

A Multi-Approach
Intervention
TO EMPOWER
**POSYANDU
NUTRITION**
PROGRAMS
To Combat
Malnutrition Problems
In Rural Areas

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Summary

Posyandu is a community-based health effort which is from the community, managed and held by the community, and intended for the community in carrying out the health development to empower the community and to provide them an easy access to obtaining basic health/social services in order to accelerate the decrease of the maternal mortality rate and the infant mortality rate.

Home garden is an area around the house where spices, herbal plants, vegetables, and fruits can grow in season or along the year in order to meet household needs. Home garden utilization is a home garden which is managed through an integrated approach so it is expected to be able to guarantee the availability of various food materials continuously in order to fulfill the household nutrition.

The objectives of the study were: (1) to identify factors affecting community participation in the *Posyandu* program, (2) to identify land ownership and plant/animal diversity of rural community, (3) to identify knowledge, attitude and practise of nutrition among mothers and *Posyandu*'s cadres, (4) to revitalize *Posyandu*'s activities through mothers nutrition education, cadres training, and facilitating *Posyandu* equipment, (5) to improve community participation in the *Posyandu* program, and (6) to empower community through home gardening for income generating and food availability.

The research was conducted by giving an intervention in a form of nutritional extension and home gardening for the households who had children under five and were active as *Posyandu* members. As many as 93 households having children under five were given the intervention in this research, and 31 households having children under five were not given any intervention; this functions as a control. The research was conducted in Sub District of Tamansari, Bogor District, West Java, Indonesia. This research was conducted from January 2012 to December 2013.

This research was started by collecting baseline data of 124 households of mothers of children under five and 18 cadres of *Posyandu* selected before the intervention was done. The baseline data was used to get a preliminary information on the socio-economic characteristics of the households, the condition of home environment, land ownership, nutrition knowledge, attitude to nutrition and nutrition practice of the mothers of children under five, as well as food consumption of the children under five.

The intervention implementation included two main activities, that is, nutrition education and a home-gardening program. Prior to the implementation of this program, the research team socialized the program and conducted a focus group discussion (FGD) to three villages getting the intervention. The socialization included presentation of the purposes and goals of the program in general, the schedule, and the forms of activities that will be performed. The socialization was not only directed to the mothers of children under five and cadres being the research respondents but also to the midwives, leaders of the villages, heads of RTs/RWs (subparts of a village) and the local government (Sub-District of Tamansari). The objectives of the socialization was to describe the programs to be conducted within two years so that the stakeholders were able to support the program accomplishment.

The data analyses of the baseline and endline included parameter estimation, that is, mean, standard deviation, for the quantitative variables as well as the proportion for the categorical variables, and quantitative variable which were able to be categorized. The t-student for two dependent populations and two independent populations was performed.

Participation of the community in the *Posyandu* activities is very important as an effort for the improvement of the basic health and nutritional status, particularly among the children under five. Almost all of the mothers of children under five (97,6%) stated that the existence of *Posyandu* was very important for them. The factors influencing the community participation are internal and external factors. Internally, the condition, situation and motivation of the mothers of children under five influenced the frequency of their visit to *Posyandu*. Not all of the mothers of children under five routinely visited *Posyandu* every month. The reasons, among others, are: being occupied, laziness, the children did not want to be taken to *Posyandu* or they were sick, being afraid that their children got fever after immunization, and being ashamed if their children's body weight decreased. The main motivation

of the mothers of children under five visiting *Posyandu* is in order that their children grow healthily, get immunization/vitamin A, and their children's body weight is monitored.

The activities of the *Posyandu* implementation are such as provision of supplementary foods, preparation of the place, discussion on the *Posyandu* problems etc., which were done by the *Posyandu* cadres. Thus, basically the cadres have carried out the process of preparation or planning, implementation up to evaluation of the *Posyandu* activities.

The external factors which are in forms of supports from the *Posyandu* stakeholders, the availability of *Posyandu* facilities, and counselling activities are also very important in encouraging the community to participate in *Posyandu*. The cadres are the most essential stakeholders in encouraging the mothers of children under five to visit *Posyandu*, however their number and their performance were still limited. The cadres have actively given information to the mothers of children under five on the schedule of the *Posyandu* activities and invited them to come to *Posyandu*, prepared supplementary foods and *Posyandu* equipments, weighed the children/pregnant mothers, and recorded all connected with the *Posyandu* activities. The other stakeholders who play a role in the *Posyandu* activities, among others, are: midwives, the RT leaders (the smallest subvillage), family planning counsellors, officers from puskesmas (the community health center), religious figures, and village leaders. Supports from the husbands or parents also played a role in encouraging the mothers of children under five to visit *Posyandu*.

PMT (Supplementary Feeding Program) is one of powers of attraction which is able to increase the community interest to have their children weighed at *Posyandu*. However, the PMT was not routinely held with the reason that the budget allocated by the government was not sufficient to provide the supplementary foods routinely every month. A collective contribution system from the mothers of children under five was not available to provide supplementary foods in the research villages.

The presence of extension activities also motivated the mothers of children under five to visit *Posyandu*. Therefore, empowering the cadres to understand nutrition and health better is of paramount importance, so they can become reliable counsellors at their *Posyandu*. The nutritional training conducted during the intervention program in this action research is a real step to the empowerment of the *Posyandu* cadres.

The adequacy and completeness of the *Posyandu* facilities/infrastructure also motivated the mothers of children under five to visit *Posyandu*, because they improved the comfort and promptness in service. However, almost all of the *Posyandus* still faced problems of the availability for the facilities. Some of them were permanent *Posyandu* buildings were not available and therefore most of the *Posyandus* used the house of one of the cadres; the availability of weighing scales, microtoise, tables, chairs, as well as divan and mattress for the examination of the pregnant mothers was also limited.

The villages which became this research site had a relatively fertilized land texture so the activity of yard utilization was potential to develop. On average the control and intervention groups possessed a narrow yard (<120 m²). The average of the land area under control in the intervention group was approximately 32 m² per household, in details Sukaresmi Village 44.1 m², Sukaluyu Village 23.6 m², and Sukajaya Village 11.9 m².

Based on the baseline data it is known that the yards in the research site had not been maximally utilized, most of the land around the house had not been utilized or left empty. In the three intervention villages the number of the households which utilized the yards to cultivate vegetables was 30.1%, tubers 25.8%, and decorative plants 23.7%. Whereas, in the control village the number of the households which utilized their yards for decorative plants 25.8%, vegetables 19.4%, and tubers 12.9%. This low utilization was because the households did not have plant seeds/seedlings, did not have time and were occupied taking care of their house as well as their children, did not know how to plant, and other various reasons.

The intervention in a form of nutritional extension resulted in a positive impact in the case of nutritional knowledge. The trend of the nutritional knowledge increase was observed in the intervention group, where the number of the mothers who gained nutritional knowledge categorized as 'good' increased. In the intervention group the score of the mothers' nutritional knowledge increased as many as 12.4 on average, while in the control group the increase was just 1.8. The increase of the nutritional knowledge score in the intervention group was significantly higher than that in the control group ($p < 0.05$).

In regard to the nutritional knowledge of the cadres, the number of the cadres in the intervention group whose nutritional knowledge was categorized as 'good' increased from 14.3% to 78.6%. Statistically the nutritional knowledge

increase of the cadres in the intervention group was significantly higher than that in the control group ($p < 0.05$).

Concerning with the nutritional attitude, in the intervention group it increased as many as 6.9. The result of the t-test showed that there is a significant different ($p < 0.05$) between the nutritional attitude score increase of the mothers in the intervention group and that of the mothers in the control group, where the mothers in the intervention group gained higher scores of the nutritional attitude. On the other hand, among the cadres it was not found that there was a significant difference between the nutritional attitude score in the control group and that in the intervention group ($p > 0.05$).

Nutritional attitude was relected in several things connected with eating habits. In the intervention group the increase in the number of the children who consumed vegetables in the households of the mothers of children under five reached 11.0%, while in the control group the increase was less than 9%. The majority of the mothers, either in the control group or in the intervention one provided tofu/tempeh for their children. The increase occurred both in the control group and in the intervention one, but the increase was higher in the intervention group. The number of the mothers in the control group who stated that their children were accustomed to having breakfast increased approximately 9.3%, while in the intervention group the increase reached 15.8%. The significant increase (35.8%) in having breakfast also occurred in the households of the cadres in the intervention group.

The action-research activity which is a nutritional education has been able to improve the nutritional knowledge of the mothers of children under five and also of the *Posyandu* cadres. The importance of the nutritional education in a long term is to improve the eating habit which at the end can improve the nutritional status of the children. *Posyandu* cadres as the spearhead of the nutritional service at the community level play an important role in preventing the spread of nutrition deficiency particularly among the children under five. Therefore, the empowerment of the cadres in a form of nutritional education, and training on optimizing the *Posyandu* services need to be done. The increasingly good quality of *Posyandu* is reflected in one of its quality elements, that is, the increase of the cadres' ability in giving a nutritional program service for children under five. It is expected that the cadres who are increasingly skillful will be able to attract the community to participate in the *Posyandu* nutritional program constantly so the nutrition deficiency among the children under five can be overcome better.

The equipments possessed by the *Posyandus* to operate the nutritional service program were still limited. In this action research the *Posyandus* in the research site which have been facilitated by a collaborative project, the Nestlé Foundation-Bogor Agricultural University, with various kinds of facilities to support the *Posyandu* operation, such as media for nutritional extension (poster, flipchart, module, and leaflet), tables, chairs, divan, mattress, weighing scale, microtoise etc. It is expected, with the equipments/facilities which are more complete, the *Posyandus* are able to provide better nutritional services.

Increasing the community participation in the *Posyandu* activities can be done by solving the *Posyandu* problems which are rooted from the internal and external factors as have been explained in point 1. Internally, in this action research some efforts to motivate the mothers of children under five to come to *Posyandu* routinely have been done. Therefore, the research team together with the *Posyandu* cadres in the activities of the nutritional extension have emphasized the importance of *Posyandu* for the growth and development of children and the need of the community to utilize *Posyandu* as nutritional and health services for children.

The performance of the *Posyandu* cadres was still limited, therefore the research team held trainings on health, nutrition, and optimizing *Posyandu* services. With the trainings it is expected that the *Posyandu* services get better so this is able to encourage the community to be willing to participate in the *Posyandu* activities.

The role of the community figures is very crucial in increasing the community participation in *Posyandu*. Therefore, it has been conducted socialization on the programs connected with the development of *Posyandu* to the community figures, and improvement of their understanding on the importance of *Posyandu* for the community. Thus, their concerns will emerge to develop *Posyandu* and they also pay attention to the health and quality of the community life, particularly among children under five. It is expected that with high understanding and concerns, the formal and informal figures are able to convince the community members on the importance of their participation in the *Posyandu* which is held once a month in each village.

The community participation in the *Posyandu* activities is also influenced by the availability and completeness of the *Posyandu* facilities. The facilities which are complete and of good quality improve the comfort and promptness in giving services to the mothers at the *Posyandu*. However, in fact the

Posyandus in the research site still possessed limited facilities. The research team made an endeavour to overcome the problems by giving facilities as have been mentioned in point 4 so it is expected that the *Posyandu* services can be better.

In the activity of the yard utilization (home gardening) in the research site there were 15 kinds of vegetables which were planted, namely, small-sized chilli, *katuk*, spinach, *kangkung*, string bean etc. The kinds of vegetables which were easily planted were spinach, *kangkung*, and *caisin*. Most of the respondents felt pleased with the yard-utilization (home gardening) program because they got guidance, direction, and enough facilities to develop their yard, as well as their harvest can be used to fulfill their household needs without spending any money to buy vegetables.

During the period of April 2012 to June 2013 the highest productions of vegetables in the yard were *caisin* in Sukaresmi Village (about 150 kgs), tomato in Sukaluyu Village (about 155 kgs) and in Sukajaya Village (about 100 kgs). Other vegetables whose production was also caterogized as 'high' were spinach, cucumber, bitter melon, *kangkung*, chilli, and eggplant. These vegetables whose production was high indicate that the vegetables are suitable to be planted in the yard and are potential be recommended to other households to plant.

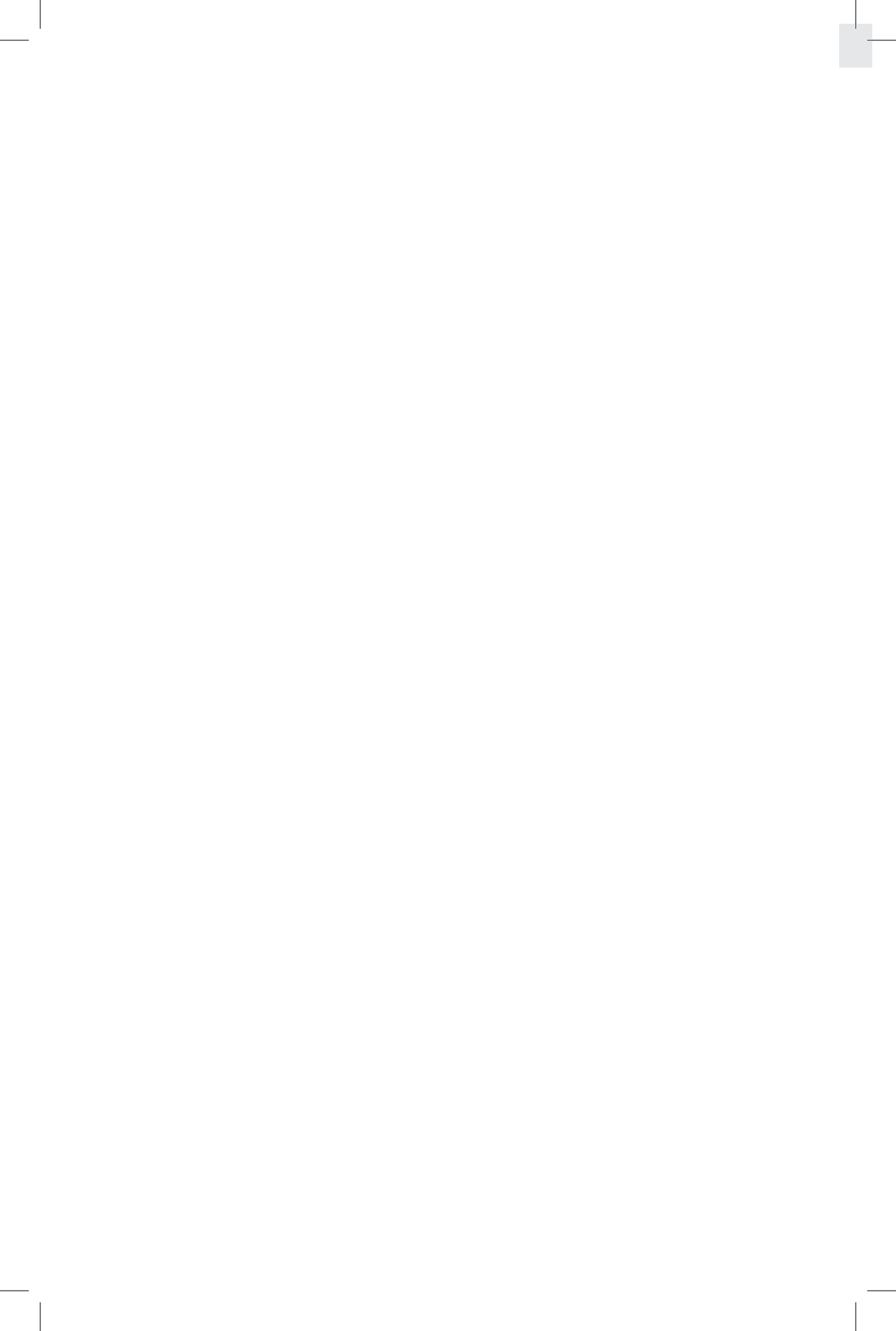
The trend of the total vegetable harvest in the three intervention villages has a nearly similar pattern. In the period of April to September 2012 the harvest increased, then in October to December 2012 decreased due to the dry season, and in January to June 2013 the harvest increased again.

The role of the cadres in the yard utilization program helped very much in the field; this was connected with an effort to maintain/build the respondents' motivation. Most of the cadres in the three villages were enthusiastic to the program sustainability, even though in the course there were some of the cadres who were less active in the field because of their business or other factors. Interest and motivation were two of the factors which affect the yard utilization. Strong interest and motivation will make the community easy to utilize their yard optimally because the yard need to be taken care so that it has a continual production.



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List of Content

SUMMARY	iii
ACKNOWLEDGMENT	xi
LIST OF CONTENT	xiii
LIST OF TABLES	xvii
LIST OF PICTURES	xxiii
LIST OF APPENDICES	xxv
1 INTRODUCTION.....	
1.1 Background.....	
1.2 Goals and Objectives.....	
1.3 Research Hypotheses	
2 LITERATURE REVIEW.....	
3 METHOD	
3.1 Research Design.....	
3.2 Research Sites and Time.....	
3.3 Sampling Technique.....	
3.4 Research Procedures	
3.4.1 Focus Group Discussion (FGD).....	
3.4.2 Nutritional Extension	
3.4.3 Implementation of Home Gardening.....	
3.4.4 Workshop of <i>Posyandu</i> Management and Cadre Training	
3.5 Kinds and Methods of Data Collection	
3.6 Data Analyses.....	

4	DESCRIPTION OF THE STUDY SITES
4.1	Geography
4.2	Governmental Matters
4.3	Socio-Population Affairs
4.4	Agriculture
5	SOCIO-ECONOMIC AND DEMOGRAPHIC CHARACTERISTICS OF HOUSEHOLDS
5.1	Socio-Demographic Characteristics of the Households
5.2	Household Incomes and Expenditures
6	EMPOWERING <i>POSYANDU</i>
6.1	Characteristics of the Cadres
6.2	Cadre Participation in the <i>Posyandu</i> Implementation
6.3	Perception of the Cadres on <i>Posyandu</i>
6.4	Participation on the Mothers of Children Under Five in the Posyandu Implementation
6.5	Roles of the Stakeholders in Improving the Participation of the Mothers of Children Under Five to <i>Posyandu</i>
6.6	Perception of the Formal and Informal Village Leaders on <i>Posyandu</i>
6.7	Facilitating <i>Posyandu</i>
7	HOME GARDENING
7.1	Ownership and Utilization of the Yard
7.2	Implementation of the Home Gardening Program
8	NUTRITIONAL KNOWLEDGE, ATTITUDE, AND BEHAVIOUR OF THE CADRES AND THE MOTHERS OF CHILDREN UNDER FIVE
8.1	Nutritional Knowledge
8.2	Nutritional Attitude
8.3	Nutritional Behaviour

9	EATING HABITS OF CHILDREN UNDER FIVE
9.1	Feeding Pattern
9.2	The Habit of Consuming Fruit and Vegetable
9.3	The Habit of Having Streetfood
9.4	The History of Formulated Milk Consumption.....
9.5	The History of Milk Consumption.....
10	FOOD CONSUMPTION
10.1	Food Frequency
10.2	Food Preference
10.3	Food Taboo
10.4	Nutrition Adequacy Level.....
10.5	Nutritional Adequacy Level of the Households.....
11	NUTRITIONAL AND HEALTH STATUS.....
11.1	Characteristics of Children Under five.....
11.2	Nutritional Status.....
11.3	Health Status.....
12	SUSTAINABILITY OF THE PROGRAM.....
13	CONCLUSIONS AND RECOMMENDATIONS
13.1	Conclusions.....
13.2	Recommendations.....
14	BIBLIOGRAPHY.....
	APPENDICES.....



List of Tables

Table 2.1	Clasification of <i>Posyandus</i> and the implementation indicators.....
Table 3.1	The selected <i>Posyandus</i> , number of respondents, and cadres by village.....
Table 3.2	Methods of measurement and methods of data collection
Table 5.1	Characteristics of the household socio-demography
Table 5.2	Statistics of household income and expenditure (IDR/cap/month)
Table 5.3	Statistics of household food expenditure (IDR/cap/month)
Table 5.4	Statistics of household nonfood expenditure (IDR/cap/month)
Table 5.5	Distribution of literate husbands and wives.....
Table 5.6	Distribution of husband's and wife's occupations
Table 5.7	Distribution of houses by their status and characteristics.....
Table 5.8	Distribution of household lighting and fuel
Table 5.9	Distribution of water resources
Table 5.10	Distribution of household sanitation.....
Table 6.1	Statistics of the cadres socio-demographic characteristics.....
Table 6.2	Participation of the cadres at <i>Posyandu</i>
Table 6.3	Distribution of the cadres by incentive received
Table 6.4	Distribution of the cadres by task in the <i>Posyandu</i> implementation
Table 6.5	Distribution of the cadres by nutritional counselling at <i>Posyandu</i>
Table 6.6	<i>Posyandu</i> problems and a condition-change trend in the last three years in Village Sukajaya.....

Table 6.7	<i>Posyandu</i> Problems and a condition-change trend in the last three years in Village Sukaluyu.....
Table 6.8	<i>Posyandu</i> problems and a condition-change trend in the last three years in Village Sukaesmi
Table 6.9	Perceptions of the cadres on the <i>Posyandu</i> activities necessary to be improved.....
Table 6.10	Distribution of visit frequencies of the mothers of children under five to the <i>Posyandus</i> during the last one year.....
Table 6.11	Distribution of visit frequencie of the mothers of children under five to <i>Posyandu</i> within the last three months
Table 6.12	Distribution of the mothers of children under five to join <i>Posyandu</i> until their children reach 5 years old
Table 6.13	Household supports to the visit of the mothers of children under five to <i>Posyandu</i>
Table 6.14	Distribution of the reasons for the mothers of children under five visiting <i>Posyandu</i>
Table 6.15	Distribution of the mothers of children under five by KMS (children growth chart) ownership
Table 6.16	Participation of the mothers of children under five in the <i>Posyandu</i> implementation.....
Table 6.17	Perception of the mothers on the service of supplementary food provision at <i>Posyandu</i>
Table 6.18	Perception of the mothers on the counselling program at the <i>Posyandus</i>
Table 6.19	Perception of the mothers on the roles and services of the <i>Posyandu</i>
Table 6.20	Perception of the mothers on the adequacy of the <i>Posyandu</i> facilities
Table 6.21	Perception of the mothers on the programs requiring improvement at the <i>Posyandu</i>
Table 6.22	Components, problems, and suggestions for overcoming the problems at the <i>Posyandu</i>
Table 6.23	Perception of the mothers on the performance of the <i>Posyandu</i> cadres

Table 6.24	Perception of the formal and informal village community figures on <i>Posyandu</i>
Table 6.25	Equipments owned by the <i>Posyandus</i>
Table 7.1	Statistics of the land width (m ²)
Table 7.2	Utilization of the yard areas (baseline).....
Table 7.3	The width of home gardening areas through the IPB Program (endline)
Table 7.4	Data of the harvest in the period of April 2012 to June 2013 in Sukaluyu Village
Table 7.5	Data of the harvests in the period of April 2012–June 2013 in Sukaesmi Village.....
Table 7.6	Data of the harvest in the period of April 2012 to June 2013 in Sukajaya Village
Table 8.1	Categories of nutritional knowledge of the mothers
Table 8.2	Categories of the cadres' nutritional knowledge.....
Table 8.3	Categories of the mothers' nutritional attitude
Table 8.4	Distribution of the mothers by statement of the nutritional attitude
Table 8.5	Categories of the cadres' nutritional attitude
Table 8.6	Distribution of the cadres by statement of nutritional attitude
Table 8.7	Distribution of the mothers by nutritional behaviour.....
Table 8.8	Distribution of the cadres by nutritional behaviour.....
Table 9.1	The distribution of feeding patterns of children under five
Table 9.2	The distribution of vegetable and fruit consuming habits of children under five.....
Table 9.3	Fruits consumed frequently by children under five.....
Table 9.4	Distribution of having-streetfood habits among the children under five.....
Table 9.5	Distribution of the most frequently bought streetfoods.....
Table 9.6	Distribution of the history of formulated milk consumption.....
Table 9.7	Distribution of the history of milk consumption.....

