataan National Agricultural School	Abucay, Bataan
<u>Region IV</u>	
10. Baybay National College of Agriculture & Technology	Siniloan, Laguna
11. Quezon National Agricultural School	Pagbilao, Quezon
<u>Region V</u>	
12. Bicol University College of Agriculture	Guinobatan, Albay

Table 1. (Continued)

Name of School	Location
13. Catanduanes State College	Virac, Catanduanes
14. Camarines Sur National Agricultural School	Pili, Camarines Sur
<u>Region VI</u>	
15. Aklan Agricultural College	Banga, Aklan
16. Antique College of Agriculture	Hamtic, Antique
17. Dingle Agricultural & Industrial School	Dingle, Iloilo
18. Leon National College of Agriculture	Leon, Iloilo
19. Mambusao Agricultural & Technical College	Mambusao, Capiz
20. Cebu Southern Agro- Industrial School	Argao, Cebu
<u>Region VII</u>	
21. Bohol Agricultural College	Bilar, Bohol
<u>Region VIII</u>	
22. Biliran National Agricultural School	Biliran, Leyte
23. Alang-Alang Agro-Industrial School	Alang-Alang, Leyte
<u>Region IX</u>	
24. Sindangan National Agricultural School	Sindangan, Zamboanga del Norte
<u>Region X</u>	
25. Claveria National Rural High School	Claveria, Misamis Oriental

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Table 1. (Continued)

Name of School	Location
<u>Region XI</u>	
26. Davao City Seed Bank	Davao City
27. Davao Sur Seed Production Center	Digos, Davao del Sur
<u>Region XII</u>	
28. Mindanao Institute of Technology	Kabacan, Cotabato

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Table 2. Vegetable Seed Production of Selected Vocational Agricultural Schools and Colleges in 1977

Kinds of Vegetables	For Seed		For Food	
	Kilos	₱Value	Kilos	₱Value
1. Bush Sitao	2,820	₱ 26,318	800	₱ 3,574
2. Mekan Pea	3,602	30,101	209	1,040
3. Mungo	3,991	32,792	327	1,747
4. Corn ^{1/}	2,236	9,626	4,770	8,000
5. Sweet Potato (cuttings)	12,700	850	1,958	2,398
6. Cassava (cuttings)	9,300	490	1,500	225
7. Malunggay (seedlings)	1,528	500	200	400
8. Other vegetables ^{2/}	1,223	8,280	2,789	11,400
9. Pechay	5	250	1,870	2,345
10. Papaya (seedlings)	4,724	236	1,682	2,040
11. Breadfruit (seedlings)	60	240	90	180
Totals	13,877 (seed) 22,000 (cuttings) 6,312 (seedlings)	₱109,683	16,195	₱33,409
Total Production		30,072 Kilos		
Total Value		₱143,092		

Note: The figures above were computed from summary reports of 21 vocational agricultural schools/colleges.

1/ Sweet and glutinous combined

2/ Includes: peanut, squash, ampalaya, soybeans, tomato

Table 3. NNC Recommended Crops For Backyard Food Production*

Crops	Scientific Name
A. Roots & Tubers	
1. Sweet Potato	<u>ipomoea batatas</u> (L.) Poir
2. Cassava	<u>Manihot utilissima</u> L.
3. Gabi	<u>Colocasia esculenta</u> (L.) Schott
4. Ubi	<u>Dioscorea alata</u> L.
B. Legumes	
5. Cowpea	<u>Vigna sinensis</u> (Stickm.) Savi ex Hass
6. Mungo	<u>Phaseolus aureus</u> Roxb.
7. Peanut	<u>Arachis hypogea</u> L.
8. Batao	<u>Dolichos lablab</u> L.
9. Patani	<u>Phaseollus lunatus</u> L.
10. Pigeon Pea	<u>Cajanus cajan</u> Millsp.
11. Tapilan	<u>Phaseolus Calcaratus</u> Roxb.
12. Singkamas (pods)	<u>Pachyrrhizus erosus</u> (L.) Urban
13. Winged bean	<u>Psosphocarpus tetragonolobus</u> (L.) DC
C. Leafy	
14. Malunggay	<u>Moringa oleifera</u> Lam
15. Kangkong	<u>Ipomoea aquatica</u> Forsk
16. Alugbati	<u>Basella rubra</u> L.
17. Saluyot	<u>Corchorus olitorius</u> L.
18. Amaranth	<u>Amaranthus viridis</u> L.
19. Hot Pepper	<u>Capsicum frutescens</u> L.
20. Chayote	<u>Sechium edule</u> (Jacq.) Sw
21. Ampalaya	<u>Momordica charantia</u> L.
22. Squash	<u>Cucurbita maxima</u> Duch.
D. Fruits	
21a. Ampalaya	
22a. Squash	
23. Okra	<u>Abelmoschus esculentus</u> (L.) Moench.

*After consultation with PCARR, NFAC, UPLB & BPI researchers.

Table 4. Vegetable Seed Production Report from Selected Vocational Agricultural Schools and Colleges, January-June, 1978

BREAKDOWN OF SEED PRODUCTION

Kind of Vegetables	For Seed		For Food		TOTAL	
	Kilos	₱Value	Kilos	₱Value	Kilos	₱Value
1. Bush Sitao	964	₱ 8,813	347	₱ 3,239	1,311	₱12,052
2. Mekan Pea	830	7,212	99	641	929	7,853
3. Mungo	1,962	8,622	372	3,055	2,334	11,677
4. Corn ^{1/}	759	2,484	1,390	3,502	2,149	5,986
5. Others ^{2/}	1,809	18,182	13,060	17,646	14,869	35,828
6. Cuttings and Seedlings ^{3/}					33,603	1,688
TOTAL	8,424	₱66,313	15,268	₱28,083	23,692	₱75,084

1/ Sweet and glutinous corn combined

2/ Nutritious vegetables: cassava, gabi, peanuts, patani, others.

3/ Cassava and sweet potato cuttings, papaya and malunggay seedlings.