Table 10.1	The frequency and amount of cereal consumed by the children under.....
Table 10.2	The frequency and amount of animal-sourced food consumed by the children under five.....
Table 10.3	The frequency and number of beans consumed by the children under five
Table 10.4	The frequency and amount of vegetable and fruit consumed by the children under five
Table 10.5	The frequency and amount of streetfood consumed by the children under five
Table 10.6	Distribution of children under five by kinds of vegetables preferred
Table 10.7	Distribution of the children under five by kinds of fruits they preferred.....
Table 10.8	Distribution of the children under five by kinds of sidedishes they liked.....
Table 10.9	Distribution of the children under five by kinds of snacks they preferred.....
Table 10.10	Distribution of the children under five by the kinds of sidedishes they disliked
Table 10.11	Distribution of the children under five by snacks they disliked
Table 10.12	Distribution of the respondents by kinds of vegetables and fruits they dislike.....
Table 10.13	Taboo foods for the children under five.....
Table 10.14	Intakes and the nutrient adequacy level among the children under five.....
Table 10.15	The percentage of children under five by classification of the nutrition adequacy level.....
Table 10.16	The households' intake and nutrient adequacy level
Table 10.17	The percentage of the households by classification of nutritional adequacy level
Table 11.1	Distribution of the children under five by sex
Table 11.2	Characteristics of the children under five

Table 11.3	Distribution of the children by the weight for age (WAZ) and treatment group
Table 11.4	Linear regression analysis of the nutritional status (WAZ) by the stepwise method
Table 11.5	Distribution of the children by the height for age (HAZ) and treatment group
Table 11.6	Distribution of the children by the weight for height (WHZ) and treatment group
Table 11.7	Distribution of the diseases the children under five suffered from since born.....
Table 11.8	Distribution the diseases the children under five suffered from in the last month.....
Table 11.9	Distribution of the lengths (day) of the diseases of the children under five by kind of diseases in the last one month
Table 11.10	Distribution of the frequency of having the diseases during the last one month (time).....



List of Pictures

Picture 3.1	Focus group discussion among <i>Posyandu</i> 's cadres.....
Picture 3.2	Focus group discussion among community leaders
Picture 3.3	Nutritional extension.....
Picture 3.4	Cooking demonstration.....
Picture 3.5	Preparing nursery for home garden
Picture 3.6	Preparing verticulture for home garden.....
Picture 3.7	The use of bamboo for fences.....
Picture 3.8	Preparing liquid fertilizer
Picture 3.9	Monitoring home garden.....
Picture 3.10	Workshop of <i>Posyandu</i> management
Picture 6.1	PRA technique (<i>trend timeline</i>)
Picture 6.2	KMS (children growth chart)
Picture 6.3	An example of diagram Venn created by the cadres
Picture 6.4	A reporting system flowchart
Picture 7.1	Verticulture technique
Picture 7.2	Housing of seeds.....
Picture 7.3	Vegetable harvests
Picture 7.4	The harvests of the yard crops
Picture 7.5	Home gardening.....
Picture 11.1	The trend of the children's nutritional status (WAZ)



List of Appendices

Appendix 1	The percentage of the mothers of children under five answering the nutritional knowledge items correctly.....
Appendix 2	The percentage of the cadres answering the nutritional knowledge items correctly.....
Appendix 3	Posters for <i>Posyandu</i>
Appendix 4	Banners for <i>Posyandu</i>
Appendix 5	Home garden in villages
Appendix 6	Nutrition extension activities
Appendix 7	Reseachers, <i>Posyandu's</i> cadres, and research assistants.....

Introduction

1.1 Background

Posyandu is a community-based health effort which is from the community, managed and held by the community, and intended for the community in carrying out the health development to empower the community and to provide them an easy access to obtaining basic health/social services in order to accelerate the decrease of the maternal mortality rate and the infant mortality rate.

Since established, *Posyandu* has grown vast in numbers, from approximately 25,000 *Posyandus* in 1985 to 251,459 in 1994, which are spread all over Indonesia (Depkes 1996). However, the results of monitoring conducted by Departemen Kesehatan (Health Department) showed that the number of *Posyandus* decreased nationally, where in 1996 /1997 the number of *Posyandus* was 244,107 and in 1998/1999 it decreased to be 212,215 (Depkes 1999). In addition to the number of *Posyandus*, it was observed that the cadre dropouts were relatively high in the last five years, that is, ranging from 20% to 50% (Khomsan *et al.* 2007).

The decrease in the number and achievement of *Posyandus*, besides due to the economic crisis, was due to the community and the officers in the field who were surfeited. In addition, the independence level of *Posyandu* was also still low. Although conceptually *Posyandu* indicates a form of activity which comes from and is intended for the community, the reality is that in the implementation the dependence of *Posyandu* to the officers is still very high. In implementing the programs of *Posyandu*, the most-frequently-encountered barrier is the low elucidation/CIE (Communication, Information, and Education) which is the main basis of the nutritional program in *Posyandu*. The elucidation or counseling in *Posyandu* which has to be carried out at

table I (Group counseling) and at table IV (individual counseling) rarely took place (Haikal 1999). This is, among others, due to the low quality of the cadres as the training they have received is not adequate or their education is relatively low. The results of a research conducted by Khomsan *et al.* (2007) also revealed the low participation of the mothers of children under five was, among others, caused by the cadres' low knowledge on nutrition and health.

Another obstacle which affects the activity of *Posyandu* is fund. According to Pakhri (2002), in order that the *Posyandu* programs can be implemented well, *Posyandus* require personnels and funds, besides for operational matters, for procurements of their own facility, such as materials for counseling, foodstuffs for PMT—*Pemberian Makanan Tambahan*, that is, a *Posyandu* program of giving supplementary foods to children and pregnant women—books for writing notes and reports. The results of the same research by Khomsan *et al.* (2007) revealed that funds and infrastructure were the main obstacle of the toddler mothers' low participation in *Posyandu*. Suwandono (1989) states that funds and facilities of *Posyandu* are obtained from the supports from the village, Health Department, and BKKBN (The Family Planning Coordination Board). However, in general, fund-raising for *Posyandu* is merely from the visitors of *Posyandu* and the cadres, and accordingly this is insufficient to cope with the funds needed for PMT; whereas the community's self-supporting has not been explored optimally yet.

According to Martinah (2005), at present *Posyandu* plays a strategic role as the provider of nutrition services closest to the community, even the most important role in improving the community's knowledge and awareness of the significance and the urgency of basic health since *Posyandu* is managed from, by and for the community in order that they have a wide access, and it directly touches the health need of the community. *Posyandu* has to cover at least five things: registration, weighing, recording, counseling and immunisation. Immunisation must be given free of charge. This includes basic immunization, that is, BCG, hepatitis B, DPT-polio, measles, and tetanus for pregnant mothers. In addition to immunisation, *Posyandus* have to give counseling about maternal and infant health. In fact there are five basic programs of *Posyandu* that must be carried out by its cadres, namely, counselling, family planning service, immunisation, weighing infants, and nutrition.

In improving the achievement of *Posyandu* there are several things that should be considered, among others, the improvement of the cadres' knowledge, the

improvement of facilities (scales, media, KMS—cards for recording mothers and children' health and growth—etc). The results of a study conducted by Khomsan *et al.* (2007) shows that the kinds of activities that have to be improved in order that the achievement of *Posyandu* can be increased are improvement of the counseling achievement by upgrading the cadres' knowledge on nutrition and health, by keeping on giving routine additional foods and improving the quantity and quality of the foods given, keeping on giving iron tablets and vitamin A, keeping on conducting the immunization routinely, and obtaining funds from the government for the whole activities of *Posyandu*.

Poverty is the major problem responsible for the emergence of nutritional problems in Indonesia, although other related factors may take some roles, such as knowledge, culture, food habit, etc. Mother's education is an important factor and related to the quality of children upbringing (Kardjati, Alisjahbana, and Kusin 1985). A high level of formal education level without an adequate knowledge of nutrition was found to have an affect on the choice of food for the family (Sediaoetama 1996). The higher the nutritional knowledge of mothers, the better the food consumption of children and their family would be. The poverty may, in fact, become the root of nutritional problems. However, this is made worse by the people's little knowledge of nutrition and little effort in applying the knowledge in daily life.

The improvement of the household income through intensive utilization of the home garden area is promising enough because the home garden potentials, either its width or its plant productivity, are good enough. The average width of the rural people's home garden in Bogor ranges from 15 to 30 m². The relatively high potential of home garden plant productivity is expected to be able to increase the household income. Besides that, the produce of home garden plants can be directly used as a food resource to fulfill the daily need. Thus, it indirectly increases the households' food consumption and also increases the nutritional status of the households, especially children under five.

Definition of home garden is an inhabited small land with a certain border and it has functional relations with the occupant itself. Brownrigg (1985) indentifies the characteristics of home garden as follows: 1) near the residence, 2) showing plant cultivation diversity, 3) a source of consumption for family, and 4) having certain borders.

Karyono (1985) said that home garden is a small land around the house that is usually surrounded by fences, planted by many kinds of seasonal or yearly certain plants, while according to Danoesastro (1976) home gardens have a functional relation with the owner both productive or consumptive plants. That productive land is near by the house or a bit far, but it still closes to the inhabitant.

Home garden itself is also called as a vital granary, a vital small shop, a vital pharmacy, and vital saving, because of providing certain occasional needs. It is called a vital granary, because when nothing left with the supply, it provides foods such as vegetables, fruits and many other kinds of foods. Those foods are available in the home garden. It is called a vital small shop, because sometimes when we have no money, we can get some vegetables from the home garden. It is called vital pharmacy, because sometimes when someone gets sick such as a wound or fever, we can use some certain plants or tree to heal it. Called vital saving, because sometimes when there is some plant or trees whose harvest produces can be sold with a high price such as clove, durian, and avocado. Coconut and banana keep on bearing fruits, so it can both be consumed or sold to the market (Harjadi 1981).

Khumaidi and Husaini (1976) stated that well utilized home garden and good information of nutrition will have a great contribution to improve nutritional status in the community, especially for children. Harjadi (1981) said that in a small size home garden, planting vegetables is important to fulfill the daily menu in the family.

Home garden functions can diverse and may be different between one and another, it depends on the owner. Generally, there are several aspects related to the functions of home garden, such as nutrients fulfillment and extra income for family (Harjadi 1989). According to Karyono (1985) the greatest advantage of home garden function is production, both for family consumption or commercial function. Commercial function is to gain family income. Therefore, a home garden has two functions at the same time.

The function of a home garden is to produce food, such as vegetables, fruits which contain vitamin A and C, and mineral. Some of beans also produce good proteins. The role of a home garden to support nutrients and food needs has been examined in so many research projects. The role of a home garden to increase vegetables consumptions can save family expenses. A research about the role of home garden in West Java by Abdoellah (1991) found that in

general, family meets their nutrients needs from their own plants. Suryana's research in Semplak (Bogor) shows that the narrower their home gardens are, the more productive they are. Harjadi (1989) said that it is better to plant green vegetables in a narrow home garden.

1.2 Goals and Objectives

1. To identify factors affecting community participation in the *Posyandu* program.
2. To identify land ownership and plant/animal diversity of rural community.
3. To identify knowledge, attitude and practise of nutrition among mothers and *Posyandu's* cadres.
4. To revitalize *Posyandu's* activities through mothers nutrition education, cadres training, and facilitating *Posyandu* equipment.
5. To improve community participation in the *Posyandu* program.
6. To empower community through home gardening for income generating and food availability.

1.3 Research Hypotheses

Equipping *Posyandu* with facilities, a training in nutrition for cadres and mothers of children under five, and a program of home-garden plants are able to improve:

1. Knowledge, attitude and nutritional practice of the *Posyandu* cadres and the mothers' under-five children.
2. Participation of mothers of under-five children and *Posyandu* cadres.
3. The nutritional status of *Posyandu* members' children.
4. The food availability for the household's of the *Posyandu* members.

2

Literature Review

Posyandu

Peraturan Menteri Dalam Negeri Nomor 19 Tahun 2011 (An Indonesian Domestic Affairs Minister Regulation) on a guideline for the Intergration of Basic Social Service at *Posyandu* states that *Posyandu* is a community-based health effort which is managed and held by, for, and in cooperation with the community in conducting the health development in order to empower the community, and to provide the community with an easy access to obtaining a basic health service in order to accelerate the decrease of the maternal and infant mortality rates. Besides that, *Posyandu* is a social medium of the community empowerment which is established through a village meeting and is managed by the *Posyandu* organizers.

The *Posyandu* organizers are community members, social institutions, social organizations, nongovernmental organizations, government-partner organizations, and corporations which are selected, willing, able, and have time and concerns towards a basic social service for the community in the *Posyandu*. *Posyandu* cadres, for the rest called cadres, are community members who are willing, able, and have time to hold *Posyandu* activities voluntarily.

Posyandu is held once a month, which is decided by LKMD—Lembaga Ketahanan Masyarakat Desa (A Village Social Activities Group), cadres, the activator team of the village PKK (a social group managed by women to improve household prosperity) as well as medical officers from the KB (the Indonesian family planning board). On the day of *Posyandu* service hours are carried out community services with a five-table service, that is, table 1 for registration, table 2 for weighing, table 3 for filling in KMS (a card for recording the member's health history and children growth), table 4 for individual counselling based on his/her KMS records, and table 5 for family

planning services, and health services such as immunization, high-dosage vitamin A supplementation in a form of oral droplets on Februarys and Augusts, pill and condom distribution, light treatment, and consultation of family planning health. The officers at tables 1 to 4 are PKK cadres while at table 5 are medical staff (a doctor, nurse, village midwife, and family planning officer). The *Posyandu* targets are babies/children under five, pregnant mothers/breastfeeding mothers, childbearing women (WUS), and childbearing men (PUS).

The kinds of nutritional services as well as maternal and child health services available in *Posyandus* include:

- a. Micronutrition supplementation.
- b. Counselling on balanced nutrition, and on foods for infants and for children under five.
- c. Nutritional services including the growth monitoring, vitamin distribution, supplemental feeding, and nutritional counselling.
- d. Measuring body height and body weight, upper arm circumference, blood pressure, the height of the fundus of the uterus or the fundal height, blood-rising tablet supplementation, if necessary tetanus toxoid immunization, examination for pregnant mothers.
- e. Family planning services such as giving injections, pills, and condoms.
- f. Socialization of delivery planning and complication prevention programs.
- g. Administration of basic immunizations for infants of 0–9 months old.
- h. Monitoring of early intervention and detection stimulations to the growth and development of 3, 6, 9, and 12 month infants, and of children under one year at least twice a year.
- i. Counselling and guidance on taking care of a newborn baby and dangerous signs in infants and children under five.

Surat Edaran Menteri Dalam Negeri dan Otonomi Daerah Nomor: 411.3/1116/SJ (a ministerial circular) dated 13 June 2001 on the general guideline for *Posyandu* revitalization states that *Posyandu* revitalization is an effort of basic health fulfillment and improvement of the community nutritional status, which is in general collapsed as a direct or indirect result of the multi-dimension crisis in Indonesia. Strategies necessary to be taken in order to achieve the goals of *Posyandu* revitalization are as follows:

- a. Improvement of cadres' ability, knowledge, technical skills as well as dedication in *Posyandu*.
- b. Extension of the *Posyandu* system through the improvement of service quality and quantity during open days and home visit.
- c. Creation of a conducive atmosphere for the service by providing facilities and infrastructures of *Posyandu*.
- d. Improvement of community roles and partnership in the implementation and financing of *Posyandu* activities.
- e. Provision of service options (minimum packages and additional packages) in line with the advancement of the community needs.
- f. Implementation of adequacy and urgency/priority principles in determination of service targets by paying special attention to children under two (*Baduta*) to reach the overall coverage.
- g. Strengthening the support to the technical assistance and establishment from professionals and community figures, including elements from Non-Government Organization.

Improvement of *Posyandu* revitalization activities can be assessed from the input, process, and output aspects as well as the outcome as follows:

A. Input Indicators

1. Number of *Posyandus* whose facilities and medicines have been complete.
2. Number of cadres who have been trained and active working.
3. Number of cadres who get access to improving their economy.
4. Availability of financial supports from the local community, government and donor institutions for *Posyandu* activities.

B. Process Indicators

1. Increase in the training frequencies for *Posyandu* cadres.
2. Increase in the frequencies for *Posyandu* assistance and establishment.
3. Improvement in the types of service provided.
4. Increase in community participation for *Posyandu*.
5. Strengthening the capacity of monitoring child growth.

C. Output Indicators

1. Increase in the coverage of infants and children under five served.
2. Ability to reach all of the children under five.
3. Increase in the coverage of pregnant mothers and breastfeeding mothers served.
4. Increase in the coverage of cases monitored in home visits.

D. Outcome Indicators

1. Increase in the nutritional status of children under five.
2. Reduction in the number of underweight or overweight children.
3. Reduction in the prevalence of child health problems (suffering from intestinal worms, diarrhea, and acute respiratory infections).
4. Reduction in the prevalence of anemic pregnant mothers and breastfeeding mothers.
5. Well-established childcare patterns at the household level.
6. Established *Posyandu* continuation.

Posyandu revitalization aims at improving the *Posyandu* performance and functions, particularly in monitoring the growth of children under five. The main activities of the *Posyandu* revitalization include training or orienting the *Puskesmas* (Community Health Center) officers, officers of other sectors and cadres coming from the community, retraining the officers and cadres, assistance and establishment of cadres, provision of facilities, especially a scale, KMS/KIA books (books or cards recording maternal and child health), *Posyandu* guidelines, KIA media, recording equipments, provision of operational funds, capital provision for the cadre business through UKM (a small-medium-scaled business), and encouraging non-government elements to take participation (Depkes 2005).

Posyandu revitalization needs to be continuously done as stated by Hartoyo *et al.* (2000) whose goals are to reactivate/revitalize the function of *Posyandu* and to improve the community independence in improving their nutrition. This can be carried out through the improvement of cadres' motivation, knowledge and skills, participation improvement of child-under five households and community figures in better implementation of procedure execution. *Posyandu* revitalization is needed to support JPS-BK (a social safety net in health sectors)

programs, either in food supplementation for recovery or in getting the right targets, as well as to strengthen *Posyandu* in terms of quantity and quality. A study by Khomsan *et al.* (2007) shows that *Posyandu* activities give positive outcomes towards the nutritional status of children under five assessed by W/A, W/H, and BMI/A. The more frequent the visits to *Posyandu* are, the better the three nutritional statuses are. Thus, the *Posyandu* existence needs to be revitalized from the nutritional and health programs, implementation as well as involvement of the government and community figures in order that the nutritional status of children under five gets better.

Services in *Posyandu* are promoted and managed by local nongovernment organizations, and rooted in the rural community, particularly by woman organization (PKK). The wider the *Posyandus* spread, reaching almost all villages, the closer and the more reachable they are to the households. Through the interconnection between the basic health service particularly for mothers and children, *Posyandus* are the spearhead in overcoming nutritional problems (Kodyat 1998).

Posyandu existence can be seen through the classification by Depkes (1997) which classifies *Posyandu* into four categories, namely, *Pratama*, *Madya*, *Purnama*, and *Mandiri*, according to the indicators determined as displayed in Tabel 2.1.

Table 2.1 Classification of *Posyandus* and the implementation indicators

No.	Indicators	<i>Pratama</i>	<i>Madya</i>	<i>Purnama</i>	<i>Mandiri</i>
1	Children Weighing Frequency (per year)	< 8	> 8	> 8	> 8
2	Number of Cadres	< 5	≥ 5	≥ 5	≥ 5
3	Coverage of Number of Children Weighed/Total	< 50%	< 50%	≥ 50%	≥ 50%
4	Coverage of Cumulative Family Planning	< 50%	< 50%	≥ 50%	≥ 50%
5	Coverage of Cumulative Maternal and Child Health	< 50%	< 50%	≥ 50%	≥ 50%
6	Coverage of Cumulative Immunization	< 50%	< 50%	≥ 50%	≥ 50%
7	Supplementary Program	-	-	+	+
8	Coverage of Health Funds	< 50%	< 50%	≥ 50%	≥ 50%

Posyandu Pratama (Red Colour)

Posyandu Pratama is a *Posyandu* which is not well-established, its activities are not regularly held in every month, and the active cadres are limited, that is less than five people. This condition is considered 'critical', so the intervention is training more cadres. This means that the available number of cadres need to be increased and another basic training needs to be carried out.

Posyandu Madya (Yellow Colour)

Posyandu at level *Madya* is able to hold the activities more than 8 times a year, and the average number of cadres on duty is five or more. However, the coverage of the main programs (Family Planning, Mother-Children Health/KIA, nutrition, and immunization) is still low, that is, less than 50%. This means the continuation of the *Posyandu* is good but its coverage is still low. Therefore, it is necessary to activate the community intensively, as well as to extent programs appropriate to the local condition and situation. Intervention to *Posyandu Madya* involves two things, as follows:

- Training the community figures by a module of *Posyandu* exaltation, which is now accompanied by a simulation method.
- Implementation through the approach of a rural community health development (PKMD), such as a self-assessment survey, and an agreement reached through a meeting of village people to determine the problem and find out its solution, including decision on the supplemental programs which are appropriate with the local condition and situation. To implement this can be done by referring to the guideline book entitled "*Pendekatan Kemasyarakatan*" (Community-based Approach) published by Direktorat Bina Peran Serta Masyarakat, Depkes (An Indonesian Directorate Guiding Community Roles, Health Department).

Posyandu Purnama (Green Colour)

Posyandus at level *Purnama* are *Posyandus* whose service frequency is more than 8 times per year, the average number of the cadres on duty is 5 or more, and the coverage of the five main programs (family planning, mother-children health, nutrition, and immunization) is more than 50%. The *Posyandus* have supplementary programs, even there may have been a simple health fund. The interventions for the *Posyandus* at this level are:

- Running the *Posyandus* by employing a PKMD approach to direct the community to decide their own development program at the *Posyandus*.
- Training on health funds in order that in that village the health funds are able to grow strong, and the coverage of minimum members is at least 50% households or more. This activity may refer to the book entitled “*Pedoman Penyelenggaraan Dana Sehat*” (a guideline for the health fund implementation) and “*Pedoman Pembinaan Dana Sehat*” (a guideline for a health fund assistance) published by Direktorat Bina Peran Serta Masyarakat Depkes.

Posyandu Mandiri (Blue Colour)

This *Posyandu* has been able to carry out the activities regularly, the coverage of the five main programs is good, its supplementary and health fund programs have reached more than 50% of the households. The intervention for *Posyandu Mandiri* is building the health funds, that is, the health funds are directed to use the principle of a social health maintenance guarantee (JKPM).

With the *Posyandu* categorization the government is able to provide supervision or assistance so that the *Posyandus* are able to develop better. The health minister (2003) determines several activities to improve *Posyandu* existence, that is:

1. Empowerment of the cadres as motors to run a *Posyandu* through activities of *Posyandu* revitalization so the cadres are able to manage it skillfully.
2. Extension of *Posyandu* service coverage, especially activities outside the *Posyandu* working schedule, through home visits by the cadres or other activities.
3. Determination of the *Posyandu* target priority, for example children under three since they belong to the most vulnerable group.
4. Formation of *Posyandu* organizers at the village level to enable them to make a cooperation among the *Posyandus* and to create a synergic net.
5. *Posyandu* as a place to struggle for a community-based health, which has five main activities can be developed according to the situation, for example, including prevention of acute respiratory infections which children under five commonly suffer from.

6. Roles of midwives in villages in providing simple health services and in encouraging the community.
7. Continuing activities of *Posyandu* revitalization and combat contagious diseases.
8. Training/upgrading the cadres, community figures and fund-raising from the community for the health activities.
9. Data-collection and granting an appreciation to the health cadres who have consecutively dedicated themselves for 10 years. The appreciation may be a certificate, training, comparative study, health card, discount card, empowering the cadre's economy, or other forms appropriate with the local situation.

The activities of *Posyandu* revitalization basically cover the whole *Posyandus* with the primary attention to *Posyandus Pratama* and *Madya*. The *Posyandu* revitalization is carried out by a variety of strategies, among of them are grouping the service activities at *Posyandus*, increasing the frequency of *Posyandu* activities, refunctionalization of the *Posyandu* organization, empowering the cadres, providing operational facilities of *Posyandus*, creating attractive activities in order that the targets always attend every *Posyandu* activities, mobilizing the community resources, and utilizing the potentials available in different levels of governmental administration for the sake of *Posyandus*.

Utilization of Home-Gardening Areas

Home gardening is a continuous production system in tropical areas which plays a role in the conservation of biodiversity (Kehlenbeck and Maass 2004). Whereas, according to Arifin *et al.* (2009) a home garden is an area around a house, has a limited area, is of definite ownership, can be planted by various kinds of plants or a place to raise a variety of cattles and fish. A home garden is also an open space which can be utilized for many post-harvesting activities, a child playground, or a place for kinship events and social activities.

Home gardening is an area around the house where spices, herbal plants, vegetables, and fruits can grow in season or along the year in order to meet household needs. The main characteristics of home gardening are:

1. Close to the house
2. Close to water sources and other resources
3. The areas may be narrow or wide
4. It is utilized for vegetable production
5. It requires a little capital
6. Its products are mainly for household consumption
7. It is managed by the whole household members (Helen Keller International/Cambodia 2003)

A home garden holds four functions, namely: (1) subsistent production, to supplement the staple food (vegetables, fruits, spices, animal products), and other nonfood products, as well as contributing to the food endurance; (2) home gardening may generate commercial products to gain additional incomes; (3) socio-cultural functions, for esthetics, a child playground, an area for socialization and religious ceremonies; and (4) ecological and environmental functions, as a habitat for plants and animals (Arifin *et al.* 2012).

Home garden utilization is a home garden which is managed through an integrated approach so it is expected to be able to guarantee the availability of various food materials continuously in order to fulfill the household nutrition. According to De Foresta *et al.* (2000), the function of home gardening is nutrition improvement, an income increase, a reserve when it is in a difficult economy, soil conservation etc.

Arifin *et al.* (2009) divides home gardens into three, that is, small home gardens ($<120 \text{ m}^2$), medium home gardens ($120\text{--}400 \text{ m}^2$), big home gardens ($400\text{--}1.000 \text{ m}^2$), and very large home gardens ($>1.000 \text{ m}^2$). Then, a home garden is divided by its zonation into a front yard, yards on the left and right sides of the house and a back yard or garden.

The front yard is commonly used as a rice barn, to plant decorative plants, fruit plants, a playground, a garden bench, and a place to dry agricultural products in the sun. The yards on the left and right sides of the house are used to put clothes on the clothing lines to dry in the sun, trees to produce firewood, beds for food plants, herbal plants, a fishpond, a well and bathroom. The backyard is used as a place for beds of vegetables plants, bamboo trees, cattle sheds and industrial plants (Arifin *et al.* 2009).

Kehlenbeck *et al.* (2007) divides functions of a home garden into two main functions, that is, production and service. Production functions consist of a home garden for daily life (fruits, vegetables, spices, medicine, staple materials, stimulants, wood, and cattle feedings) and commercials. Service functions are classified as socio-cultural services (a gift, religious offerings, pride, pleasure, esthetics, job, and social interaction) and environmental services (wild habitat, pest and disease control, nutrition cycles, maintaining microclimate, soil erosion control).

Home gardening can be used as a sustainable strategy in order to improve food security and income. Home gardening can be done by poor people because of a cheap cost, simple equipment, and can be carried out in any environmental conditions (dry or wet lands). Home gardening contributes in household food security by providing access to foods which can be harvested, kept, and consumed by the household members for fulfillment of daily needs (Marsh 1998).

Kementan (2012) explains that home garden utilization is able to establish food security as follows: (1) fulfilling food and nutrition needs of the household; (2) increasing the household income; and (3) increasing consumption of foods which are diverse, nutritious, and balanced in line with the local food potentials. The results of Robinson-O'Brien's (2009) review towards 11 studies on intervention of nutrition-based home gardens show that home-garden programs are potential in increasing vegetable and fruit consumption among teenagers and increasing their intention to try vegetables and fruits towards younger children, even though the empirical data are relatively still small.

The Agricultural Ministry at the beginning of 2011 arranged a concept which is called "*Kawasan Rumah Pangan Lestari*" (KRPL) (areas of eternal food homes). While Badan Litbang Pertanian (an agricultural research and development board) through is given a mandate to develop a model of KRPL in the whole provinces in Indonesia (Kementan 2011). KRPL is established from a number of households which are able to realize food security through home garden utilization, able to diversify local resource-based foods and at the same time able to maintain food plants for future life, as well as able to reach the improvement of household and community prosperity.

The basic principles of KRPL are: (i) utilization of home garden which is eco-friendly and designed for food security, (ii) food diversification which is based

on local resources, (iii) conservation of food genetic resources (plants, cattles, fish), (iv) maintenance the perpetuity through a village seedling garden, and (v) improvement of community income and prosperity.

The expected outcome of the development KRPL, among others, are:

1. Fulfillment of food needs and household and community nutrition through optimal utilization of home gardens persistently.
2. Improvement of household and community ability in home garden utilization in rural and urban areas to cultivate food, fruit, vegetable plants, and household herbal plants, cattles and fish, as well as in processing the products and household wastes to be compost.
3. Maintenance of local food resource perpetuity and diversity.
4. Development of household productive economic efforts to support household prosperity and to create a healthy and preserved environment.

Planted commodities are adjusted to the household food need and nutrition, local food resource-based, and of economic value. The commodities, among others, are vegetables, spices and herbal plants, fruits, and local foods.

Nutritional Knowledge

Knowledge is as a result of knowing, and that happens after someone observes a certain object. Observation take place through five human senses, that is, senses of sight, smelling, hearing, tasting, and touching. Most of human knowledge is obtained through seeing and hearing (Notoatmojo 2003). Whereas, according to Engel, Blakcwell and Miniard (1995) knowledge is information kept in memory and becomes the main determination of one's behaviour. Further, Winkel (1984) states that one's knowledge level may be influenced by his/her intellectual ability. The knowledge level will affect one's attitude and behaviour since it is connected with ability to think logically, experience, and concept clarity on a certain object. One is able to gain nutritional knowledge through a variety of resources, such as, reference books, magazines, television, radio, newspaper and other people (husband, friends, neighbours, nutritionists, doctors, etc.).

The higher one's knowledge level is the easier s/he will accept information. With a relatively high thinking pattern, the respondents' knowledge is not just knowing (know), that is, remembering again but able to comprehend (comprehension), even up to the application level, that is, ability to use the

materials which have been learnt in a real situation or condition (Notoatmodjo 2003). This results in the effectiveness of information to be understood so the knowledge level will be relatively high (Kurniawati 2012).

Aspects of nutritional knowledge are, among others, food and nutrition (definition, kinds, functions, sources, effects of malnutrition), infant foods/nutrition (breastmilk, supplemental foods, right ages for the food given, types), foods and nutrition for children under five, foods and nutrition for pregnant mothers, child growth, child health, as well as knowledge of looking after children. A lack of nutritional knowledge results in the lack of ability to implement information in the daily life and is one of the causes of nutritional problems to appear (Suhardjo 2002).

Having a good nutritional knowledge is an significant factor in determining one's attitude and behaviour towards foods. In addition, nutritional knowledge has an important role to enable people live in prosperity and in a good quality. The greater their nutritional knowledge is, the more the people consider the kinds and quality of the foods they select and consume (Soediaoetama 2000).

One thing that is convincing about the importance of nutritional knowledge is based on the three following facts:

1. An adequate nutritional status is important for one's health and prosperity.
2. Every person will only have adequate nutritions if the foods consumed are able to provide nutrients required for an optimal body growth, maintainance, and energy.
3. Nutrition science provides facts needed so people are able to learn to use food well for nutrition improvement.

Misconception of food needs and food values is important factor in malnutrition problems. Another important factor of nutritional problems is a lack of nutritional knowledge or a lack of ability in applying the information in the daily life (Supariasa *et al.* 2002).

Mariani (2002) in her study elicits that having no nutritional knowledge may lead one to select wrong food stuffs and process them wrongly. On the other hand, mothers with a good nutritional knowledge will usually practice a healthy food pattern for their children so that their nutrition needs are fulfilled. One's high economic level will not automatically guarantee

the achievement of a better nutrition status if not accompanied by a good nutritional knowledge. Another study, concerning the correlation between mothers' nutritional knowledge and food patterns of children under five and the nutrition status of the children under five (12–59 months) in the working areas of Puskesmas Gandus-Palembang which was conducted by Khotimah *et al.* (2012) found out that there was a significant correlation between mothers' nutritional knowledge and the nutrition status of their children under five.

Food Consumption

According to Depkes (2011b), a balanced diet is a recommendation of a food composition which is suitable with one's nutritional need to live healthy, grow, develop, to be smart and productive. A pattern of food consumption is a food composition which one or a group of people usually consume in a certain frequency and duration. The food consumption patterns which are diverse, of balanced nutrition and safe in a traditional menu processed from fresh food stuffs which are of rich fibres and use herbal spices have, in fact, been changed into a fastfood consumption pattern which is high in animal fat, salt and sugar as well as lack of food fibres. People's low knowledge of food consumption patterns which are wholesome and balanced leads to a wrong behaviour.

Nutrition adequacy is the amount of each nutrients which must be met from foods to cover almost all healthy people. Nutrition adequacy is affected by age, sex, activity, body weight, and body height as well as in pregnancy and breastfeeding states. Community knowledge to select adequate and balanced foods for individuals and households is still poor. This is influenced by their education level, socio-economy, and culture.

Keputusan Menteri Kesehatan Republik Indonesia Nomor: 747/Menkes/SK/VII/2007 (a decision of an Indonesian Health Minister) on an operational guideline for nutrition-conscious community at Siaga Village states that at individual level, nutritional status is affected by nutrition intakes and interconnected infectious diseases. If one never gets adequate nutrition intakes, s/he will suffer from a lack of nutrition and easily gets sick. Thus, if one is often sick, this will result in a food-desire problem and then it will lead to poor nutrition. At family and community levels, nutritional problems are affected by:

- a. The ability of households in providing food for their members either its quantity and types according to their nutrition needs.
- b. The knowledge, attitude and skills of households in:
 1. Selecting, processing, and allocating the food among family members according to their nutrition needs.
 2. Giving attention and affection in looking after their children.
 3. Utilizing the facilities of health and nutrition services which are available and suitable (*Posyandu*, *Pos Kesehatan Desa*—a village health service post, *Puskesmas*—Community Health Center, etc.).
- c. The availability of health and nutrition services which are reachable and of good quality.
- d. The ability and knowledge of households in personal and environment cleanliness.

According to Rae (1999), the increase of household expenses may result in the increase of carbohydrate, protein, fat, and total calory consumption. There was a significant correlation between the food patterns and nutritional status (Khotimah *et al.* 2012).

Nutritional Status of Children under Five

Undang-Undang Republik Indonesia Nomor 9 Tahun 1960 (an Indonesian law) on Health Principles, section 3 article 1 mentions that perfect child growth in a healthy life environment is of paramount important to achieve a healthy generation and a strong nation. According to *Peraturan Menteri Kesehatan Republik Indonesia Nomor 155/Menkes/Per/II/2010* (a regulation of the Indonesian Ministry of Health) on the utilization of *Kartu Menuju Sehat-KMS* (growth monitoring chart) for children under five, the body weight change is a very sensitive indicator to monitor the child growth. If the child body weight increase is lower than it should be, the child growth is disturbed and the child has a risk of nutrition deficiency. On the other hand, if the child body weight increase is higher than it should be, it is an indication of having a risk of over nutrition.

According to Kemenkes (2011a), the ages under five is a growth and development spurt. Therefore, children under five need to get attention because the group are vulnerable to nutrition deficiency. Nutrition at young

children is an important factor which affects their growth and development. In addition, the eating habit and eating attitude at early age are believed to be able to influence food choices and this affects their nutritional status during their life (Kerrey *et al.* 1968).

A study on the analysis of factors affecting the nutritional status of children under five in rural areas conducted by Devi (2010) found out that the greater the number of a household members is, the greater the percentage of nutrition-deficiency status experienced by children under five is. The low income would influence the food choice which will ultimately affect the nutritional status of children under five. The study also found that for mothers who exclusively breastfed their children had more children with a good nutrition status.

The simplest indicator to decide whether the growth of children under five is normal or not is by observing the physical condition or which is called nutritional status by an anthropometric method. The easiest and most suitable parameter to assess nutritional status of children under five is body weight (W), body height (H) or body length and age (A), and the indexes used are W/A , W/H , and H/A . The calculation method uses a formula of z-score with a median standard of W or H divided by its standard (Supariasa *et al.* 2002).

Among the three parameters of the nutritional-status assessment, the body weight change is a very sensitive indicator to monitor child growth (Untoro 2010). If the child body weight increase is lower than it should be, the child growth is disturbed and the child has a risk of nutrition deficiency. On the other hand, if the child body weight increase is higher than it should be, it is an indication of having a risk of over nutrition. The body weight change to monitor the growth is done in weighing activities (Soetjningsih 2002). In Indonesia growth monitoring through weighing activities is the main activity of *Posyandu* whose number is over 250,000 which are spread throughout Indonesia.

3

Method

3.1 Research Design

The research was conducted by giving an intervention in a form of nutritional extension and home gardening for the households who had children under five and were active as *Posyandu* members. The first step of this research was baseline data collection. Next, after the intervention had been done, endline data collection was carried out to see the influence of the intervention given.

As many as 93 households having children under five were given the intervention in this research, and 31 households having children under five were not given any intervention; this functions as a control. The baseline data and the endline data of the households that got the intervention and those of the households that did not get any intervention (the control) were then compared to find out whether there was an increase or change on the endline data compared to the baseline data, as well as to know whether there was an effect and impact of the intervention given.

3.2 Research Sites and Time

The research was conducted in Sub-District of Tamansari, Bogor District. Of eight villages existing in this sub district, four villages were then selected. The considerations used to select the four villages was there was potentials of agricultural lands for home-gardening development.

The four villages selected were Desa (village) Sukaesmi, Desa Sukaluyu, Desa Sukajaya, and Desa Sukajadi. The first three villages, that is, Desa Sukaesmi, Desa Sukaluyu, and Desa Sukajaya were selected as the villages that got nutrition extension and home-gardening programs, while Desa Sukajadi was the village that did not get any program and became the control group. This research was conducted from January 2012 to December 2013.

3.3 Sampling Technique

Based on the four villages selected, as many as nine *Posyandus* were purposively selected. The *Posyandus* selected had participants of children under five from households whose profession was as a farmer, and the households of children under five had a home yard. Besides that, the mother of children under five registered in the *Posyandus* were willing to be respondents for interview and willing to follow nutritional extension and to accept the home-gardening program. The households were selected by their willingness to participate in this research for two years. In each *Posyandu* selected, one to four cadres of the *Posyandu* were also involved as participants of this activity. The numbers of the mothers of children under five, children under five (balita), and the cadres by *Posyandu* in each village are displayed in Table 3.1.

Table 3.1 The selected *Posyandus*, number of respondents, and cadres by village

Villages	<i>Posyandus</i>	Mothers	Children under five	Cadres
Sukaesmi	1. Mangga	12	12	2
	2. Pisang	12	12	2
	3. Sawo	2	2	1
	4. Duku	6	6	1
		32	32	6
Sukaluyu	1. Melati 1	8	8	1
	2. Melati 2	19	19	1
	3. Dahlia	4	4	2
		31	31	4
Sukajaya	Harum 1	30	30	4
Sukajadi	Dewi	31	31	4
Total		124	124	18

3.4 Research Procedures

This research was started by collecting baseline data of 124 households of mothers of children under five and 18 cadres selected before the intervention was done. The baseline data was used to get a preliminary information on

the socio-economic characteristics of the households, the condition of home environment, land ownership, nutrition knowledge, attitude to nutrition and nutrition practice of the mothers of children under five, as well as food consumption of the children under five.

The intervention implementation included two main activities, that is, nutrition education and a home-gardening program. Prior to the implementation of this program, the research team socialized the program and conducted a focus group discussion (FGD) to three villages getting the intervention. The socialization included presentation of the purposes and goals of the program in general, the schedule, and the forms of activities that will be performed. The socialization was not only directed to the mothers of children under five and cadres being the research respondents but also to the midwives, leaders of the villages, heads of RTs/RWs (subparts of a village) and the local government (Sub-District of Tamansari). The objectives of the socialization was to describe the programs to be conducted within two years so that the stakeholders were able to support the program accomplishment.

3.4.1 Focus Group Discussion (FGD)

Prior to the intervention of nutrition education, an investigation of information on socio-environmental aspects was done by using a Participatory Rural Appraisal (PRA), diagram Venn and time trends. The PRA administration was done in the Focus Group Discussion (FGD) twice at the office of Sub-District Tamansari. The first FGD participants were the *Posyandu* cadres who became the respondents from the three villages intervention, namely, Sukaresmi, Sukaluyu, and Sukajaya. The second FGD participants were the formal or informal community figures, such as the heads of RT/RW, the village leaders, and the religious leaders as well as stakeholders connected with *Posyandus*, such as *Puskesmas* (Community Health Center).

The objectives of FGD with the *Posyandu* cadres are: 1) to obtain information on the factual *Posyandu* implementation from their perception; 2) to learn from each other, among the participants, and between the researchers and the participants; and 3) to identify the problems, potentials, and needs perceived by the participants concerning with the implementation of the local *Poyandus*. The steps of FGD administration with the cadres at the first session were as follows:

1. The researchers prepared the equipments and materials needed, among others are plano paper, metaplan paper (small sheets of paper) boardmarkers, and celotapes.
2. The researchers described the purpose and goals of FGD and the research in general.
3. The participants were divided into three small groups. Each group was comprised of 4 to 5 cadres representing each cadre's village.
4. The researchers asked one question to the participants. The first question is who are involved in the *Posyandu* activities.
5. The members of the groups discussed in their own group and answer the question by writing the answers on the metaplan papers given; the answers were written briefly.
6. The metaplan papers which had been completed were stuck together on the plano paper. The layout of sticking metaplan papers was based on diagram Venn. The party whose role was more important was stuck closer with the *Posyandu* party; on the other hand, those whose roles were less significant were stuck far from the *Posyandu* party. Next, the participants circled the metaplan papers which the parties involved in the *Posyandu* activities were written on. The parties whose influence was great were given bigger circles, and those whose role was small were circled small.
7. After the process was completed, one of the group members presented the result of their discussion.
8. Discussion on the collected answers were carried out between the participants and the researchers.
9. The researchers assisted the FGD participants to formulate the group answers.

After the first session of FGD had been performed, it was continued with the second session which was intended to investigate the potentials and problems. However, this session was preceded by an icebreaking activity so that the participants were not bored and the FGD situation became more dynamic. The second session employed a time trend technique. The steps were as follows:

1. Similar to the first phase the participants were divided into three small groups.

2. The researchers asked what had happened in the *Posyandus* within the last three years, concerning with: the condition of *Posyandu* places/rooms, facilities and infrastructures, cadres, participation of pregnant mothers and children under five etc.
3. The small groups had a discussion and answered by completing a table on the plano paper which was divided into three year columns in forms of symbols. Then in the columns was drawn a trend line from the data on the columns.
4. A group representative presented their discussion result.
5. A discussion was held among the participants and also between participants and the researchers.
6. The researchers assisted the FGD participants formulate the group answers.
7. FGD was ended with a word of thanks, and the researchers motivated the participants to remain enthusiastic in serving the people well.



Picture 3.1 Focus group discussion among *Posyandu*'s cadres

The second FGD was conducted with the participants of the community figures and other stakeholders connected with *Posyandus*. The main goal of this FGD is obtain information on *Posyandu* problems and improvement efforts from their perspectives. The steps of the FGD implementation with the community figures were as follows:

1. The researchers asked the problems encountered by the *Posyandus*, concerning with facilities and infrastructure, human resources, community participation, government aids, etc.
2. From each of the questions, individual participants answered or expressed his/her ideas.

3. The researchers wrote the participants' answers on the plano paper in front of the participants.
4. Discussion was done for the answers.
5. The researchers asked the next question on the improvement efforts to overcome the problems.
6. The same steps as the previous ones were performed.
7. FGD was ended by a word of thank, and the researchers encouraged the participants to keep on being enthusiastic serving the community well.



Picture 3.2 Focus group discussion among community leaders

When the intervention of nutritional education had been completed, FGD was implemented again in each of the intervention villages with as the participants of the selected cadres and some representatives of the mothers under five who were considered active following the nutritional extension and had high motivation in taking care of plants in their home garden. FGD was conducted to elicit information on the problems that underlied the participation level of the mothers under five to *Posyandus*.

The steps of the FGD implementation were as follows:

1. The researchers prepared the materials and equipment needed.
2. The researchers explained the purposes and objectives of the FGD.
3. The participants were grouped into 3–4. Each of the groups was comprised of 1–2 cadres and 3–4 mothers of children under five.
4. The researchers asked the problems that underlied the participation level of mother under five to *Posyandu*.
5. The participants discussed in the groups, answered the questions, and wrote the answers on the plano paper, the answers were written short.

6. The group representative presented their discussion results.
7. A discussion was performed among the participants, and also with the researchers.
8. FGD was ended by a word of thanks, and the researchers motivated the mother under five to keep on coming to *Posyandu*.

3.4.2 Nutritional Extension

Prior to the intervention of nutritional extension, the materials were developed based on the previous materials for nutritional education, from a study by Khomsan *et al.* (2009) entitled Nutritional Education to Improve Mother and Cadre Nutritional Knowledge and Children Nutritional Status in Indonesia. The materials for the nutritional education were developed in forms of a module for *Posyandu*, presentation through power point, leaflet, poster, banner, and pre and posttest items. The pre-post test result of nutrition knowledge was used in intervention group, while baseline-endline test was used in control group.

The module developed consists of several topics, namely: 1) Basic nutrition; 2) Nutrition for children; 3) Food selection for children under five; 4) Primary sanitation; 5) Food safety; and 6) Vegetable cultivation in home gardens. The module is expected to be able to be used as a handbook for the activities of the nutritional extension by *Posyandu* cadres who became the participants of the action-research program.

The materials in a power point presentation and in a leaflet for the extension were taken from a module. The power point presentation and leaflet were created as attractive as possible, using pictures as well as simple sentences so that they are easy to be understood by the cadres, mothers under five year as the extension participants. The outlines of the power point presentation and leaflet per topic in each meeting are as follows:

1. Basic nutrition: consisting of definition of nutrients, uses, kinds, functions of nutrients, examples of food sources of nutrients, principles of balanced nutritions, three functions of food as well as problems due to over-nutrition and nutrition deficiency (malnutrition).
2. Nutrition for children: explaining exclusive breastmilk, initiation or early breastfeeding, complementary feeding, nutrition for children under five.

3. Food selection for children under five: consisting of methods for shaping a good eating habit, tips for feeding children under five, tips of selecting and serving milk, and tips for selecting good foods for children under five.
4. Basic sanitation: explaining sanitation and personal and environmental hygiene, facilities of healthy homes, garbage management, tips for preventing pollution, and tips for correct and good handwash.
5. Food safety: describing nature of food safety, kinds of chemical, physical and biological contamination, ways of contamination prevention, and safe food additives.
6. Vegetable cultivation in a home garden: describing techniques of planting vegetables in a garden and home garden, techniques of raising seedlings, techniques of fertilizing and making organic fertilizers and liquid fertilizers, techniques of land tillage as well as techniques of pest and disease control.

Posters created in this study consisted of five different themes, that is: MAKE EATING VEGETABLE AND FRUITS AS A HABIT, MAKE EATING EGG AND FISH AS A HABIT, MAKE DRINKING MILK AS A HABIT, DON'T DEFECATE IN ANY PLACES, and USE HOME GARDENS. Banners contain invitation: LET'S GO TO *POSYANDU*, FIVE SERVICE TABLES IN *POSYANDU*, and NAMES OF THE *POSYANDUS* becoming the research participants. The posters and banners were then stuck on the location of the *Posyandu*.

The activities of nutritional extension were held twice a month during three months. Each meeting was held for about 45 to 60 minutes. Topics of the extension follows the contents of the module. The nutritional extension was carried out by the research team accompanied by the officers of agricultural extension, assistants, and two post-graduate students. Prior to every extension a pretest was administered to know the participants' basic knowledge on the nutritional materials which was going to be presented and after the extension a posttest to see the effectiveness of the extension which had been done. The pretest and posttest consisted of ten questions on nutritional knowledge for each topic of the nutritional materials so for the five topics of nutritional materials there were 50 test items. To support the activities of nutritional extension, the cadres, mothers of children under five were given handouts dan leaflets in each of the extension.



Picture 3.3 Nutritional extension

In addition to the nutritional extension, the cadres and mothers of children under five in the three intervention villages were given elucidation on improving the community participation to *Posyandu*. The topics elucidated were concerning with the definition of participation, usefulness and importance of the participation, those involved in the participation, forms of participations, tips for mothers of children under five so that they visited *Posyandu* regularly through the improvement of attention of the *Posyandu* agents. In this elucidation there was no pretest because this was only intended to improve the cadres spirit in holding their tasks as *Posyandu* cadres as well as to encourage mother of children under five so that they were motivated and active bringing their children to *Posyandu* until their children reaches five years old.



Picture 3.4 Cooking demonstration

Another activity complementing the nutritional extension was a cooking demonstration by using abundantly-available local food materials. Types of foods practiced in the cooking demonstration was snacks for children under

five in order that the participant mothers were able to provide wholesome and nutritious snacks by themselves. There were two recipes practiced, namely, cassava croquettes and vegetable chicken nuggets. All of the materials for the cooking demonstration were provided by the researchers, while the cooking utensils were provided by the cadres. The steps of the cooking demonstration were as follows:

1. The team prepared the materials for the cooking demonstration.
2. The cadres assisted to prepare the cooking utensils.
3. The team explained the recipes that were going to be practiced.
4. The chef practiced the way of making cassava croquettes and vegetable chicken nuggets.
5. The chef asked one of the participants as a volunteer to help the chef practice cooking.
6. When the recipes of cassava croquettes and vegetable chicken nuggets had been finished being practiced, the participants of the cooking demonstration were invited to taste them.
7. The cooking demonstration was ended by a word of thanks and a message that the participants should make wholesome and nutritious snacks using local food materials.

3.4.3 Implementation of Home Gardening

The stages of home gardening performed were started by a program socialization, preliminary observation of homeyard utilization, determination of plants types which were going to be raised, program implementation, and program assistance. The stages in details are presented as follows:

1. Program socialization

Program socialization was directed to the cadres and mothers of children under five selected in the three intervention villages. The materials were presented by the research team in cooperation with field officers of agricultural extension (PPL) from Balai Penyuluhan Pertanian Perikanan dan Kehutanan (BP3K)—a center of agricultural, fishery, and forestry extension in Dramaga areas. In the socialization of the home gardening

program was also expressed an expectation that there would be a willingness and cooperation from the cadres and mothers of children under five to be involved during the implementation of the home gardening program.

2. Preliminary observation on the homeyard utilization

A preliminary observation was carried out to identify the homeyard width, interests in types of plants which would be planted, facilities or infrastructure required and the utilization forms of homeyards owned by the respondents.

3. Determination of types of plants

Plants to be planted in this program were various, such as small-sized chilly, red chilly, tomato, spinach, *kangkung* (a kind of green leaf vegetable), eggplant, *pakcoy* (a kind of small-sized green leaf cabbage), *caisin* (a kind of green leaf vegetable), *katuk* (a kind of green leaf vegetable), string beans, and beans. The plants that must be planted were red chilli, small-sized chilli, tomato, *kangkung*, and spinach, while other optional ones are according to the ability to look after the plants and the width of the homeyards owned by the participants. Small-sized chilly, red chilly and tomato were selected to the compulsory plants because they represented spicy plants which must be needed by the housewives for cooking, while *kangkung* and spinach represented vegetable plants which are easy to look after and able to fulfill the household nutritional need.

Program implementation

a. Deciding demplots for each selected village

The purpose of demplot making was as a place for models of the plant cultivation practice for the participants of the program. The number of demplots was three per village and accordingly there were nine model areas, whose locations were in one of the program participants which was agreed and based on the consideration of easy access for the participants.

b. Practice of nursery making

Nursery making was performed in each demplot location. The equipments used were trays (a nursery plastic tray with 128 planting

holes) and ten trays per location, and paranets to shade the nursery areas. Media which were used were burnt husk and bokashi while types of plants germinated were all except spinach, string bean, and beans because their seeds were directly planted in the land.

The stages in nursery activities were as follows:

- Spread a sack or tarpauline as the base of planting media.
- Mix burnt husk and bokashi with a ratio of 1 : 1, and mix well.
- Prepare a tray and fill with the mixture, then press so that each tray hole is solid enough.
- Make a hole on the solid media with a finger, place one seed in each tray hole, except for caisin and pakcoy trees, it can be 2 seeds per hole.
- After all of the holes are filled with seeds, cover the hole surface thin with media.
- Label the tray with the name of the plant types being germinated and the germinating date.
- Water the filled tray with a watering can directed back and forth quickly so that the seeds do not come out of the holes (watering is done once a day for the next).
- Place and arrange the tray in the nursery place.

The nursery place had been prepared in advance, that is, the top was covered with paranet to reduce sunlight intensity or heavy rain. Around the nursery place were built bamboo fences and paranet to prevent chickens from destroying the germinated seeds.



Explanation of nursery procedures



Preparing a tray and fill with the solid media



Filling the tray with seeds



Preparation of nursery



Seedlings in the nursery

Picture 3.5 Preparing nursery for home garden

c. Planting preparation

Planting preparation included making verticulture racks to plants in narrow areas, making fences, tilling land, practicing to make a liquid fertilizer, distributing bokashi fertilizers and polybags, as well as distributing seedlings from the demplot areas.

- Making verticulture racks

In the home gardening activities, the participants were introduced with five models of verticulture for each of the villages using a paralon, gutter as well as andong bamboo (big bamboo) as the main materials, in the hope that this would inspire the participants to apply it according to their home/surrounding condition. The models of verticultur media were distributed to the cadres as models to be applied in narrow homeyards. The verticulture media production was carried out in each participants' home, which was helped by their husbands or children.

- Making fences of the home garden

Similar to making verticulture racks, making fences was done by the husbands or parents of the program participants. For the husbands working as farmers, they could help anytime when all of the materials were available, but for their husband working as shoe-sandal makers, they were able to help on Saturday and Monday because on those days they had spare time.

- Tilling the home garden land

The tillage of the home garden land was done by the participants helped by their household members. They tilled the land after finishing their household chores. The land was cleared, then dug up and made into seedbeds. The land was then spread by compost and bokashi fertilizers.

- Distributing seedlings

Seedlings were taken care by the respondents selected by the PPL. The seedlings were watered once a day if the day was hot and bright or according to the weather. The nursery length depends on the type of plants. If the plants have produced leaves, watering are with a leaf fertilizer (Gandasil D) twice a week. The seedlings are ready to be distributed to the respondents the seedlings are 4–6 weeks old after being germinated.



Models of verticulture



Introducing verticulture

Bamboo andong for making
verticulture racks

Activities of nursery

Picture 3.6 Preparing verticulture for home garden



Picture 3.7 The use of bamboo for fences

- Distributing *polybag*

Polybags were used as planting media in narrow areas. The number of *polybags* per respondents was 10 (five in 50 x 50 cm and the other 5 in 30 x 35 cm). The plants in polybags are usually placed in left and right terraces or in parts of the house which does not have any land for verticulture.

- Distributing bokashi fertilizer

The procurement of bokashi fertilizer was done in two stages, where the first stage was for the nursery practice and polybag filler. The second stage was used for the demplot areas and the respondents' areas which were relatively wide. The use of organic fertilizer for the home-garden area was very necessary in regard with the safety of food consumed. Therefore, during the assistance it was always stated to try to add compost independently from the environment.

- Practice of making a liquid fertilizer

Practice of making a liquid fertilizer was performed while waiting for the seedlings grew in the nursery. The practice was carried out in one of the demplot areas and then in the next week it was practiced in each of the other demplot areas so there were available nine barrels of liquid fertilizer. The aim of making the liquid fertilizer was an endeavour to fulfill plant nutrition by utilizing the local resources safe for food consumption. The equipments and materials needed were a 60 liter barrel having a cover, a small hose, compost, biotribe or microbe, and molasses (boiled palm sugar liquid). The procedures were: 5 kg of mature compost, 6 bottle lids of biotribe or microbe, boiled palm sugar liquid after chilled (0.5 kg of sugar boiled in one liter of water) were put into the barrel, and after that the barrel was filled with well water until it was full and its contents were mixed well. The a small hole was made on the barrel and the hose was inserted as a ventilator so that the methane gas could come out. The barrel was left for two weeks in a shady area (not affected by the sunlight nor the rain). After that the water could be used as liquid fertilizer which could be utilized by all of the participants to fertilize the plants.

- Planting

Planting in home gardens was done after the land tillage and fence making/verticulture rack making were ready.



Picture 3.8 Preparing liquid fertilizer

4. Assistance and monitoring home-gardening plants

Assistance and monitoring the home gardening program in the intervention villages were done together between the research team and the extension officers from BP3K (Balai Penyuluhan Pertanian Perikanan dan Kehutanan—a centre of agricultural, fishery and forestry elucidation) in Dramaga, Kabupaten Bogor (a district). Assistance and monitoring which were performed were in forms of providing facilities and infrastructure for the program, cultivation technology presentation, visits to the respondents' home gardens/areas once a month.



Picture 3.9 Monitoring home garden

3.4.4 Workshop of *Posyandu* Management and Cadre Training

To complement the series of this research activities, the research team held a workshop of *Posyandu* management and a cadre training. The workshop was held in the office of Kecamatan Tamansari, which was intended to provide information on *Posyandu* management, the problems and their solution to the cadres, midwives, staff of PLKB (officers of the Indonesian family planing institution) of the subdistricts and the representative of *Puskesmas*. The speakers giving the material of workshop, in addition to the research tim, were those from *Puskesmas* and Health Department. The research tim presented a material about improving the people participation to *Posyandu*, from *Puskesmas* on evaluation standard of *Posyandu* and review of a *Posyandu* information system book (SIP) or it is well-known as a *Posyandu* register book. The last material presenter was from Health Department of Kabupaten Bogor, who presented a theme on *Posyandu* revitalization.

Next, the research team invited all of the cadres to follow a *Posyandu* cadre training held at the Dramaga campus of IPB (Bogor Agricultural University). The facilitators/expert speakers invited were an officer of PLKB from the office of Kecamatan Tamansari. The material presented were recording management of *Posyandu* administration (completing SIP books), and technical solutions for problems in *Posyandu*. After following the training, the cadres getting a set of SIP books, which were divided into six formats, namely:

- Format 1: Records of pregnant mothers, birth, infant mortality, and maternal mortality (pregnant, delivery/parturition)
- Format 2: Register of infants in the *Posyandu* work area (within one year)
- Format 3: Register of children under five in the *Posyandu* work area (within one year)
- Format 4: Register of WUS-PUS (childbearing-aged women/men) in the *Posyandu* work area (within a year)
- Format 5: Register of pregnant mothers in the *Posyandu* work area (within a year)
- Format 6: Data of the number of visitors/*Posyandu* workers/number of infant birth/mortality
- Format 7: Data of the results of *Posyandu* activities



Picture 3.10 Workshop of *Posyandu* management

3.5 Kinds and Methods of Data Collection

The data collected were primary and secondary ones. The primary data consisted of household socio-economic data including job, education, income, number of household members; characteristics of children under five covering sex, age, body weight, body height, health status; house condition; knowledge, attitude and nutrition practice of mothers/cadres; child eating habit; food consumption of the households; land ownership; kinds of planted crops, fish and cattles raised; socio-environmental condition; facility and infrastructure. The primary data were collected through an interview and questionnaire. The secondary data collect were village monographs obtained from the village offices. In details the kinds and methods of data measurement can be seen in Table 3.2.

Table 3.2 Methods of measurement and methods of data collection

Aspects	Variables	Methods of Measurement	Methods of Collection	Baseline Data	Endline Data
Socio-economic characteristics of the households	- Parents' job	- Recording	Interview using questionnaire	√	-
	- Parents' education	- Recording (year following education)		√	-
	- Household income	- Recording (Income per capita)		√	√
	- Number of household members	- Recording		√	√
Land ownership, kinds of crop planted and kinds and number of cartles and fish	Ownership: - home garden - rice field - fishpond - garden - others - types & number of crops - kinds and number of animals and fish.	Recording	Interview using questionnaire	√	√
	Area width (m ²)				
Characteristics of children	- Age	- Year recording	Interview using questionnaire	√	√
	- Sex	- Recording (male, female)		√	-
	- Weight (kg)	- Using a scale with the smallest scale of 0.1 Kg		√	√
	- Height (cm)	- Using microtoa		√	√

Table 3.2 Methods of measurement and methods of data collection (cont.)

Aspects	Variables	Methods of Measurement	Methods of Collection	Baseline Data	Endline Data
	- Health	The illness history in the last one month: - Kinds of illness - Length of illness - Frequency of illness			
Mothers and cadres' nutritional knowledge	- Basic nutrition and nutrition for children under five	Recording	Pre and Post test	✓	-
	- Food safety				
	- Foods for children under five				
	- Basic sanitation and hygiene				
Mothers and cadres' attitude and nutrition practice	- Basic nutrition and nutrition for children under five	Recording	Interview using questionnaire	✓	✓
	- Food safety				
	- Foods for children under five				
	- Basic sanitation and hygiene				
Eating habit of children under five	- Food safety	Recording	Food frequency questionnaire	✓	✓
	- Wholesome foods for children under five				
	- Basic sanitation and hygiene				
	- Food habit and snacking				

Table 3.2 Methods of measurement and methods of data collection (cont.)

Aspects	Variables	Methods of Measurement	Methods of Collection	Baseline Data	Endline Data
	- Food preference				
Food consumption of the household's	Kinds and quantity of foods	Recording	Recall 1x 24 hours	√	√
Participation	- Frequency of mothers and cadres' visits to <i>Posyandu</i>	Recording	Interview using questionnaire	√	√
	- Mothers and cadres' motivation to visit <i>Posyandu</i>			√	-
	- Forms of mothers and cadres' participation in running the <i>Posyandu</i> (planning, implementation, evaluation)			√	√
	- Mothers and cadres' perception towards <i>Posyandu</i>			√	-
Condition of home environment	Physical home environment: - Type of floor - Type of wall - Type of roof - Possession of toilet - Possession of place for defecating - Possession of bathroom - Place for throwing rubbish Drinking water sources	Recording	Interview using questionnaire	√	√

Table 3.2 Methods of measurement and methods of data collection (cont.)

Aspects	Variables	Methods of Measurement	Methods of Collection	Baseline Data	Endline Data
Food availability in the research area	Potentials, kinds, and number of foods	Recording	Secondary data	✓	-
Social environment	- Leadership of the local community in activating the <i>Posyandu</i>	PRA	- Semi-structured interview, focus group discussion using diagram venn, a list of open questions	✓	-
	- Local social organization (Studying Al Qur'an, regular social gathering, etc.)			✓	-
	- Health Programs available			✓	-
	- Facility and infrastructure of <i>Posyandu</i>		- Semi-structured interview, observation, trend timeline	✓	-
	- Problems of malnutrition		- Semi-structured interview, focus group discussion, trend timeline	✓	-

The data collection in the fields were performed by some enumerators. The enumerators in this study were the nutritional graduates of Human Ecology Faculty, IPB, which had been trained before they collected the data. The training materials given to the enumerators covered: the purpose and scope of the study, explanation for the questionnaire, sampling, and interview. Before it was used, the questionnaire was tried out and then was revised according to the result of the try-out.

3.6 Data Analyses

The data collected at the preliminary stage (baseline) were processed and analyzed to get early information on the household socio-economy, home condition, nutritional status and health of children under five; knowledge, attitude and nutritional practice of mothers/cadres; food consumptions of children under five, and land ownership. The results of the preliminary data analyses were used as consideration bases of intervention.

The data analyses of the baseline and endline included parameter estimation, that is, mean, standard deviation, for the quantitative variables as well as the proportion for the categorical variables, and quantitative variable which were able to be categorized. The hypothesis tests were done by t-student for two dependent populations and two independent populations. The two dependent population meant were the same households which were observed before intervention and at the end of intervention. On the other hand, two independent populations were population obtaining the intervention (three villages) and the population which did not obtain any intervention. Then, the results of the analyses were displayed in one and two-direction table as well as in forms of diagrams.

4

Description of the Study Site

4.1 Geography

Kabupaten Bogor (a regency) is one of the areas borders on the capital of the Republic of Indonesia and geographically it is approximately 2,301.95 km² located between 6.19°–6.49° south latitude and 106°1'–107°103' east longitude. The borders of this area are on the north side of Depok City, on the west side of Kabupaten Lebak, on the southwest side of Kabupaten Tangerang, on the east side of Kabupaten Purwakarta, the northeast of Kabupaten Bekasi, on the east side Kabupaten Sukabumi, and on the southeast side of Kabupaten Cianjur.

Kabupaten Bogor was comprised of 40 *kecamatan*s (subdistricts), 430 villages, 3,882 RW (a smaller unit of a village) and 15,561 RT (the smallest unit of a village). Of those number, the majority of the villages, that is, 235 villages, were on the altitude of less than 500 meters from the sea surface, and the rest, 50 villages, were on the altitude of more than 700 meters of the sea surface.

4.2 Governmental Matters

Kabupaten Bogor is a second-level region led by a *bupati* (a kind of mayor) and consists of 36 departments. In this *kabupaten* there were 353 (82%) *swakarya* villages, 77 (19%) *swasembada* villages, and no more villages belonging to the *swadaya* ones.

Based on the regional classification, viewed from its business-field potential, population density, and social aspects, there were 96 villages categorized as urban villages and 334 villages as rural ones. This can be seen from the

condition of the community economy which still relied on the agricultural sectors very much.

4.3 Socio-Population Affairs

As one of regencies which borders on the capital city of Indonesia, Kabupaten Bogor is a main crossing region to DKI Jakarta. The urgent development problem which often becomes a burden in the development process recently was the number of population which is great enough. Based on the data from the Department of Population Affairs, Civil Registration and Family Planning in 2011, the number of population in Kabupaten Bogor was as many as 4,352,591 millions. The number occupied an area of 2,997.13 km² wide, so on average the population density of Bogor was 1,454 people per km².

The great number of population will results in certain implications, especially toward its distribution and density. In 2011 the subdistricts (*kecamatan*) which had a population density over 2,000 people/km² were as many as 20 subdistricts, namely: Leuwisadeng, Cibungbulang, Ciampea, Tenjolaya, Dramaga, Ciomas, Tamansari, Cijeruk, Cigombong, Ciawi, Megamendung, Sukaraja, Cileungsi, Gunung Putri, Citeureup, Cibinong, Bojong Gede, Tajur Halang, Rancabungur, and Ciseeng.

On the educational sector, in 2011 the number of state elementary schools/religious elementary schools was 1,549 and the number of the teachers was 15,471, the number of private elementary schools/religious elementary schools was 732 and the number of the teachers was 6,788. The number of the state junior high schools/religious junior high schools was 144 and the number of teachers was 2,487, the private junior high schools/religious junior high schools 708 and the teachers 5,833. Whereas, the number of private junior high schools/religious junior high schools/vocational junior high schools 418 and the number of the teachers was 3,076. There also significant numbers of senior high schools and 5 universities. A better quality of education will certainly determine the success of Kabupaten Bogor.

The improvement of the community health level can be done through the providing of health facilities which are reachable and affordable to most of the people. In 2011 in Kabupaten Bogor were available four state hospitals, five special hospitals, and four private hospitals. Whereas, the number of *puskemas*

was 101 *puskesmas*, the extended *puskesmas* 101, and mobile *puskesmas* 23. The facilities were supported by 201 general practitioners, 70 dentists, 454 nurses and 762 midwives, as well as 258 midwives performing a private practice. The doctors opening a private practice in Kabupaten Bogor were very many, that is, 1,044 general practitioners, 225 dentists, and 164 specialists. The availability of adequate health facilities must be supported by a good service so that the community can utilize the facilities and the results are satisfactory.

An effort to build the household prosperity through a birth planning is an endeavour of the family planning program. The endeavour is attained through the establishment of family planning clinics to serve the community. In 2011 there were 132 family planning clinics throughout the 40 subdistricts. In 2011 the attainment of the active family planning participants in Kabupaten Bogor reached 91.57% for hormonal methods (injection, pills, and implanted) and 8.43% for nonhormonal methods (IUD, MOP, MOW, and condom). Whereas, the prevalence level (the ratio between the active family planning participants and the realization of childbearing men) was 73.66% on average.

Provision of a praying place for religion followers is a communication medium between the human beings and the creator in improving their faith degree. In 2011 there were as many as 5,041 mosques, 8,512 praying houses, 50 protestant churches, 15 catholic churches, 9 temples, and 21 Buddhist monasteries. The number of the peoples classified by religion is as follows: 3,848,199 peoples were moslems, 33,419 protestant christians, 29,351 catholics, 9,834 hindus, and 12,011 budhists.

4.4 Agriculture

Agricultural sectors cover crops, fishery, plantation, farming, and forestry. Agricultural sectors in Kabupaten Bogor hold a very important role, considering the width of the agricultural areas owned and also most of the villages in Bogor was still categorized as rural areas.

The width of the area used for wet ricefields in 2011 was as wide as 48,185 ha. The rice production of the wet ricefields in 2011 was as much as 519,676 tons and of the dry ricefields was 7,092 tons. The high rice productivity can be used as a bumper of food stamina in Bogor regency.

The fish production of the ricefield-water fishponds in 2011 was 201.65 tons, of quiet-water fishponds 50,277.34 tons, of running-water fishponds 5,561.75 tons, of in-stream baskets 37.14 tons. The farming in Bogor Regency had a very important role in the food provision. The production of meat (cows, buffalos, goats, sheep, chickens, and ducks) in 2011 was 100,146,282 kgs, of milk 11,198,708 liters, and of eggs (chicken and duck) 42,830,167 eggs.

5

Socio-Economic and Demographic Characteristics of Households

5.1 Socio-Demographic Characteristics of the Households

On average the number of the household members, either in the control village or in the intervention villages, was five, and the average number of children was about two to three. This shows that there is an increasing awareness of the rural community towards the Family Planning program that recommends people that having two children is better.

Several factors affecting the prosperity level according to the BKKBN/ National indicators (Pre-prosperous Households—Pra KS—up to Prosperous Households—KS III Plus) are age and husband or wife's education. A study on factors affecting household prosperity conducted by Iskandar *et al.* (2006) found out that the younger-aged husbands had a greater chance for prosperity than the older-aged husbands. In contrast, the older-aged wives had a greater chance for prosperity than the younger-aged wives. In addition, the high education level of the husbands and wives had a greater opportunity for prosperity compared to those having a lower education level.

The husbands in the intervention villages were on average older (33 years) than those in the control village (29 years). The condition also happened to the wives' ages which were older (27 years) in the intervention villages compared to those in the control village (24 years). Education is an important

aspect to improve the community life prosperity. Education may open an opportunity for individuals or community to develop themselves and realize it. Therefore, the low education level may decrease the level of the community life prosperity. The education attained by the husbands and wives in the control village was higher (equal to class 1 of junior high school) compared to the education of the husbands and wives in the intervention villages (equal to class 5 of elementary school).

According to WHO (2004), the body mass index (BMI) of the mothers, either in the control village or in the intervention villages, was categorized normal, that is, 22.5 kg/m² with the average mother body weight of 51 kg, and the average mother body height of 151 cm. The data in details can be seen in Table 5.1.

Table 5.1 Characteristics of the household socio-demography

Characteristics	Control	Intervention	Total
Number of household members (person)	4.8 ± 1.7 ^a	5.0 ± 2.2 ^a	4.9 ± 2.1
Age (year)			
- Husband	29.0 ± 4.3 ^a	33.1 ± 8.7 ^b	32.1 ± 8.1
- Wife	24.5 ± 3.9 ^a	27.4 ± 7.5 ^b	26.7 ± 6.9
Education (year)			
- Husband	6.8 ± 3.0 ^a	5.3 ± 2.1 ^b	5.6 ± 2.5
- Wife	6.6 ± 2.3 ^a	4.8 ± 1.8 ^b	5.3 ± 2.1
Mother Anthropometry			
- Body weight (kg)	50.4 ± 9.9 ^a	51.8 ± 9.5 ^a	51.4 ± 10.1
- Body height (cm)	151.4 ± 7.5 ^a	150.5 ± 5.2 ^a	150.7 ± 5.9
- BMI (kg/m ²)	22.1 ± 4.7 ^a	22.8 ± 3.6 ^a	22.7 ± 4.1

The different letters in the same row show a significant difference ($p < 0.05$) by t-test.

5.2 Household Incomes and Expenditures

According to BPS (2008), the World Bank requires an absolute poverty line to compare the poverty figures among countries. This is useful to determine where the available financial funds are directed to, and also to analyze the progress and to combat poverty. In general there are two standards used by the World Bank, that is: a) US \$1 per capita per day, where it is estimated that there are approximately 1.2 billions of the world population who live under the standard; b) US \$2 per capita per day, where more than two billions of the people who live less than the standard. The US dollar used was US \$ PPP (Purchasing Power Parity), not the legal exchange rate. Both of the lines were

an absolute poverty line. The people whose incomes were under the poverty line were classified as poor people.

The average household income in the control village was twice higher than that in the intervention villages, that is, IDR524,808 (the control village) and IDR256,720 (the intervention villages). If compared to the poverty line according to the world Bank (\$1–\$2 per capita per day or IDR276,000–IDR552,000 per capita per month), the average household income in the intervention villages was still under the poverty line while the average household income in the control village was around the poverty line according to the World Bank. However, if compared to the result of a study conducted by Khomsan *et al.* (2011) on the poverty indicator of the community and misclassification of poor people according to the criteria by BPS (the Indonesian Statistic House), the World Bank, and Sajogyo, the average household incomes, either in the control village or in the intervention villages were below the poverty line because from the research result it was found that the gold standard of the poverty line for Kabupaten Bogor was as much as IDR544,019/capita/month.

On average the expenditure allocation in the control village was used more on the nonfood needs (51.3%) than on the food needs (48.7%), and the average of the total expenditure was lower than of the total income. On the other hand, the average expenditure allocation in the intervention villages was used more on the food necessities (61.3%) than on the nonfood necessities (38.7%), and the average total expenditure was higher than the total income. This reveals that the prosperity level of the people in the intervention villages was lower than that of the people in the control group. The detail data can be seen in Table 5.2.

Table 5.2 Statistics of household income and expenditure (IDR/cap/month)

Statistics	Control	Intervention	Total
Income (IDR/cap/month)	524,808 ± 594,217 ^a	256,720 ± 148,355 ^b	323,740 ± 340,835
Expenditure (IDR/cap/month)			
- Food	211,560 ± 109,712 ^a	205,240 ± 70,902 ^a	206,820 ± 81,875
- Nonfood	308,200 ± 325,931 ^a	138,880 ± 78,928 ^b	181,210 ± 189,708
- Total Expenditure	519,763 ± 359,422 ^a	344,120 ± 124,000 ^b	388,030 ± 220,999
Expenditure Ratio (%)			
- Food	48.7 ± 17.4 ^a	61.3 ± 11.3 ^b	58.1 ± 14.1
- Nonfood	51.3 ± 17.4 ^a	38.7 ± 11.3 ^b	41.9 ± 14.1

The different letters in the same row shows a significant difference ($p < 0.05$) by t-test

On average the food expenditure allocation in the control village and in the intervention ones was mainly used to meet the needs for rice, side dishes, and streetfoods. The great amount of the expenditure allocation for streetfoods showed that streetfoods nowadays have become one of the main needs, except rice, for the people in the control and intervention villages. As we know, nowadays there are very many streetfoods which use dangerous additives that may disturb one's health. According to Sugiyatmi (2006), based on a survey by *Street food Project* (1989) in Jakarta, Bogor, Rangkasbitung, and in small cities, such as Cibadak, Rengasdeklok, Pacet, and Cikampek in fact there were many streetfood sellers who used synthetic-colour additives into their merchandise, especially drinks. In addition, the nutrition value of streetfoods was lower than of the complete foods so they cannot meet the daily nutrient needs well. The expenditure allocation to meet the needs for fruits and vegetables was relatively low. Besides that, the expenditure allocation for milk was also relatively low because milk for Indonesian people was still considered a luxurious commodity even though mothers have understand well the importance of milk for it can strengthen the bones and teeth. The complete data are displayed in Table 5.3.

Table 5.3 Statistics of household food expenditure (IDR/cap/month)

Food	Control		Intervention		Total	
	Amount	%	Amount	%	Amount	%
Rice	54,002 ± 48,174	12.7	6,427 ± 18,105	19.6	58,821 ± 28,859	17.8
Side dishes	44,682 ± 29,171	9.7	34,139 ± 21,366	10.1	36,775 ± 23,882	10.0
Vegetables	20,399 ± 11,048	4.9	19,391 ± 17,603	5.5	19,643 ± 16,193	5.4
Fruits	10,051 ± 11,582	2.3	6,482 ± 11,421	1.6	7,374 ± 11,554	1.8
Frying oil	8,934 ± 4,312	2.5	10,510 ± 6,453	3.1	10,116 ± 6,126	3.0
Drinks	10,832 ± 8,415	2.4	10,337 ± 7,317	3.0	10,461 ± 7,648	2.9
Street foods	42,374 ± 33,942	9.8	43,871 ± 28,831	12.7	43,497 ± 30,735	11.9
Milk	8,731 ± 18,270	1.5	6,007 ± 16,201	1.5	6,688 ± 16,757	1.5
Others	11,558 ± 7,824	2.9	14,077 ± 9,297	4.2	13,448 ± 9,084	3.9

The average nonfood expenditure in the control and intervention villages was mainly used to meet the needs for cigarettes and miscellaneous needs (transportation, material contribution, tax, credit, and cellphone pulses). The low allocation for child education showed that the awareness of the people on the importance of education was still minimum in the control and intervention villages. That can be seen from the low education level of the husbands

and wives both in the control village and in the intervention ones which were equal to junior high school grade 1. Based on the Information of the Regional Government Implementation (*Informasi Laporan Penyelenggaraan Pemerintahan Daerah-ILPPD*) of Kabupaten Bogor, West Java in 2012, one of the macro-performance indicators of the development in Kabupaten Bogor in 2012 was the average study length of the people in Kabupaten Bogor up to 8.12 years. This condition showed that the people of Kabupaten Bogor who were 15 years old or more on average had been able to join an education level which was equal to Junior High school of grade 2. It means the people of Kabupaten Bogor has not accomplished the nine year obligatory learning program.

The high cigarette expenditure showed that the community awareness of the importance of health was still very low in the control and intervention villages. According to WHO (2008), the prohibition of tobacco advertisement, increase in the tobacco product price, and a law which prohibits smoking in public places can reduce the number of people who begin to use tobacco product and reduce the number of tobacco use by smokers as well as increase the number of the youth who stop smoking. Therefore, the Indonesian government, especially Kabupaten Bogor must revise and reinforce the regulation or law on the cigarette prohibition. The expenditure allocation on the fuel need fulfillment, particularly gas, was relatively low. This was due to the fact that most of the people, either in the control and intervention villages preferred buying processed food to cooking the food they were going to eat by themselves because it was saving energy and time. The data in details can be seen in Table 5.4.

Table 5.4 Statistics of household nonfood expenditure (IDR/cap/month)

Non-Food	Control		Intervention		Total	
	Amount	%	Amount	%	Amount	%
Health	15,539 ± 18,280	3.7	16,121 ± 32,464	4.3	15,975 ± 29,914	4.1
Child Education	2,628 ± 5,299	0.8	5,289 ± 9,926	1.8	4,624 ± 9,068	1.5
Clothes and footwear	15,890 ± 23,194	3.1	12,216 ± 7,370	3.6	13,135 ± 13,330	3.5
Electricity	14,730 ± 14,435	3.2	13,481 ± 14,848	4.0	13,793 ± 14,756	3.8
Fuel	8,278 ± 7,521	2.1	9,176 ± 6,339	2.7	8,952 ± 6,712	2.5
Cigarette	47,439 ± 38,608	10.5	39,049 ± 33,666	11.1	41,147 ± 35,083	10.9
Others	203,696 ± 317,452	27.9	43,543 ± 52,879	11.3	83,582 ± 177,854	15.5

According to the Information of the Regional Government Implementation (*Informasi Laporan Penyelenggaraan Pemerintahan Daerah-ILPPD*) of Bogor Regency, West Java Province in 2012, one of the performance indicators of the Bogor-Regency macro-development in 2012 is the number of literate people in Bogor Regency which was based on the BPS estimation in 2012, it has been realized as much as 95.26%. Based on the data, it is known that there was about 5% of the Bogor Regency population who were still illiterate. In this study, all of the husbands and wives in the control village were able to read and write compared to the intervention villages. This is because the education levels of the husbands and wives in the intervention villages were lower than that of the the control village. Accordingly, it is expected that a nutritional elucidation given to them are able to increase the awareness of the people in the intervention villages on the importance of reading and writing ability to improve their knowledge so they are able to improve their life prosperity. The data in details can be seen in Table 5.5.

Table 5.5 Distribution of literate husbands and wives

Ability	Control		Intervention		Total	
	n	%	n	%	n	%
Reading						
- Husbands	31	100.0	93	97.9	123	99.2
- Wives	31	100.0	90	93.8	120	96.8
Writing						
- Husbands	31	100.0	93	97.9	123	99.2
- Wives	31	100.0	89	91.8	119	96.0

Even though the research sites belonged to rural areas, only a few husbands and wives who worked as farmers. The majority of the husbands in the control village worked as nonfarm laborers (35.5%), then followed those working in a service sector, such as passenger deliverers (using a motorbike), barbers, and tailors as many as 29.0%, and the rest worked in other sectors. The majority of the mothers in the control village did not work or were as housewives (87.1%), a few others worked as sellers and in a service sector.

Most of the husbands in the control and intervention villages had a job as nonfarm laborers. Their income as laborers was relatively not constant because it depended on the numbers of days one worked. With an income which is unlikely to be constant, one will prioritize his/her income to fulfill his/her primary needs first, namely, food (Khomsan *et al.* 2009).

The majority of the husbands in the intervention villages worked as nonfarm laborers (69.1%) and a few worked as farm laborers (11.7%), farmers (8.5%), and sellers (7.4%). Almost all of the wives in the intervention villages were housewives, that is, 89.4%, the rest worked as farmers, sellers, laborers, and service providers. Some of the husbands and wives' occupation can be seen in Table 5.6.

Table 5.6 Distribution of husband's and wife's occupations

Occupations	Control		Intervention		Total	
	n	%	n	%	n	%
Husband's occupations						
- Farmer	1	3.2	8	8.5	9	7.3
- Seller	2	6.5	7	7.4	9	7.3
- Farm laborer	3	9.7	11	11.7	14	11.3
- Nonfarm laborer	11	35.5	65	69.1	75	60.5
- Government worker	0	0.0	1	1.1	1	0.8
- Service provider	9	29.0	1	1.1	10	8.1
- Others	5	16.1	1	1.1	6	4.8
Wife's occupations						
- Farmer	0	0.0	2	2.1	2	1.6
- Seller	3	9.7	5	5.3	8	6.5
- Farm laborer	0	0.0	1	1.1	1	0.8
- Nonfarm laborer	0	0.0	1	1.1	1	0.8
- Government worker	0	0.0	0	0.0	0	0.0
- Service provider	1	3.2	1	1.0	2	1.6
- Housewife	27	87.1	84	89.4	110	88.7
- Others	0	0.0	0	0.0	0	0.0

Table 5.7 shows that 54.8% of the mothers of children under five in the control village still stayed with their parents and the rest, 45.2%, had their own houses. On the other hand, in the intervention villages, many of the mothers of children under five had their own houses (62.8%), and the rest still stayed with their parents.

Because the types of the houses owned by almost all of the mothers of children under five were permanent (90.3% in the control village and 88.3% in the intervention villages) automatically 93.5% of the house walls in the control village and 92.6% in the intervention ones were cemented wall. Using cemented walls as the main house walls is in line with the policy of housing development in Indonesia which is explicitly stated in *Keputusan Menteri Permukiman dan*

Prasarana Wilayah No. 403/KPTS/M/2002 (A housing ministerial decision) on Technical Guidelines of the Simple Healthy House Development, based on the potentials of building materials, cultural potentials, and geological condition, a house type as an alternative which is recommended to the area of West Java is cemented house wall.

Table 5.7 Distribution of houses by their status and characteristics

House condition	Control		Intervention		Total	
	n	%	n	%	n	%
House status						
- Self-owned	14	45.2	59	62.8	73	58.9
- Parent-owned	17	54.8	33	35.1	50	40.3
- Others	0	0.0	2	2.1	1	0.8
House types						
- Woven bamboo screen	2	6.5	6	6.4	7	5.6
- Half cement wall	1	3.2	5	5.3	6	4.8
- Permanent	28	90.3	83	88.3	111	89.5
House wall						
- Bamboo	2	6.5	6	7.4	8	6.4
- Cemented wall	29	93.5	88	92.6	117	93.6
House Floor						
- Soil	0	0.0	4	4.3	4	3.2
- Cement	3	9.7	43	45.7	46	37.1
- Floortile	6	19.4	9	9.6	15	12.1
- Ceramic tile	20	64.5	34	36.2	54	43.5
- Wooden board	2	6.5	4	4.3	5	4.0
House roof						
- Asbestos	1	3.2	8	8.5	9	7.3
- Roof-tile	30	96.8	85	90.4	114	91.9
- Iron sheet	0	0.0	1	1.1	1	0.8
House width (m ²)	74.7 ± 56.5		59.9 ± 47.3		63.6 ± 49.9	

The kinds of floor which were commonly applied in the house building, were ceramic tiles, 64.5% in the control village and 36.2% in the intervention ones, cement floor (9.7% in the control village, and 45.7% in the intervention ones), and floortiles (19.4% in the control village and 9.6% in the intervention ones. However, there were still some houses whose floor was soil and boards. This showed that not all of the parts of the houses were in ceramic tiles or cement.

Whereas, according to Sanropie (1989) soil house floor should not be used anymore because the house tends to be damp in the rainy season so this may raise problems diseases to its residents.

Most of the types of house roofs belonging to the mothers of children under five in the control village (96.8%) and in the intervention ones (90.4%) used rooftiles and only a few used asbestos sheets. The average width of the houses in the intervention villages were small (59.9 m²) compared to that of the houses in the control one (74.7 m²).

All of the households in the control village had used electricity as a lighting sources, while in the intervention ones there were still 2.4% of the households using kerosene lamps. It was assumed because the electricity tariff was unaffordable to a small portion of the household in the intervention villages. In addition, 87.1% of the households in the control village had followed the government policy on the conversion of kerosene to gas. However, in the intervention villages there were still many enough households (31.9%) using firewoods as a fuel source. This was due to an easy access to firewoods and the costly price of kerosene as well as the fact some of the people were worried for incidents of the gas tube exposition and the people were unfamiliar on how to use a gas tube (Tabel 5.8).

Table 5.8 Distribution of household lighting and fuel

House Condition	Control		Intervention		Total	
	n	%	n	%	n	%
Types of lighting						
- Electricity	31	100.0	91	96.8	121	97.6
- Kerosene lamp	0	0.0	3	3.2	3	2.4
Fuel sources						
- Kerosene	0	0.0	6	6.4	6	4.8
- Gas	27	87.1	58	61.7	84	67.7
- Firewood	4	12.9	30	31.9	34	27.4

Most of the households in the control village or in the intervention ones utilized springs for personal cleanliness (bathing, washing, and toilet) and drink. This was because the research sites were close to mountainous areas so there were still many springs encountered. Therefore, the government-supplied water was not commonly used as a water source of bathing, washing,

and toilet, only 9.7% of the households in the control village and 4.3% of the households in the intervention ones which utilized the government-supplied water as a water source for bathing, washing and toilet as well as drinking. However, there were also still many households in the control and intervention villages which utilized well water as a water source for bathing, washing, and toilet. However, only in the intervention villages the households also used well water (24.5%) as a drinking water source and using river water as a water source for bathing, washing, and toilet (19.1%) and a drinking water source (12.8%). River water is not recommended as a drinking water source since a river is sometimes used as a place for defecating and disposing rubbish for some of rural people so it is considered that the water may cause several ailments of digestive tracts. In the control village besides utilizing springs, there were many enough of the households (29%) that used mineral water/packaged water as a drinking water. The data in details can be seen at Table 5.9.

Table 5.9 Distribution of water resources

Characteristics	Control		Intervention		Total	
	n	%	n	%	n	%
Water sources for personal cleanliness						
- Spring	20	64.5	48	51.1	68	54.8
- Well	7	22.6	22	23.4	29	23.4
- Supplied water	3	9.7	4	4.3	7	5.6
- River	1	3.2	18	19.1	18	14.5
- Others	0	0.0	2	2.1	2	1.6
Drinking water sources						
- Spring	16	51.6	54	57.4	69	55.6
- Well	5	16.1	23	24.5	28	22.6
- Supplied Water	0	0.0	4	4.3	4	3.2
- River	1	3.2	12	12.8	13	10.5
- Packaged water	9	29.0	1	1.1	10	8.1
- Others	0	0.0	0	0.0	0	0.0

Most of the households in the control village had a high awareness of cleanliness of their environment around them. This can be seen from the availability of bathrooms (83.9%) and toilets (80.6%) in their own households. Whereas, the awareness level of environmental cleanliness in the intervention villages was still low since there were 37,2% of the households which did not have

bathrooms and 52.1% of the households did not have their own toilets. Accordingly, 35.1% of the households used the river as a place for defecating, and for a few people as a drinking water source (Table 5.10).

Table 5.10 Distribution of household sanitation

Sanitation Condition	Control		Intervention		Total	
	n	%	n	%	n	%
Bathroom availability						
- Available	26	83.9	59	62.8	84	67.7
- Unavailable	5	16.1	35	37.2	40	32.3
Toilet availability						
- Available	25	80.6	45	47.9	70	56.5
- Unavailable	6	19.4	49	52.1	54	43.5
Defecating places						
- River	4	12.9	33	35.1	36	29.0
- Public toilet	0	0	11	11.7	11	8.9
- Self-owned toilet	25	80.6	42	44.7	67	54.0
- Fishpond	2	6.5	8	8.5	10	8.1
Rubbish disposal methods/places						
- Rubbish disposal areas	2	6.5	3	3.2	5	4.0
- Homeyards/rubbish holes/burnt	23	74.2	82	87.2	104	83.9
- Rivers/ditches	6	19.4	9	9.6	15	12.1

The rubbish management in the control village was not good yet for there were people disposing rubbish into the river or ditch (19.4%) even though there were people disposing rubbish in the rubbish place (6.5%) and in the homeyard, rubbish holes, or burning it (74.2%). That also occurred in the intervention villages, that is, there were still 9.6% of the households throwing rubbish into the river or ditch. As we know, throwing rubbish into the river or ditch may cause flood whose impact is not only felt by the people around the riparian areas/river course or around the ditch course but also by the people living in the lower course of the river or ditch. However, there were still some of the households whose rubbish management had already been good, that is, by disposing rubbish in the rubbish place. This is that must always be improved so that the environment is increasingly clean. The clean environment may support the increase of the nutritional status of children under five. According to Hidayat dan Fuada (without year), there is a significant correlation between a healthy environmental sanitation and a nutritional status of children under five by the body weight/age.

6

Empowering *Posyandu*

6.1 Characteristics of the Cadres

The characteristics of the *Posyandu* cadres in the control and intervention villages showed that there were differences in values among the variables (Table 6.1). The explanation for each of the variables is as in the following.

The number of household members. The number of the *Posyandu* cadres' household members ranged from three to four persons. These numbers were ideal enough, for the Indonesian Government recommendation which is put forward in the family planning program (KB) is two children per household or four persons including both of their parents. The ideal number of the cadres' household members can be as a model for the village people that the cadres implement the family planning program.

Table 6.1 Statistics of the cadres' socio-demographic characteristics

Variables	Control	Intervention
Number of household members (persons)	3.5 ± 0.6	4.4 ± 1.3
Age (year)	29.0 ± 8.2	34.8 ± 7.1
Body Mass Index (BMI) (kg/m ²)	21.0 ± 2.7	23.9 ± 3.5
Education Level (year)	9.0 ± 3.5	7.5 ± 2.7
Income (IDR/cap/month)	483,250 ± 154,799	356,336 ± 182,305
Length of staying in the area (year)	17.3 ± 10.1	32.6 ± 9.1
Length of becoming the cadres (year)	9.0 ± 6.6	5.6 ± 6.5
Number of cadres per <i>Posyandu</i> (person)	5.0 ± 0.0	3.6 ± 1.2
Number of trainings followed (times)	3.0 ± 1.4	3.2 ± 2.9

Age. Some ages of the cadres in the control and intervention villages were categorized as productive ages, that is, on average 29 years and 35 years, respectively. The cadre ages was very beneficial since physically they were strong enough and mentally they were mature enough. Thus, they were strong enough to manage the *Posyandu* activities, lift the scaling equipments etc. Accordingly, mentally they were also mature enough to make a decision connected with the *Posyandu* activities, able to control themselves in facing problems in the *Posyandu*, able to motivate and communicate well with mothers of children under five and pregnant mothers.

Body Mass Index. Body Mass Index (BMI) is a simple tool or method to monitor adults' nutritional status, particularly which is connected with a lack of (underweight) or over of body weight (overweight). Underweight may increase the risk of infectious diseases, while overweight will increase the risk of degenerative diseases (Depkes 2010). The results of this study showed that the average BMI of the cadres in the control group was lower (21.0) than that of the intervention group (23.9). However, the BMI in both of the groups belonged to normal, that is, ranging from 18.5–25.0.

Education level. The education level of the Posyandu cadres was relatively low, particularly in the intervention villages, that is, 7.5 years, while in the control village was 9 years. The Indonesian government has decided the nine year basic education program. The goal is all Indonesian citizens are able to accomplish the nine year education, that is, six years at an elementary school and three years at a junior high school. In general the cadres in the intervention villages did not finish their education at a junior high school or only graduated from an elementary school. This low education level was connected with the economic condition which was relatively still low when the cadres were school-aged, and the education programs in Indonesia were not intensively conducted.

Income Level. The income level of the cadres' household in the control village was relatively higher than that in the intervention villages, that is, approximately IDR483,000 and IDR356,000 per capita per month, respectively. This income was still under the income per capita in the national level, that is, IDR790,878 per month (BPS 2012).

Length of staying in the area. The length of stay in the village area for the cadres in the control village was lower than that in the intervention villages, that is, 17.3 years and 32.6 years. The figures showed that the cadre in the

intervention villages in general were the native people who from birth up to adult stayed in the rural village. On the other hand, in the control village there was a cadre coming from outside the village. Even though the cadre was an outsider, there was no problem or refusal from the community.

Length of being a cadre. The length of being a cadre shows the experience level of the *Posyandu* cadre. Similar to the length of staying in the area, the cadres in the control village had a higher experience as a *Posyandu* cadre than the cadres in the intervention villages, that is 9 years and 5.6 tahun. Being a *Posyandu* cadre took place naturally, meaning that someone became a cadre started from assisting the cadres in preparing the activities at *Posyandu*, and then was invited to be a cadre by the older cadres. All were voluntary. A job as a *Posyandu* cadre was a charity work and a work done among other works which were taken in by the cadres. The majority of the cadres were housewives (55.6%), some were sellers (22.2%), teachers of early-aged child education (PAUD) (16.7%), and farmers (5.5%).

Number of cadres. In each *Posyandu* number of cadre should be five person. However, in the intervention group there was only 3.6 cadres per *Posyandu*. In the control group, the number of cadre had reached 5 people. Each month a *Posyandu* provides services to the community. About 50 children under five come to *Posyandu* to be monitored their growth. It is important for *Posyandu* to have several cadres to provide good services.

Number of trainings. With low education level, cadres need training in health and nutrition, so that they are able to serve the community to improve children nutritional status. In both groups, cadres only experienced 3–3.2 trainings and more trainings were needed. By participating in this project cadres will have opportunity to have training experience in nutrition.

6.2 Cadre Participation in the *Posyandu* Implementation

Cadres are the most important element in activating *Posyandu*. Without cadres *Posyandu* will not run. Cadres are also the spearhead of a health service at the village level, particularly the health of pregnant mothers, children under five, and the elderly. Early detection of health problems at the community and village levels, for example poor nutrition can be identified from the information given by the cadres to the medical officers at the subdistrict level

or puskesmas. Even many of the cadres played a role in helping the village members get an access to a hospital at the residential and provincial levels, for example applying for a health insurance, letters of free of charge for hospital expenses, taking patients to hospital etc. The results of PRA with the mothers of children under five showed that the cadres were the closest persons and played a central role in the *Posyandu* activities.

The participation of the cadres in the *Posyandu* in the control village or in the intervention villages was very high, seen from two main indicators, that is, the high attendance in the *Posyandu* activity and the high motivation for being a cadre (Table 6.2).

The attendance level of the cadres in the *Posyandu* activities was very high. Every time there was a *Posyandu* activity held every month, all of the cadres were always present, either those in the control or those in the intervention villages. The intervention research program conducted was able to improve the cadre attendance in the intervention villages from 85.7% to 100%. If the cadres could not come to the *Posyandu*, it was due to the condition, not because of being reluctant or lazy, but because of being sick or having a family business.

Table 6.2 Participation of the cadres at *Posyandu*

Statement	Control				Intervention			
	Baseline		Endline		Baseline		Endline	
	n	%	n	%	n	%	n	%
Always present in the last three months	4	100.0	4	100.0	12	85.7	14	100.0
Reasons if not present								
- sick	0	0.0	0	0.0	1	50.0	0	0.0
- family matters	0	0.0	0	0.0	1	50.0	0	0.0
- Wish to be cadres forever	4	100.0	4	100.0	13	92.9	12	85.7

The cadre motivation to remain to dedicate themselves to the community through *Posyandu* was also very high, almost all of the cadres expressed their wish to be cadres as long as possible. The main motivation of the cadres to take participation in the *Posyandu* activities was an altruistic wish, that is, charity, voluntary, serving the God, and getting merit from the God. As stated by the cadres, among others are: (1) to improve the rural community; (2) to help the rural community especially pregnant mothers, children under five, and

infants in improving their health; (3) to get some health knowledge; (4) to get merit and blessing from the God; and (5) inner motivation. Some other cadres stated that being involved in the *Posyandu* was due to fulfilling their spare time, getting many friends, and supporting their husband's job as the head of RT (smallest level of village).

The high participation of the cadres in the *Posyandu* activities was also connected with the benefits perceived by the cadres. More advantages they got were stated by the cadre respondents compared with the disadvantages. The advantages stated by them were: (1) beneficial for the community and helping others, (2) increasing their knowledge on health and nutrition, (3) known by the community, getting many friends and able to exchange experience and knowledge among the friends, (4) able to have free treatment for their health problems, and (5) their power was utilized for many people's interest. Whereas, a small number of the respondents stated the disadvantages was taking time, occupied and tired.

As a government appreciation to *Posyandu* cadres, the government give a financial incentive whose value is not big enough. None of the cadres stated that they became cadres because there was the incentive. For the cadres the government aid was only as a "*bonus*" for the service they gave to the community.

The amount of the financial incentive received by the cadres in each *Posyandu* ranged from IDR20,000 to IDR50,000 per month (about US\$2–5 per month) (Tabel 6.3). On average the cadres in the control village received the greater amount of the incentive from the local government than the amount of the incentive in the intervention villages. The difference was because the incentive from the government was given based on the number of the legal cadres registered in the puskesmas. And, in fact in the intervention villages there were cadres who were not legally registered and not receive the incentive. By the legal cadres, the incentive was also shared to the cadres who assisted them, so the amount of the money received by each of the cadres became smaller.

The financial incentive from the government was not always received regularly by the cadres. 50% of the cadres in the control village stated had not received the incentive in one last year, while in the intervention villages there was one (7.1%) of the cadres who stated that the incentive had not been

received. Through this research intervention program all of the cadres in the intervention villages obtained a financial incentive.

Table 6.3 Distribution of the cadres by incentive received

Incentive	Control				Intervention			
	Baseline		Endline		Baseline		Endline	
	n	%	n	%	n	%	n	%
Receiving Incentive								
- Yes	4	100.0	2	50.0	13	92.9	14	100.0
- No	0	0.0	2	50.0	1	7.1	0	0.0
Amount of incentive received (IDR/month)								
- 20,000–30,000	0	0.0	0	0.0	14	100.0	5	35.7
- >30,000–50,000	4	100.0	2	100.0	0	0.0	9	64.3

In addition to money as a monthly incentive, the government incidently gives an appreciation in other forms. Like what was stated by the cadres, they had ever received a clothe uniform, a free-of-charge treatment, and a certificate/ charter of appreciation.

The cadres did not demand much to the government or the community in their surroundings to get an exaggerated appreciation. Wishes stated by the cadres, among others, were: (1) the incentive needed to be improved a bit and given regularly, (2) increasing the number of *Posyandu* equipments; (3) built a *Posyandu* building since the *Posyandu* activities were held in a house belonging to one of the community members, and (4) provision of a clothing uniform, shoes, and bag which would be used when having a meeting with the cadres in different places. Even, some of the cadres stated that the available appreciation was enough, not wishing another appreciation; the appreciation was enough from the God, and that the community members were active going to *Posyandu* was enough for them as their appreciation.

The tasks carried out the cadres in the *Posyandu* activities were around the services at *Posyandu* and communicated the *Posyandu* to the community including encouraging the community to visit the *Posyandu*. Table 6.4 showed the task components in details performed by the cadres at *Posyandu*. The cadres actively gave information to the mothers of children under five about the schedule of the *Posyandu* implementation and invited the mothers of children under five to come to *Posyandu* (77.8%). Before the activities of

the *Posyandu* services were done, the cadres prepared a supplementary feeding which would be given the children under five and the equipments needed, such as a scale, mattress and pillow to examine the pregnant women, cards to monitor the body weight of the infants and immunization, *kartu menuju sehat* (KMS)—a card to a healthy state—as well as books for notes/reporting the activities.

Based on the *Posyandu* system which has been decided by the government, knowns as the five-table service, that is, table 1: registration for pregnant mothers and children under five; table 2: weighing the children under five and pregnan mothers; table 3: recording the weighing result, table 4: counselling the mothers of children under five; and table 5: health services, therefore, the tasks which were directly done by most of the cadres were activities at the weighing and recording table. Whereas, for counselling services, the cadres did not do them much, and for health services were commonly not done directly by the cadres. More of the cadres assisted the outside parties who gave counselling or the midwife. The health-service table provided services of immunization and giving drugs and vitamins to the pregnant mothers. The tasks of the cadres in the health services were very low, that is, only one person involved (5.5%) because at this table the services were performed by the medical officers from the subdistrict or the village midwife.

Table 6.4 Distribution of the cadres by task in the *Posyandu* implementation

Tasks	n	%
Giving information on the schedule of <i>Posyandu</i> implementation	14	77.8
Inviting the mothers to join <i>Posyandu</i>	14	77.8
Preparing the <i>Posyandu</i> equipments	13	72.2
Assisting to prepare a supplementary feeding	13	72.2
Assisting the children weighing	14	77.8
Assisting the counselling at <i>Posyandu</i>	13	72.2
Assisting the recording	15	83.3
Giving an immunization service	1	5.5
Giving drugs to the pregnant mothers	1	5.5

The nutrition counselling activities regularly done by the cadres in the intervention villages were relatively low (42.9%) while in the control village they were high (100%) as shown in Table 6.5. However, after the intervention program in this study there was a significant increase in the cadres who gave a nutrition counselling regularly.

Table 6.5 Distribution of the cadres by nutritional counselling at *Posyandu*

Counselling Implementation	Control				Intervention			
	Baseline		Endline		Baseline		Endline	
	n	%	n	%	n	%	n	%
Cadres regularly gave a counselling at <i>Posyandu</i>	0	100.0	4	100.0	6	42.9	10	71.4
Reasons if not giving counselling:								
- The midwife gave counselling	0	0.0	0	0.0	3	37.5	2	50.0
- If only there was a certain case	3	75.0	0	0.0	1	12.5	0	0.0
- Mothers of children under five were busy and occupied	1	25.0	0	0.0	0	0.0	0	0.0
- No command from the cadre leader	0	0.0	0	0.0	1	12.5	0	0.0
- There was another cadre	0	0.0	0	0.0	1	12.5	0	0.0
- The cadre was lack of self-confidence	0	0.0	0	0.0	1	12.5	2	50.0
- Occupied/busy	0	0.0	0	0.0	1	12.5	0	0.0

The main reason stated by the cadre respondents on their low involvement in the counselling was the cadres were lack of self-confidence to give a nutritional counselling to the *Posyandu* members. Counselling is the task of the midwife, and counselling was performed when there was a certain incident, for example a poor-nutrition case.

Based on the stages of the participation process, the cadre participation in the *Posyandu* activities started from planning, implementation, and evaluation. At the planning stage, the task done by the cadres, among others, were: deciding the schedule (day and date) of the activity, informing the schedule to the mothers of children under five and the pregnant mothers, allocating the tasks among the cadres, visiting the mothers of children under five in their house if the mothers did not come to *Posyandu*, preparing the *Posyandu* equipments, and cleaning the rooms. At the time of the national program schedule, such as, giving vitamin A and polio immunization massively, the cadres will intensively inform the visiting schedule to *Posyandu* to each of the households which had children under five.

At the implementation stage, the cadre participation was performed on the day of the *Posyandu* activity implementation. As has been explained previously, the cadres took part in the weighing of the children under five, as well as assisting the medical officer/midwife in immunization and examination of the pregnant mothers.

Different from the planning and implementation stages, at the evaluation stage there were not many tasks carried out by the cadres. In general the evaluation was done after the *Posyandu* activities were over, and the matters which would be evaluated were the numbers of the children under five and the pregnant mothers who come to the *Posyandu*, and discussion on the mothers of children under five and the pregnant mothers who did not come.

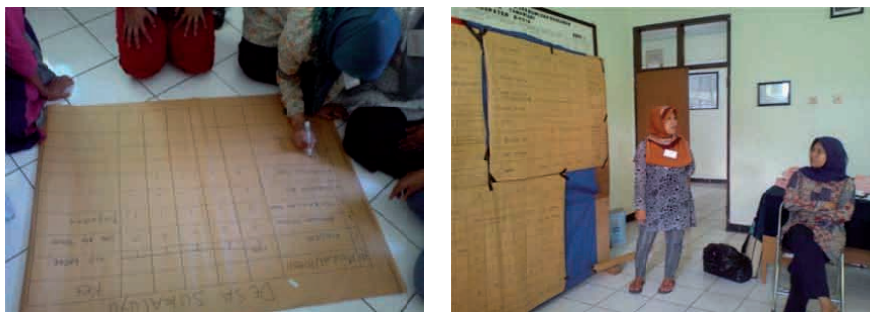
The thing that was done by the cadres if the mother of children under five did not bring their children under five to weigh at the *Posyandu* was the cadres actively visited the mothers in their own house. The cadres would ask the reason for not coming to *Posyandu*, remind the importance of *Posyandu* for their children, and motivate the mother of children under five to bring their children to *Posyandu*.

Monitoring towards the appearance of a poor nutrition case was also done by the *Posyandu* cadres. The information that there was a child under five who suffered from poor nutrition could be known from the KMS which showed no increase of the body weight of the child under five significantly, or from the community members' information. If found children under five in a poor nutrition condition, the cadres would inform them to *Puskesmas* (community health center) to get a quick treatment. If their conditions were severe, the children under five with poor nutrition would be referred to the residential hospital, but if their condition was so severe, the *Puskesmas* would give an aid of supplementary food to the children under five. The cadres would monitor and directly accompany the children under five and give motivation to the mothers of children under five to improve the eating/food patterns of their children under five.

A good *Posyandu* administration requires funds. However, in fact *Posyandu* faced an obstacle to finance it. The obstacles faced were a small amount of

money allocated and getting the fund irregularly. It was admitted by most of the cadres (83.3%) that there was no routine budget for the *Posyandu*. The *Posyandu* funds were mostly obtained from the residential government, and only one *Posyandu* that got the fund from the allocation of the village government. The amount of the money allocated to each of the *Posyandus* was IDR30,000 to IDR80,000 per 3 months. Most of the financial funds were used for giving supplementary food to children under five. The small amount of the fund resulted in each *Posyandu* activities that did not provide any supplementary food.

Based on the result of the cadre FGD which used a PRA technique (trend timeline) it was known that the problems in the *Posyandu* administration in each of the villages were relatively similar, among others, were: the limited number of the cadres and cadre training, a low participation of the mothers of children under five, the availability of supplementary food and limited *Posyandu* equipments. In details the *Posyandu* problems and the condition-change trend within the last three years in each of the studied villages, which came from the results of the FGD with the *Posyandu* cadres by using a technique, trend timeline, are displayed in Table 6.6–6.8 as follows.



Picture 6.1 PRA technique (*trend timeline*)

Table 6.6 *Posyandu* problems and a condition-change trend in the last three years in Village Sukajaya

No.	Problems	Year 2010	Year 2011	Year 2012	Note
1	Building	Only one permanent building	Only one which was permanent	Only one which was permanent	Not all of the <i>Posyandus</i> owned their own buildings, so the <i>Posyandus</i> used the cadre house. There was only one legal building provided by the government
2	Bed, chair, table, step scale/baby scale	Unavailable	Unavailable	Unavailable	Unavailable
3	Participation of mothers of children under five	Decreasing	Decreasing	Decreasing	Decreasing because of being afraid their children got fever due to immunization
4	Supplementary feeding	Inadequate	Inadequate	Inadequate	Frequency of the supplementary feeding was very low
5	Cadres trainings	Available	Unavailable	Unavailable	Decrease in the number of the cadre trainings

Table 6.7 *Posyandu* Problems and a condition-change trend in the last three years in Village Sukaluyu

No.	Problems	Year 2010	Year 2011	Year 2012	Note
1	Number of cadres	Constant	Constant	Constant	The number of the cadres remained constant within the last three years.
2	<i>Posyandu</i> building	Unavailable	Unavailable	Unavailable	No <i>Posyandu</i> buildings yet
3	Baby scale, table and chair, bed and mattresses	Unavailable	Unavailable	Unavailable	Unavailable
4	Children under five of poor nutrition	Decreasing	Decreasing	Decreasing	The number of children with poor nutrition decreased from year to year
5	Operational funds	Inadequate	Inadequate	Inadequate	The operational funds were limited
6	Participation of mothers of children under five visiting <i>Posyandu</i>	Increasing	Increasing	Increasing	The number of children under five visiting <i>Posyandu</i> increased from year to year
7	SKDN block (diagram of children nutrition improvement and participation)	Unavailable	Unavailable	Unavailable	Unavailable
8	KMS (children growth chart)	Inadequate	Inadequate	Inadequate	KMS were inadequate and the mothers of children under five had to copy the card by themselves.

Table 6.8 *Posyandu* problems and a condition-change trend in the last three years in Village Sukaresmi

No.	Problems	Year 2010	Year 2011	Year 2012	Note
1	Number of cadres	constant	constant	constant	The number of the cadres was constant from year to year
2	Participation of mothers of children under five	constant	decreasing	decreasing	Decreasing from year to year due to the mothers' occupation
3	Supplementary feeding	decreasing	decreasing	decreasing	Decreasing due to unavailability of financial supports
4	KMS/KIA (children growth chart)	inadequate	inadequate	inadequate	If inadequate, the cadres or mothers of children under five had to copy by themselves
5	Media or posters	unavailable	unavailable	unavailable	The Health Office may not distribute it
6	Cadre trainings	available	unavailable	unavailable	Decrease in the number of the cadre trainings
7	<i>Posyandu</i> equipments	incomplete	incomplete	incomplete	For instance, health media, permanent bed and mattress for examination of pregnant mothers (still borrowing from the cadre), inadequate number of chairs

6.3 Perception of the Cadres on *Posyandu*

In efforts for the improvement of both *Posyandu* and cadre performance, in serving the community, particularly in the community health and nutrition matters, it is necessary to pay attention to the view from the perspectives of the *Posyandu* cadres who had enough knowledge and empirical experiences

in the community. Everyday the cadres deal with problems faced by the community, so they can understand what is felt by the community. Therefore, it is necessary to know the perception of the cadres on those matters that need to be increased in order to improve the *Posyandu* performance.

There were many things at the *Posyandus* which needed to be improved (Table 6.9). The main activities to be improved either in the control village or in the intervention villages were counselling, supplementary feeding, procurement of KMS (children growth chart), and provision of vitamin A capsules. The activities which needed to be improved at the *Posyandus* were connected with the weakness of those activities. For example, the number of KMS which were limited was not comparable with the number of children under five so the cards were provided by the cadres in a copied form, the limited fund for supplementary feeding, the irregular counselling, and the limited vitamin A stock.

Table 6.9 Perceptions of the cadres on the *Posyandu* activities necessary to be improved

<i>Posyandu</i> Activities	Control		Intervention	
	n	%	n	%
Counselling	4	100.0	14	100.0
Supplementary feeding	4	100.0	13	92.9
Weighing children under five	3	75.0	12	85.7
Immunization	3	75.0	11	78.6
Iron-Tablet provision	3	75.0	10	71.4
Procurement of KMS	4	100.0	12	85.7
Family planning service	3	75.0	13	92.9
Pregnancy examination	3	75.0	12	85.7
Provision of vitamin A capsules	4	100.0	12	85.7

Based on the cadre perception, the obstacles in the implementation of *Posyandu* activities, in addition to the internal ones in the *Posyandu* as stated above, there were also external obstacles which came from the community, cadres, and the medical staff. The basic obstacle was the reluctance of the mothers to take their children under five to *Posyandu*, even though the number was relatively small. The reasons put forward, among others, were being ashamed of the other mothers of children under five since their children's body weight did not increase, not willing their children to be immunized, and a far distance

of the *Posyandu* from their houses. The reason for the mothers not wanting their children to be immunized was after the immunization their children became fever even though in fact the midwife had given a fever-reducing medicine after the immunization. It was also found a reason that the serum which was immunized was not halal (accepted to be consumed or applied in the body of a muslim according to a muslim belief) so it was haram (not allowed to be consumed or applied in the body of a muslim).

The obstacles coming from the cadres themselves, even though they were rare, among others, were that there was a personal problem among the cadres and there was a cadre who was less active. These problems were due to miscommunication or misunderstanding among the cadres. The fact that the children were difficult to weigh or hard to please when weighed and immunized was also complained by the cadres.

The problems coming from the medical officer/midwife, according to the cadres were sometimes the midwife did not come on the stated schedule so this made the *Posyandu* members disappointed who had gathered at the *Posyandu*. The unfriendly medical officer was also complained by the cadres and the *Posyandu* members, as it happened when there was a temporary substitution of a medical officer who used to serve at the *Posyandu* because she was on her maternal leave, and her substitute was considered by the *Posyandu* members as unfriendly and easy getting a bad temper if the body weight of the children under five did not increase.

6.4 Participation of the Mothers of Children under Five in the *Posyandu* Implementation

The participation of the mothers of children under five in the *Posyandu* implementation was the main factor in achieving the improvement of community basic health and nutritional status, particularly children under five. Their participation was shown by how frequent the mothers brought their children under five to *Posyandu*, as illustrated in Table 6.10 and what had been done by the mother to the *Posyandu* started from planning, implementation to its evaluation as shown in Table 6.16.

As a whole the highest percentage (68.5%) of the respondents visiting the *Posyandus* for during the last one year was eight times. A similar case was also

observed in the control and intervention groups, the highest percentage of the respondents visiting the *Posyandus* was eight times. If viewed from the average frequency of visiting, the intervention group had a higher average frequency of visiting to *Posyandu* (9.5 times) than the control group (7.3 times). The presence of the *Posyandu* assistance and nutritional counselling by the research team, the fulfillment of *Posyandu* equipments and supplementary feeding every month during the intervention period motivated the respondents in the intervention group to visit the *Posyandus* routinely. Ocbrianto (2012) stated that one of the factors affecting a visit of the mothers of children under five to a *Posyandu* was the completeness of the *Posyandu* facilities. The result of a study conducted by Nikmawati (2010) showed that supplementary feeding was one of the powers of attraction which was able to increase the participants' interest to weigh the children at the *Posyandu*.

Table 6.10 Distribution of visit frequencies of the mothers of children under five to the *Posyandus* during the last one year

Visit to <i>Posyandu</i>	Control		Intervention		Total	
	n	%	n	%	n	%
<5 times	6	19.4	10	10.8	16	12.9
5–8 times	8	25.8	15	16.1	23	18.5
>8 times	17	54.8	68	73.1	85	68.5
Total	31	100.0	93	100.0	124	100.0
Mean ± Std	7.3 ± 3.7		9.5 ± 3.1		8.9 ± 3.4	

Based on the last three month data there were more than half of the total number of the mothers of children under five visited the *Posyandu* routinely. The condition was also observed in the control group (67.7%) or in the intervention one (68.8%). However, more that one third of the mothers of children under five in the control group (32.3%) and in the intervention one (31.2%) did not visited *Posyandu* within the last three months (Table 6.11). The reasons the mothers of children under five did not visit *Posyandu* were their children did not want, the mothers went out, and the children were sick, while other reasons stated by the mothers of children under five in the intervention group were unnecessary to visit *Posyandu*, their mothers were occupied, lazy, and sick. According to Djaiman (2002) the factors associated with visits of mothers of children under five to *Posyandu* were the age of children under five, childbirth helpers, reading ability, number of children, status of mother occupation, and the availability of time for mothers to take care of their children.

Based on the results of the FGD with the mothers of children under five, the reasons that made the mothers brought their children to *Posyandu* were as follows: the mothers knew the child development, obtained a health service, the cadres were enthusiastic, the cadres came on time, got a help if they had to go to hospital, their children's body weight increased, vitamin provision, a national immunization event, and family invitation/encouragement.

On the other hand, the reasons which were expressed by the mothers of children under five on the things that made them not come to *Posyandu* were: the midwife did not come, they were occupied at home, their children were too many, they were ashamed if their children's body weight decreased, they were afraid if the children got fever because of communication, their houses were located far from the *Posyandus*, the children did not want to be weighed, the mothers blastered at their children of the injection if their children were obstinate, the mothers were lazy, the cadres were not active, the facilities were limited, and the elucidation was unavailable.

Table 6.11 Distribution of visit frequency of the mothers of children under five to *Posyandu* within the last three months

Visits to <i>Posyandu</i>	Control		Intervention		Total	
	n	%	n	%	n	%
To <i>Posyandu</i> within the last three months						
- Yes	21	67.7	64	68.8	85	68.5
- No	10	32.3	29	31.2	39	31.5
Reasons for not visiting <i>Posyandu</i> during the last three months:						
- It was unnecessary	0	0.0	1	3.4	1	2.6
- Mothers were occupied	1	10.0	3	10.4	4	10.3
- Mothers were lazy	0	0.0	5	17.2	5	12.8
- Children were unwilling	3	30.0	5	17.2	8	20.5
- Children were sick	2	20.0	3	10.4	5	12.8
- Mothers went out	3	30.0	3	10.4	6	15.4
- A child was just born	0	0.0	2	6.9	2	5.1
- Mothers were sick	0	0.0	2	6.9	2	5.1
- Others	1	10.0	5	17.2	6	15.4

Most of the mothers of children under five (more than 80%) would followed *Posyandu* until the children reached five years old. The condition could be found either in the control (87.1%) of in the intervention one (89.2%). Over 10% of the mothers of children under five would not join *Posyandu* for five years but they would join the *Posyandu* for one to three years old since their children did not want, they were lazy, and the immunization had been completed (See Table 6.12). According to Djaiman (2002) the factor which very much affected the visit of children under five to *Posyandu* was age. Ages 12 to 35 months were ages which affected the visit to *Posyandu*. The mothers of children under five would not be present to *Posyandu* anymore particularly if the children were over 36 months, because the mothers felt that their children had got a complete immunization and their children's social development was increasingly developed.

Table 6.12 Distribution of the mothers of children under five to join *Posyandu* until their children reach 5 years old

Statements	Control		Intervention		Total	
	n	%	n	%	n	%
To follow <i>Posyandu</i> until the child reaches 5 years old						
- Yes	27	87.1	83	89.2	110	88.7
- No	4	12.9	10	10.8	14	11.3
If not, until how many years will your child be?						
- 1 year	1	25.0	1	10.0	2	14.2
- 2 years	1	25.0	6	60.0	7	50.0
- 3 years	2	50.0	3	30.0	5	35.8
Reason for not coming to <i>Posyandu</i> until the child reaches 5 years old:						
- The child does not want	2	50.0	2	20.0	4	28.6
- The mother is lazy	2	50.0	1	10.0	3	21.4
- The child's immunization is completed	0	0.0	5	50.0	5	35.7
- Others	0	0.0	2	20.0	2	14.3

Almost all of the mothers under five (92.6%) took their children by themselves to *Posyandu* and all of their household members supported them to visit *Posyandu* regularly (Tabel 6.13). Even though the number was small (3.2%), there were still some household members who did not support the mothers of children under five to visit *Posyandu*, either in the control group or in the intervention group (3.2%). The household members who did not support were their husbands and their parents in law, with the reason that their children were called being malnourished because their body weights were below the red line and the children became sick.

Table 6.13 Household supports to the visit of the mothers of children under five to *Posyandu*

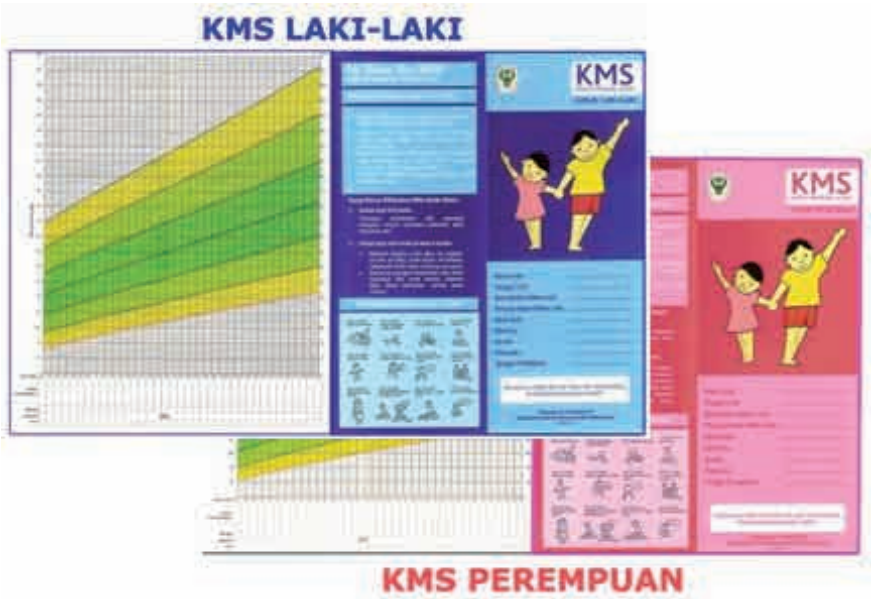
Statements	Control		Intervention		Total	
	n	%	n	%	n	%
Taking their children to <i>Posyandu</i> by themselves						
- Yes	30	96.8	83	91.2	113	92.6
- Sometimes	0	0.0	7	7.7	7	5.7
- No	1	3.2	1	1.1	2	1.7
Is there any household member not supporting a visit to <i>Posyandu</i> ?						
- Yes	1	3.2	3	3.2	4	3.2
- No	30	96.8	90	96.8	120	96.8

As a whole the highest percentage of the reasons of the mothers of children under five for taking their children to *Posyandu* was in order that their children were healthy (84.7%). Other reasons expressed by the mothers of children under five were in order that their children got immunization (44.4%), in order that the children's body weight was monitored (64.5%) and other reasons (19.3%) as displayed in Table 6.14. If viewed from the treatment, the highest percentage stated by the mothers of children under five in the control group was in order that the children's body weight was monitored (83.9%) and in the intervention group in order that the children were health (91.4%) so their children were taken to *Posyandu*.

Table 6.14 Distribution of the reasons for the mothers of children under five
visiting *Posyandu*

Statements	Control		Intervention		Total	
	n	%	n	%	n	%
In order the child is healthy	20	64.5	85	91.4	105	84.7
To get immunization/vit A capsules	17	54.8	38	40.9	55	44.4
In order the child’s body weight is monitored	26	83.9	54	58.1	80	64.5
Others*	8	25.7	16	17.3	24	19.3

* getting a free-of-charge family planning service, meeting other mothers, getting supplementary feeding, getting nutritional and health knowledge, and encouraged by the cadres/RT/RW organizers.



Picture 6.2 KMS (children growth chart)

More than 80 percents of the mothers of children under five hold a KMS, even in the control group 90.4 percents of the mothers hold it (Table 6.15). Some of the mothers of children under five who did not have KMS were

because the card was kept by the cadres. According to Kuntari (2011) the results of an observation in the field showed that the KMS was often kept by the officer so the function of KMS became not optimal. Ideally the KMS was always brought and kept by the mothers in question, so they were able to monitor the growth and development of their children. Therefore, KMS was one of important measurement instruments to monitor a health development required by children under five.

Table 6.15 Distribution of the mothers of children under five by KMS (children growth chart) ownership

KMS Ownership	Control		Intervention		Total	
	n	%	n	%	n	%
Having	28	90.4	78	83.8	106	85.5
Not having	3	9.6	15	16.1	18	14.5

Participation of the mothers of children under five in the administration of *Posyandu* activities started from planning, implementation up to the evaluation was very low. The activities were dominantly carried out by the *Posyandu* cadres. Table 6.16 showed that most of the mothers of children under 5 (82.3%) had never taken participation in the *Posyandu* activities, either in the control group (77.4) or in the intervention one (91.4). A few of the mothers of children under five sometimes took participation usually by giving funds ranging from around IDR500 to IDR1,000, even there were who contributed more than IDR1,000 (Table 6.13). The results of a study conducted by Ocbrianto (2012) mentioned that besides a participation in a form of funds, other forms of participation performed by the mothers of children under five were material participation (providing the supplementary food), assissting the implementation of *Posyandu* activities, encouraging and always reminding the husbands when there was a *Posyandu* meeting, their wives should be active in the *Posyandu* activities. Ocbrianto's (2012) further finding stated that the factors affecting the participation of mothers of children under five in the *Posyandu* activities were internal and external ones. Internal factors included knowledge, staying duration, type of jobs, age, habit, and

need. External factors included household and community supports, facilities/ location of *Posyandu*, and the program usefulness.

Table 6.16 Participation of the mothers of children under five in the *Posyandu* implementation

Statement	Control		Intervention		Total	
	n	%	n	%	n	%
Giving a financial share						
- Sometimes	7	22.6	8	8.6	15	17.7
- Never	24	77.4	85	91.4	102	82.3
If giving, how much?						
- IDR500–1,000	5	71.4	6	75.0	11	73.2
- >IDR1,000–5,000	2	28.6	2	25.0	4	26.8

Supplementary feeding is one of the programs carried out by *Posyandu* to help improve the nutritional status of children under five. The results of this study was the supplementary foods which were often provided at the *Posyandus* were egg, bean porridge, rice porridge, and biscuit. According to the perception of the mothers of children under five, egg and rice porridge were still considered inadequate in amount, while those considered had been enough were bean porridge and biscuit. In addition those types of supplementary food provided, there were still other types of supplementary food provided even though the provision was seldom, that is, fruit, rice-powder porridge, milk, and seaweed jelly (Tabel 6.17). Those conditions were found in the control group and the intervention one. The result of a research conducted by Nikmawati (2010) showed that the service to get the supplementary food was still insufficient, in fact, the supplementary food provision was one of powers of interest which could increase the participants' interest to weigh their children at *Posyandu*.

The highest percentage (72.9%) of the mothers stated that the things needs to be improved in the counselling was the counselling materials. A similar thing was also stated by the mothers in the control group (83.4%) or in the intervention one (70.2%). Other things connected with counselling which need to be improved were the counsellor and the counselling media.

Table 6.17 Perception of the mothers on the service of supplementary food provision at *Posyandu*

Types of supplementary foods	Control		Intervention		Total	
	n	%	n	%	n	%
Egg						
- Adequate	0	0.0	0	0.0	0	0.0
- Inadequate	0	0.0	0	0.0	0	0.0
- Not provided	3	100.0	8	100.0	11	100.0
Bean porridge						
- Adequate	18	90.0	33	78.6	51	82.3
- Inadequate	2	10.0	8	19.0	10	16.1
- Not provided	0	0.0	1	2.4	1	1.6
Rice Porridge						
- Adequate	1	20.0	0	0.0	1	7.7
- Inadequate	0	0.0	0	0.0	0	0.0
- Not provided	4	80.0	8	100.0	12	92.3
Biscuit						
- Adequate	15	88.2	10	55.6	25	71.4
- Inadequate	1	5.9	4	22.2	5	14.3
- Not provided	1	5.9	4	22.2	5	14.3
Others						
- Fruit	2	8.3	0	0.0	2	2.8
- Rice powder porridge	4	16.7	3	6.5	7	10.0
- Milk	5	20.8	1	2.2	6	8.6
- Seaweed jelly	0	0.0	4	8.7	4	5.7

Table 6.18 Perception of the mothers on the counselling program at the *Posyandus*

Statements	Control		Intervention		Total	
	n	%	n	%	n	%
Counselling administration						
- Routine	1	3.2	6	6.5	7	5.6
- Sometimes	11	35.5	41	44.1	52	41.9
- Not held	19	61.3	46	49.4	65	52.4
Things need to be improved in counselling						
- Counselling contents	10	83.4	33	70.2	43	72.9
- Counsellor	7	58.3	28	59.6	35	59.3
- Counselling media	7	58.3	30	63.8	37	62.7

Almost all of the mothers (97.6%) stated that the *Posyandu* role was important. More than half of the mothers (54.8%) stated that the *Posyandu* services available in their areas had already been good. If viewed by treatment, the *Posyandu* services which had been good were stated more by the mothers from the control group (67.7%) than from the intervention group (50.5%). However, there were approximately 12.9% who stated that the *Posyandu* services were not good. The *Posyandu* services which were not good were stated by 6.5% of the mothers from the control group and 15.1% from the intervention group (Table 6.19).

Table 6.19 Perception of the mothers on the roles and services of the *Posyandu*

Roles and Services of <i>Posyandu</i>	Control		Intervention		Total	
	n	%	n	%	n	%
Roles of <i>Posyandu</i>						
- Unimportant	0	0.0	1	1.1	1	0.8
- Less important	0	0.0	2	2.2	2	1.6
- Important	31	100.0	90	96.8	121	97.6
Services of <i>Posyandu</i>						
- Not enough	2	6.5	14	15.1	16	12.9
- Enough	8	25.8	32	34.4	40	32.3
- Good	21	67.7	47	50.5	68	54.8

Table 6.20 Perception of the mothers on the adequacy of the *Posyandu* facilities

<i>Posyandu</i> Facilities	Control		Intervention		Total	
	n	%	n	%	n	%
Adequacy of <i>Posyandu</i> Facilities						
- Incomplete	12	38.7	44	47.3	56	45.2
- Complete	19	61.3	49	52.7	68	54.8
Facilities considered incomplete:						
- Scale	5	41.7	8	18.2	13	23.2
- Microtoise	5	41.7	13	29.5	18	32.1
- Divan	0	0.0	4	9.1	4	7.1
- Chair and mattress	0	0.0	4	9.1	4	7.1
- Microtoise and divan	2	6.5	5	11.4	7	12.5
- Scale and microtoise	0	0.0	7	15.9	7	12.5
- All of the facilities	0	0.0	2	4.5	2	3.6

The highest percentage (54.8%) of the mothers stated that the *Posyandu* facilities were complete, and as many as 45.2% of the mothers stated that they were incomplete. In general the facilities which were considered incomplete by most of the mothers were scales (23.2%), microtoise (32.1%), and even 4.5% of the mothers in the intervention group stated all of the facilities at the *Posyandus* were considered still incomplete (Table 6.20).

Table 6.21 Perception of the mothers on the programs requiring improvement at the *Posyandu*

<i>Posyandu</i> programs requiring improvement	Control		Intervention		Total	
	n	%	n	%	n	%
Counselling	28	90.3	85	91.4	113	91.1
Supplementary feeding	29	93.5	86	92.5	115	92.7
Weighing children under five	20	64.5	63	67.7	83	66.9
Immunization	15	48.4	54	58.1	69	55.6
Iron tablet	18	58.	61	65.6	79	63.7
KMS provision	13	41.9	53	57.0	66	53.2
Family planning service	18	58.1	61	65.6	79	63.7
Gestation examination	17	54.8	60	64.5	77	62.1
Vitamin A capsule	17	54.8	52	55.9	69	55.6

Most of the mothers (over 90%) had a perception that the *Posyandu* programs that needed improvement were counselling and supplementary feeding (Table 6.21). According to Jazid (1991) the facilities available at *Posyandu* are of paramount importance and affect the service smoothness as well as affect the quality and kinds of activities at *Posyandu*. Puspasari (2002) also states that the smoothness of *Posyandu* activities, in addition to requiring a suitable place, must also be supported by the availability of other supporting equipments.

Based on the result of the FGD, the mothers of children under five stated that the problem-solving which could be done to overcome the problems faced by the *Posyandu* and at the same time to improve the community participation at the *Posyandu* can be seen in Table 6.22.

Table 6.22 Components, problems, and suggestions for overcoming the problems at the *Posyandu*

Components	Problems	Suggestion for improvement
Immunization	<ul style="list-style-type: none"> - Immunisation will only be performed if there are at least five children - If there is only one child, the child can be directly taken to the public health centre but s/he must pay if s/he does not have a health insurance card (<i>jamkesmas</i>—a community health insurance) 	<ul style="list-style-type: none"> - Should be re-coordinated with the midwife and the public health centre - Should be given a drug as a fever reducer
Cadre	<ul style="list-style-type: none"> - The number of the <i>Posyandu</i> cadres is inadequate 	<ul style="list-style-type: none"> - Increasing the number of the <i>Posyandu</i> cadres - Holding a cadre training - Being more active - Increasing the incentive for the cadres
Midwife	<ul style="list-style-type: none"> - Not always present on the scheduled day 	<ul style="list-style-type: none"> - The midwife should always come and bring enough vaccines to the <i>Posyandu</i> - If the midwife will be on leave, she must find her substitute first - Should not change the schedule without any announcement before - If the midwife is not present, try to find her substitute - The midwife has to be punctual for children want to go home quickly - The midwife has to respond quickly to the children who want to be immunized

Table 6.22 Components, problems, and suggestions for overcoming the problems at the *Posyandu* (cont.)

Components	Problems	Suggestion for improvement
Facilities	<ul style="list-style-type: none"> - The limited <i>Posyandu</i> equipments - <i>Posyandu</i> uses the house of the community member 	<ul style="list-style-type: none"> - KMS must be provided in a greater number and KIA books must be procured - Increasing the number of tables, providing a bed for a examination of the pregnant mothers - Building a <i>Posyandu</i> building or <i>Posyandu</i> rooms
Counselling	<ul style="list-style-type: none"> - Counselling is rarely done, and there is no practice 	<ul style="list-style-type: none"> - It is necessary to hold a counselling or elucidation, which is more frequent but not too long in presenting the materials - It is necessary to perform activities to practice what has been explained in the elucidation
Supplementary feeding	<ul style="list-style-type: none"> - It is rarely provided with a supplementary food - The food are not varied - The amount is sometimes inadequate 	<ul style="list-style-type: none"> - Should be provided more frequently - The foods should be more varied - The amount should be increased
Mother	<ul style="list-style-type: none"> - The mothers do not routinely take their children to <i>Posyandu</i> 	<ul style="list-style-type: none"> - The mothers should actively visit <i>Posyandu</i> - The mothers should be clever in persuading their children so that they want to be taken to <i>Posyandu</i> - Do the household chores early in the morning

Table 6.22 Components, problems, and suggestions for overcoming the problems at the *Posyandu* (cont.)

Components	Problems	Suggestion for improvement
Household	<ul style="list-style-type: none"> - There is a household members who does not support the mother to visit <i>Posyandu</i> 	<ul style="list-style-type: none"> - It is necessary to perform a counselling to the households/husbands to support the mothers to take their children to <i>Posyandu</i> - There should be a support from the husbands - The husbands should be more aware of the importance of visiting <i>Posyandu</i>

The research result showed that the highest percentage of the mothers stated the performance of the *Posyandu* cadres had been good, particularly in the cadre skills, their active participation, and their hospitality, while in regard to the number of the cadres, the number was categorized as enough. The condition can be observed in the control group or in the intervention one. However, it was still found that the cadre performance was still lack, particularly in the number and skill of the cadres. In total, the percentage of the mothers who stated 'lack' in the case of the cadre skill (17.7%) and of the cadre number (25.8%) was relatively high compared to two other performances, that is, the active participation (13.7%) and the hospitality (8.1%) of the cadres. Darmawati (2001) stated that the knowledge of the cadre was categorized as 'lack', likewise, the knowledge on the other main tasks which must be done by the cadres was still very limited. It was because most of the cadres had never followed any cadre training. Nikmawati (2010) stated that knowledge improvement and training for the cadres needed to be improved to increase their knowledge and skills so that the cadres were able to perform their tasks and functions as expected.

Table 6.23 Perception of the mothers on the performance of the *Posyandu* cadres

Performance of the cadres	Control		Intervention		Total	
	n	%	n	%	n	%
Cadre skill						
- lack	5	16.1	17	18.2	22	17.7
- adequate	9	29.0	38	40.9	47	37.9
- good	17	54.8	28	40.9	55	44.4
Cadre active participation						
- lack	4	12.9	13	14.0	17	13.7
- adequate	9	29.0	28	30.1	37	29.8
- good	18	58.1	52	55.9	70	56.5
Cadre hospitality						
- lack	0	0.0	10	10.8	10	8.1
- adequate	9	29.0	20	21.5	29	23.4
- good	22	71.0	63	67.7	85	68.5
Number of the cadres						
- lack	7	22.6	25	26.9	32	25.8
- adequate	19	61.3	51	54.8	70	56.4
- Good	5	16.1	17	18.3	22	17.7

6.5 Roles of the Stakeholders in Improving the Participation of the Mothers of Children under Five to *Posyandu*

The aims of improvement of the community basic health and nutritional status through *Posyandu* can be achieved if there are supports from a variety of parties who are concerned with (stakeholders) *Posyandu*. To what extent the roles of each of the parties from the perception of the rural community can be recognized through a PRA approach with a technique of diagram Venn as created by a small group of the cadres (Picture 6.3).



Picture 6.3 An example of diagram Venn created by the cadres

The result of diagram Venn and an analysis of discussion by the cadres themselves in each village in general showed that the cadres and midwife was the closest persons with the mothers of children under five and their roles were the greatest in encouraging the mothers of children under five to participate and in improving the *Posyandu*. In more details the results are as in the following:

Sukaesmi Village

Stakeholders who were considered to be closer to the mothers of children under five were as follows:

1. The cadres, considered the most important due to their duties in guiding and serving the children under five and the children's mothers in weighing.
2. The midwife, assisting in the examination of pregnant mothers and children under five.
3. The PKK committee, helping the cadres in overcoming the problems appearing in the *Posyandu*.
4. The family planning counsellors, visiting the *Posyandu* to find out the number of the children weighed.
5. The leader of RT, whom the cadres contact to get a permission for the *Posyandu* location.
6. *Puskesmas*, where the children under five of poor nutrition are referred to by the cadres or the midwife.

7. The community figures, playing a role in giving a speech or advice on the importance of visiting *Posyandu*.
8. The village leader.
9. The village secretary.

Sukaluyu Village

Stakeholders who were considered closer to the mothers of children under five were as follows:

1. The cadres, considered important since their duties are to guide and serve the children under five and the children's mothers in weighing.
2. The midwife, assisting in the examination of pregnant mothers and children under five.
3. The traditional midwife, helping explain the importance of delivery by the medical staff.
4. The family planning post, a board coordinating the *Posyandus*. The data available at *Posyandu* are reported to the family planning post.
5. The religious leaders, providing information on the vaccines being 'halal'
6. The nutritional department of *Puskesmas*, a place where the children suffering from poor nutrition were referred to.
7. The wife of the village leader, as a conveyor of a message to the village leader
8. PPL (*Petugas Penyuluh Lapangan*—the Agricultural Extension Workers), providing an elucidation to the community members and the *Posyandu* cadres on the herbs for family.

Sukajaya Village

Stakeholders considered closer with the mothers of children under five were as the following:

1. The cadres, considered to be important for their duties to guide and serve the the children under five and the mothers of the children.
2. The midwife, very important in the examination of the health of the mothers of children under five and their children.

- 3. The leader of the RT, whom the cadres report the matters occurring at *Posyandu* to.
- 4. The wife of the village leader, as a permanent donator of the *Posyandu*.
- 5. The community, the participation of the mothers of children under five in weighing their children to *Posyandu*.
- 6. *Puskesmas*, where the children under five of poo nutrition were referred to.

6.6 Perception of the Formal and Informal Village Leaders on *Posyandu*

The perception of the village leaders, either a formal leader or an informal one, on *Posyandu*, its problems and their solutions was important to know. The perception was based on the result of the FGD which had been done by inviting 11 figures, including the *puskesmas* officer and the village midwife. The results of the discussion generated information which can be seen in Table 6.23 as follows:

Table 6.24 Perception of the formal and informal village community figures on *Posyandu*

<i>Posyandu</i> Problems	According to
The community are less active taking participation.	Sukaresmi Village Head
There is a lack of coordination among the RT head (smallest subvillage), cadres, and the community. Sometimes in the implementation of <i>Posyandu</i> the community wait for the instruction from the RT head to follow <i>Posyandu</i> .	Sukaluyu Village Head
<ul style="list-style-type: none">- <i>Posyandu</i> has not had its own bulding.- The office utensils and <i>Posyandu</i> equipments are unavailable or inadequate- The cadres do not maximally coordinate with the village leader.	Sukajaya Village Head
<ul style="list-style-type: none">- <i>Posyandu</i> needs a special location.- <i>Posyandu</i> equipments are inadequate.- The community are enthusiatic visiting <i>Posyandu</i>.	An informal leader and the head of RT in Sukajaya: Mr. Samsudin and Mr. Anin

Table 6.24 Perception of the formal and informal village community figures on *Posyandu* (cont.)

<i>Posyandu</i> Problems	According to
<ul style="list-style-type: none"> - Rubbish becomes a separate problem. - Coordination of the cadres with the RT/RW is lack. 	A community figure of Sukaresmi Village (Mr. H. Yudi)
<ul style="list-style-type: none"> - There are no bench nor divan for the pregnant mothers. - The religious figure will state a vaccine 'halal' if there is explanation from the health officer first. 	A community figure of Sukaluyu Village (Mr. H. Khamir)
<ul style="list-style-type: none"> - The community members consider that the midwife is the person that is responsible for the <i>Posyandu</i> implementation. - The report books are inadequate. The <i>Posyandu</i> generally has only one registering book. - Recording is in problem, it is incomplete. - There is a doubt from the community on the vaccines for the immunization. 	The midwife of Sukaluyu Village (Ms. Yati)
<ul style="list-style-type: none"> - The village community think <i>Posyandu</i> is just owned by Puskesmas. - The number of KMS is limited, and the time for supply of KMS to Puskesmas cannot be predicted. 	The head of <i>Puskesmas</i> (drg. Ulfa)
<ul style="list-style-type: none"> - There is a lack of coordination from the community. - The community members having children under five of poor nutrition feel ashamed to get their children weighed. 	The midwife of Sukaresmi Village (Ms. Lisna)
<ul style="list-style-type: none"> - The recording in the registering book is not in order. - The cadres do not report the recapitulation monthly. - The recording books are not complete, there should be 12 but only one book is used. 	The midwife of Sukajaya Village

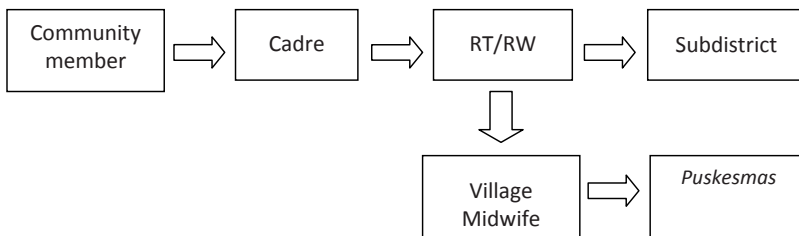
Based on the *Posyandu* problems described above, it was drawn conclusions of the problems formulated by the participants as follows:

1. There was a problematic communication among the stakeholders of *Posyandu*, either between the cadres and the village organizers, the midwife and the cadres, the cadres and the community, the midwife and the community, or between the village organizers and the community.

2. The *Posyandu* facilities were still limited.
3. The human resources among the stakeholders at the *Posyandu* that were still necessary to be improved were especially the cadres.
4. The problems at the *puskesmas* level was the availability of KMS which had not been adequate.

Further the problems were discussed again to find their solutions, and here are the formulation as follows:

1. Building a good coordination among the stakeholders available at the *Posyandu*.
 - The cadres must report the *Posyandu* matters to the RT/RW leader.
 - The cadres have to improve the recording of the registration at *Posyandu*.
 - The cadres have to coordinate with the village midwife.
 - The community members have to communicate with the cadres and the head of the RT/RW.



Picture 6.4 A reporting system flowchart

2. Building the *Posyandu* building (not solved)

The village party is able to provide land but it is hindered by the fund for building it, whereas the *puskesmas* does not have any fund for establishing a *Posyandu* building.
3. Human Resources
 - Cadre trainings should be held by the *puskesmas* every two months with the financial source from two villages.
 - The cadres are more intensively trained and continuously accompanied.

4. Roles of the religious figures in explaining the being *halal* of the vaccines
 - Firstly, the medical officer explains the being *halal* and usefulness of the vaccines to the religious figures, and then the religious figures pass this to the community.

6.7 Facilitating *Posyandu*

To know the *Posyandu* equipments needed, an interview to the cadres was conducted on the kinds of equipments possessed by the *Posyandu*. The results of the interview showed that the kinds of *Posyandu* equipments available in the control area consisted of a portable scale, microtoise, body height/body length tape-measure, UAC (upper arm circumference) tape-measure, nutritional and health books, as well as reverse sheet, and the number for each of them was one. Other equipments whose number was greater were tables (2), posters (three), and rubbish bins (2). At the *Posyandu* in the control area not all of the equipments were owned by the *Posyandu*. The observation results at the *Posyandus* in the intervention area showed that the kinds of equipments possessed by some of the *Posyandu* were portable balanced scale, chair, finger step scale, microtoise, UAC tape-measure, a box of medicines for sudden illness or injury, and leaflet; the number for each of them was one. Other kinds of equipments were tables, nutritional and health books, and poster; the number for each of them was three. The kinds of equipments whose numbers were relatively many were reverse sheets and modules and manuals for *Posyandu* cadres.

According to the opinion of the cadres in the control area, the kinds of equipments which were necessary to be increased were tables, chairs, nutritional and health books, magazines, tabloid, poster, leaflet, model/sample of foods, and reverse sheets. According to the cadres from the intervention group, in addition to nutritional and health books, magazines, tabloid, poster, model/sample of foods, and leaflet, the kinds of equipments whose number needed to be increased were module, BH and BW measure, UAC tape-measure, blood pressure measuring equipment, box of medicines for sudden illness and injury, rubbish bin, handwashing basin, and cupboard/bookshelves.

Based on the data, the intervention which was done to help complete the *Posyandu* equipments in the intervention group was by giving some aids, among others, were scale, UAC tape-measure, portable balanced scale, baby scale, poster, leaflet and modules of nutrition and health.

Table 6.25 Equipments owned by the *Posyandu*'s

No	Name of equipments	Control			Intervention		
		Number		The ideal one by the cadre	Number		The ideal one by the cadre
		Min	Max		Min	Max	
1	Portable balanced scale	1	1	1	0	1	3
2	Table	2	2	3	0	3	6
3	Chair	0	0	5	0	1	6
4	Digital step scale	0	0	0	0	0	2
5	Finger step scale	0	0	1	0	1	2
6	Baby scale	0	0	1	0	0	2
7	Microtoise	1	1	1	0	1	3
8	BH/BL tape-measure	1	1	0	0	0	3
9	UAC tape-measure	1	1	0	0	1	2
10	Blood pressure measuring instrument	0	0	1	0	0	3
11	Box of medicines for sudden illness or injury	0	0	1	0	1	3
12	Nutritional & health books	1	1	5	0	3	14
13	Manuals for cadres	0	0	5	0	17	18
14	Magazine, tabloid	0	0	20	0	0	10
15	Poster	3	3	10	0	3	12
16	Leaflet	0	0	20	0	1	10
17	Reverse sheet	1	1	5	0	5	5
18	Module	0	0	0	0	5	6
19	Rubbish bin	2	2	2	0	0	3
20	Hand-washing basin	0	0	1	0	0	3
21	Cupboard/bookshelves	0	0	1	0	0	3
22	Model/sample of food	0	0	5	0	0	6
23	Divan/mattress	0	0	1	0	0	2

7

Home Gardening

7.1 Ownership and Utilization of the Yard

Yard is an area around the house, having a clear border and owner, able to be planted various kinds of plants or as a place to raise various kind of animals and fish. A yard can also be utilized to fulfill the nutritional household needs and increase the household income. In regard to its size, a yard can be classified into a narrow yard, <120 m², a medium yard, 120–400 m², a wide yard, 400–1000 m², and a very wide yard, >1000 m² (Arifin *et al.* 2009).

Prior to the implementation of the home gardening program, a preliminary observation was carried out to know the width, interest towards kinds of plants/cattles which would be developed, equipments/facilities needed, forms of respondents' yard utilization, and to get an illustration of their vegetable-planting practice as well as the stages of cultivation which had not been understood or difficult.

Table 7.1 Statistics of the land width (m²)

Land (m ²)	Control	Intervention	Total
Yard			
- Self-owned	21.0 ± 33.9	19.2 ± 50.0	19.7 ± 47.1
- Not self-owned	4.5 ± 18.0	12.5 ± 64.2	10.5 ± 57.3
Rice field			
- Self-owned	0.0 ± 0.0	145.6 ± 432.5	109.2 ± 395.0
- Not self-owned	3.2 ± 18.0	95.5 ± 338.2	72.2 ± 297.6
Garden/dry land			
- Self-owned	15.7 ± 59.9	31.5 ± 114.0	2.6 ± 103.8
- Not self-owned	108.7 ± 420.8	56.4 ± 319.6	69.5 ± 348.3
Fishpond			
- Self-owned	0.8 ± 2.8	0.6 ± 3.3	0.6 ± 3.2
- Not self-owned	0.0 ± 0.0	0.9 ± 6.1	0.7 ± 5.4

The types of land under the control of the households of children under five consisted of yards, ricefield, garden/dry land, and fishpond. The lands were self-owned and not self-owned. From the width, the ricefield was the widest land followed by garden/dry land, yard, and fishpond. In total the intervention group took control over wider lands than the control group. On average the control group and the intervention one owned small yards (<120 m²). The average land size under control of the intervention group was approximately 32 m² per household, with the details as follows: in Village Sukaresmi 44.1 m², Village Sukaluyu 23.6 m² and Village Sukajaya 11.9 m². The average width of the yards of the intervention group was 7 m² wider than that of the control group, which was 25 m² per household. The variety of land widths under control of the households in the intervention group and in the control group was very high. This showed that there was households having very wide land and there were the households which did not have any land or have some land but its width was very small.

Table 7.2 Utilization of the yard areas (baseline)

Kinds of plants	Control (n=31)		Intervention (n=93)	
	n	%	n	%
Vegetables	6	19.4	28	30.1
Tubers	4	12.9	24	25.8
Decorative plants	8	25.8	22	23.7
Others	5	16.1	9	9.7

The yards in the control group and in the intervention one had not been optimally utilized, even most of the yards had not been utilized or deserted. The low utilization was because the households did not have seeds/seedlings of plants, did not have time and were occupied managing the house and children, did not know the way to plant, and other various reasons. Based on the baseline, there was different utilizations of the yard areas between the intervention group and the control one. Less than one-third of the intervention group participants utilized their yards to plant vegetables (30.1%), tubers (25.8%), decorative plants (23.7%), and others. Whereas, less than one-fourth of the households of children under five in the control group utilized their yards for decorative plants (25.8%), vegetables (19.4%), tubers (12.9%), and others. The households in the intervention group planting plants were 10% higher than those in the control group.

The results of an AVRDC research (1993) showed that a yard of 16 m² wide was potential in the fulfillment of nutrient adequacy in a day (iron and calcium as much as 40%, vitamin A 80% and vitamin C 100%) for a five-person household. The utilization of a narrow yard (<200 m²) could reduce the household food expenditure up to 9.9%, and could contribute in the provision of vitamin A (2.4%) and vitamin C (23.6%) sources (Arifin *et al.* 2012). In Bangladesh, households having food plants (crops) in their own yard consumed vegetables per capita higher and the consumption increased significantly compared with that of the households which did not have any crops in their own yard (AVRDC 1994).

7.2 Implementation of the Home Gardening Program

The implementation of the yard utilization program (the home gardening program) was begun by a program socialization to the respondents, and continued by a preliminary observation on the yard utilization to determine the kinds of plants which would be developed in the three intervention villages. The kinds of plants which were developed were *katuk* (a kind of leafy vegetable), spinach, *kangkung* (a kind of leafy vegetable usually growing in water), *caisin* (a kind of leafy vegetable, mustard greens), *pakcoy* (chinese cabbage), *pare* (bitter melon), bean, cucumber, eggplant, and string bean. The spice plants included *cabai rawit* (very hot small-sized chilli), *cabai keriting* (long curly chilli), tomato, ginger, tumeric, *kencur* (a root crop resembling ginger), and herbs including *kumis kucing* (a kind of plant whose leaves have diuretic properties), *binahong* (a kind of bitter leafy plant), *ki saat* (*valeriana officinalis*, a kind of leafy plant), *temulawak* (a kind of wild ginger of yellow colour), *temuputih* (a kind of ginger) as well as other herbs available in those areas.

Based on the interest of the respondents, there are 11 kinds of plants which were selected to be cultivated in their yards in order of priority as follows: tomato, *cabai keriting*, ginger, purple eggplant, spinach, green *pare*, running bean, *caisin*, *pakcoy*, bean, and *kangkung*.

Table 7.3 The width of home gardening areas through the IPB Program
(endline)

Treatment	Land width (m ²)
Control	30.32 ± 89.57
Intervention	23.20 ± 43.84

The program implementation in the three intervention villages was started in the second week of April 2012, with an average planted land which was utilized by the intervention group of approximately 23 m². The utilization of the yards in the intervention villages was lower compared with that in the control group, that is, approximately 30 m². However, the variety of land widths of both intervention were very high, that is, almost twice as the average. This indicated that both of the averages relatively did not have any difference, and each had an exclusion.

The implementation of the home gardening program included five stages, that is (1) making demplots in each village as a model location for the respondents in practicing a plant cultivation, (2) practicing to make a plant nursery using a tray with media born husk and *bokashi* (The kinds of plants which were germinated were all, whereas spinach, *kangkung*, string bean, and bean were not because the seeds of these plants were directly planted in the land areas. Besides that, paranet was used to reduce the sunlight intensity or a heavy rain.), (3) planting preparation, including making verticulture racks to plant in a narrow area, making fences, tilling land, distributing *bokashi* fertilizer and polybag as well as distributing seedlings from the demplot location, (4) practicing to make liquid fertilizer as one of the efforts to fulfill the plant nutrition by utilizing local materials which are safe for food consumption, and the last stage (5) planting.

A brief questionnaire was administered to each of the respondents to get an illustration on the habbit of planting vegetables as well as the cultivation stage which had not been known or difficult. The result of the observation toward the respondents in Villages of Sukaresmi and Sukajaya showed that 51% of the respondents had been accustomed to planting vegetables or planting other crops in a garden or ricefield, particularly among the respondents who were > 30 years old, while among the young respondents activities of plant cultivation were not commonly done. The cultivation stages which had not been understood by the respondents were the stages of media selection (39%), tending (34%), fertilizing (17%), and planting (10%).

The understanding level of the respondents on the cultivation stages, such as media selection, tending, fertilizing, and planting was still low. Therefore, a technique of *melarung* (mixing) was introduced to the respondents as one way of utilizing the yard waste to be compost practically. The procedures are put soil and organic waste in layers into a sack, add barn yard manure if there is, let it for 2 weeks to one month, and then it can be used as planting media for vegetables. Even though it was not applied by all of the respondent, the *melarung* technique had been started to be utilized, in addition to the utilization of polybag, second-hand bucket, or other planting pots.

Techniques of germination and making liquid fertilizer had been understood by most (70%) of the respondents, but in the field liquid fertilizer had not been maximally applied. Based on the information from the demplot respondents, the members had understood the usefulness of liquid fertilizer but they rarely took the liquid fertilizer with a reason of being occupied or far; in fact, it had been prepared in three locations in each of the villages. Accordingly, it needed further guidance connected with the usefulness of liquid fertilizer for plants to the respondents.

The verticulture technique had been understood by 60% of the respondents, in the narrow yard it had been applied, that is, in a form of multistorey bamboo racks. However, the weakness of bamboo was its technical age which could be easily perishable so it would last longer if we used iron sheets. On the period of fulfillment of the facilities and infrastructure to the respondents at the second stage, bamboo was only prioritized to make fences and selves, while for verticulture, particularly for the demplot respondents was prioritized with the fulfillment of iron sheets as planting media and hanging pots.



Picture 7.1 Verticulture technique

There were relatively many kinds of vegetables which were planted by the intervention group. There were 15 kinds of vegetables which were planted, namely, small-sized hot chilli, *katuk*, spinach, *kangkung*, running beans, etc. The kind of plants which were difficult to cultivate were eggplants, bitter melon, tomato, and chilli, while the kinds of plants which were easy to be planted were spinach, *kangkung*, and *caisin*. The difficulty was particularly concerning with tending because it needed a more intensive compared with leafy plants. However, with guidance in the field, the plants of eggplants, chilli, tomato, and bitter melon supported the harvest very much because the productive period was relatively the same. Most of the respondents felt happy with this home gardening program because they got guidance, direction, and facilities and infrastructure which are adequate.



Picture 7.2 Housing of seeds

The plants which were ready to be planted for the first time from the nursery were *caisin* and *pakcoy*, and followed by other plants. Whereas, plants of spinach, *kangkung*, string bean, and bean had been distributed at the end of April 2012 so they had begun being planted by the respondents in the first week of May, and among several of the respondents they had been harvested in the week of June. Spinach, *kangkung*, *caisin*, and *pakcoy* had begun being harvested in the fourth week of May up to the second week of June.

During the period of April 2012 to June 2013 the highest production was *caisin* in Sukaresmi (about 150 kg), tomato in Sukaluyu (about 155 kg), and in Sukajaya (about 100 kg). Other vegetables whose production was categorized high were spinach, cucumber, bitter melon, *kangkung*, chilli, and eggplant. The vegetables whose production was high indicated that the vegetables were suitable to be planted in the yard and potential to be recommended to the other household to plant them.

In the period of April–June 2012, the plant which was harvested in a large quantity were spinach in Sukaresmi, as many as 44.29 kg, Sukaluyu 61.84 kg, and Sukajaya 9.59 kg. Whereas, in the period of Juli–September 2012 the plants which was harvested in a large quantity was tomato, in Sukaresmi as much as 42.15 kg, Sukaluyu 93.98 kg, and Sukajaya 69.06 kg. Most of the harvests were consumed by the respondents themselves and the rest were given to their neighbours. There were some respondents who sold their harvest to the stall because they planted in a relatively wide area so their harvests were abundant.

Table 7.4 Data of the harvest in the period of April 2012 to June 2013 in Sukaluyu Village

Kinds of commodity	Harvests (kg) per commodity per period in Sukaluyu Village					Total
	Apr–Jun 2012	Jul–Sep 2012	Oct–Dec 2012	Jan–Mar 2013	Apr–Jun 2013	
Small-sized chilli	-	0.53	0.53	21.85	29.95	52.85
<i>Katuk</i>	0.90	0.30	-	3.00	7.75	11.95
<i>Kumis kucing</i>	-	-	-	-	3.10	3.10
Spinach	61.84	21.11	0.50	1.50	58.15	143.10
<i>Kangkung</i>	49.31	17.31	0.88	10.00	60.40	137.90
String bean	21.75	8.50	1.25	9.00	15.00	55.50
<i>Caisin</i>	36.08	15.23	3.20	12.25	36.00	102.76
Cucumber	-	2.00	2.00	1.00	18.75	23.75
Eggplant	2.81	0.94	-	21.00	22.75	47.50
Tomato	11.12	93.98	19.28	7.25	23.00	154.62
Chilli	0.19	2.91	2.85	23.50	28.45	57.90
Bitter melon	6.38	8.75	6.63	2.75	14.20	38.70
Bean	11.06	3.69	-	-	-	14.75
Salad eggplant	-	6.63	6.63	4.00	15.00	32.25
<i>Packoy</i>	13.73	-	-	-	5.45	19.18
Total	215.17	181.87	43.73	117.10	337.95	895.81

The trends of the total vegetable harvests in the three intervention villages were of nearly similar patterns. In the period of April–September 2012 the harvest increased, then in October to December 2012 decreased, and in January–June 2013 the harvests increased again. In August to October 2012 the condition of the respondents' yards was in alarm due to the drought impact. The lack of water in the three intervention village affected the development of the yard areas very much because the water sources were reduced. The respondents' priority was the daily water fulfillment for bathing, washing and toilet needs so the yard areas did not get enough water supplies. With this condition the respondents were unable to plant the vegetables seedlings, particularly the leafy plants such as spinach, *caisin*, pakcoy, and *kangkung*. The plants which could be maintained by some of the respondents were eggplant, tomato, chilli, and bitter melon. The guiding priority during the dry season was emphasized on the improvement of motivation to maintain the spirit of the respondents to keep on looking after their yards.



Picture 7.3 Vegetable harvests

The plants in the home gardening areas of the respondents began to look green again in the mid of October 2012 in line with the come of the rainy seasons. The seeds and seedlings which had been prepared began to be planted again. Besides that, in each of the villages were formed six home gardening areas as models (demplot), where the three locations represented the narrow yards, and the other three represented the wide ones. The facilities and infrastructure including bamboo, gutters, polybags, pots, seeds, and seedlings were fulfilled by the program according to the arrangement and needs of the yards. The criteria of the respondents selected as demplots were their yards were well taken care so far, there was a commitment to develop the program and obtained a support from their husbands. Up to now, the demplot locations were continuously cleaned up, in line with the fulfillment of increasingly various plants.

The planting areas were not positively correlated with the average width of the yards owned by the respondents. For example in Sukaresmi the average yard width was the largest in the field, but in fact most of the respondents belonged to having a narrow yard. The width value on average was high because there were one or two respondents who possessed the widest yard (the case of Mrs. Iis' yard was approximately 400 square meter, in a form of a decorative-plant garden). The calculation of planting area data became difficult to be obtained in the field since the respondents might place polybags around their house or hang gutters or bamboo shelves on the fences of other places so the calculation would approach the real width if the approach used was the number of seedlings or plants which were taken care of. However, this would also be difficult because in each month there might be changes so the data of the planting areas became impermanent. Regardless of the barriers, the data of the harvest were expected to be able to provide a description on the productivity of the yard areas (which generally belonged to narrow yards).

Table 7.5 Data of the harvests in the period of April 2012–June 2013 in Sukaresmi Village

Types of commodity	Harvest (kg) per commodity per period in Sukaresmi Village					Total
	Apr–Jun 2012	Jul–Sept 2012	Oct–Dec 2012	Jan–Mar 2013	Apr–Jun 2013	
Small-sized chilli	0.08	2.93	7.55	14.43	16.80	41.78
<i>Katuk</i>	1.69	3.16	2.10	7.80	9.30	24.05
<i>Kumis kucing</i>	0.68	0.23	1.00	5.55	20.35	27.80
Spinach	44.29	19.76	1.45	48.30	34.25	148.05
<i>Kangkung</i>	15.75	10.50	8.55	22.25	25.35	82.40
String bean	0.45	1.90	1.55	12.00	31.40	47.30
<i>Caisin</i>	22.28	15.28	4.40	49.60	58.25	149.80
Cucumber	6.60	6.70	15.00	4.80	69.70	102.80
Eggplant	2.00	10.00	11.45	11.00	3.25	37.70
Tomato	4.65	42.15	5.85	14.15	23.35	90.15
Chilli	0.11	18.69	5.65	5.80	1.05	31.30
Bitter melon	10.91	12.39	9.60	7.55	17.85	58.30
Bean	4.65	2.55	3.75	-	9.50	20.45
Salad eggplant	1.68	2.23	3.00	-	-	6.91
<i>Packoy</i>	2.40	0.90	-	10.70	8.95	22.95
Total	118.21	149.36	80.90	213.93	329.35	891.74

The plants in the areas of the yards had been able to be harvested since May 2012. The harvests could increase and decrease in line with the weather condition in the field as well as the level of the respondents' participation. The harvests in the three respondent villages reached 1 ton (exactly 1044 kgs), where the harvest in Sukaresmi were 348.47 kgs, Sukaluyu 440.77 kgs, and in Sukajaya 255.3 kgs. The plants which largely contributed to the harvest were tomato, spinach, *caisin*, and *kangkung*. The harvests in every quarter showed an increase, except in Sukaluyu there was a slight decrease. However, in total the harvests in this village remained the top compared with those of the other two villages.

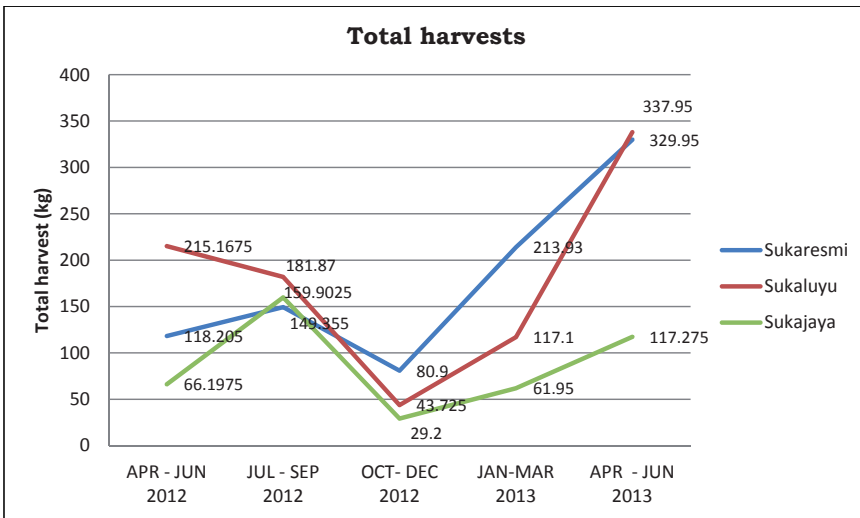
Table 7.6 Data of the harvest in the period of April 2012 to June 2013 in Sukajaya Village

Kinds of commodity	Harvests (kg) per commodity per period in Sukajaya Village					Total
	Apr-Jun 2012	Jul-Sept 2012	Oct-Dec 2012	Jan-Mar 2013	Apr-Jun 2013	
Small-sized chilli	0.08	5.00	2.45	7.85	6.25	21.62
<i>Katuk</i>	0.38	0.80	0.40	1.75	4.68	8.00
<i>Kumis kucing</i>	-	-	-	8.00	-	8.00
Spinach	9.59	3.61	1.78	2.55	3.25	20.78
<i>Kangkung</i>	12.91	7.79	0.98	8.25	17.48	47.40
String bean	6.04	6.01	-	0.45	2.50	15.00
<i>Caisin</i>	20.31	8.86	1.53	4.95	1.60	37.25
Cucumber	-	4.28	1.93	-	31.23	37.43
Eggplants	1.99	27.31	11.45	5.40	4.83	50.98
Tomato	8.12	69.06	2.45	4.95	15.63	100.21
Chilli	0.35	5.24	1.98	1.50	0.25	9.32
Bitter melon	4.15	13.36	1.53	14.85	13.95	47.83
Bean	0.38	0.58	0.25	-	0.50	1.70
Salad eggplant	0.94	8.01	2.50	1.45	1.05	13.95
<i>Packoy</i>	0.98	-	-	-	14.10	15.08
Total	66.20	159.90	29.20	61.95	117.28	434.53

The increasingly high rainfall in October to December 2012 at the beginning made the plants become green again after the dry season however the the continuous rainfall increase (the rainy season) caused the decrease of the

harvests to the lowest quantity but then they increased. The high rainfall made some plants die, such as chilli, and the production of other plants decreased.

The trend of the harvests showed that the harvests in Sukaresmi were almost always the highest followed by those in Sukaluyu and the lowest ones were in Sukajaya. The harvests in Sukajaya were at the lowest position because the yard areas under the respondents' control were small. In the end of the intervention period, that is, April to June 2013, the harvests were almost three times of the harvests in the early period of the program, that is, April–June 2012. This showed that awareness to till land for growing vegetables was very good so it was expected that this home gardening program should be sustained independently.



Picture 7.4 The harvests of the yard crops

The roles of the cadres in the home gardening program helped very much in the field. This was connected with some efforts to maintain or build the motivation of the respondents. Most of the cadres in the three villages were enthusiastic towards the program sustainability even though in its course there were several of the cadres who were less active in the field because of their activities or other things. The cadres who were very responsive in Sukaresmi so far were Mrs. Titin, Mrs. Irma, and Mrs. Iis, while in Sukajaya were Mrs. Hasanah and Mrs. Fatimah, where the form of their support could be seen in the yard management which was interesting and well taken care.

The participation level of the respondents was in general good, but in each of the villages there were some respondents who were less cooperative, such as in Sukaresmi from the beginning of the program up to now there were four respondents who never harvested their crops. They managed their yards as they were and were not active when there was a meeting. After a personal approach done to them, in fact their complaint was in general due to a lack of supports from their husbands. Besides that, there was also a respondent whose harvests were not maximum or her yard was not taken care. The case, according to the opinion of the local cadres, was because the respondent was actually lazy. Qualitatively, supports from the husbands, time allocation, and respondents as well as their household members' wish were factors affecting the yard utilization.



Picture 7.5 Home gardening

AVRDC (1995) states that home gardening depends on (1) the available manpower at home, (2) the availability of areas around the house, (3) the availability of a simple gardening technology or tools, (4) the availability of seedlings and water, and (5) interest or motivation. Even though its usefulness in the fulfillment of the household nutrition is limited, a vegetable produce is able to increase the income compared with other kinds of crops if the vegetable grows in the right season and the farmer possesses a good management ability.

The manpower available at home was wife and husband. When the wife looked after their children, the husband was a worker who was able to contribute significantly to the yard management. Supports from the husband were factors affecting the success of an optimal yard utilization in the intervention group. For example, Mrs. Siti Umriah was 37 years old, who is from Sukaluyu. At the time of the collection of the baseline, her yard was only utilized to plant

trees which had grown since a long time ago and had never been utilized for vegetables. At the beginning she did not respond to this home gardening program since she was occupied looking after their children and her health condition was not good. Whereas, her husband welcomed this program enthusiastically for her husband loved gardening, he was able to plant and accustomed to growing plants available so for cultivation and taking care of plants there was no obstacle. The harvests were consumed for themselves and sent to their neighbours. Her husband supported and even played a significant role in this program. Mrs. Siti's husband stated that he was pleased with this program even though he was a little bit occupied, when the harvest came and could shared with his neighbours his being occupied was paid. Even though the respondent did not respond, her husband was very enthusiastic and wished this program able to keep on going.

The respondent who got less support from her husband, for example, was Mrs. Juju (18 years) from Sukaluyu. Due to the absence of her husband's support made the respondent feel a little bit burden and could not do all by herself. The respondent was busy looking after her child, had a difficulty to get water to water the plants, many attacks from poultries (ducks and chickens), coupled with the narrow land and it had never been utilized, and the respondent could not plant and was not accustomed to growing plants.

Interest and motivation from the respondents and accompanied by a full support from their husbands were able to maximize the utilization of narrow yard areas, and this could become a model for the other respondents. For example, Mrs. Hasanah was 29 years old from Sukajaya and Mrs. Encih (37 years) from Sukaresmi. Mrs. Hasanah was a cadre who was active in assisting activities in the field, her husband was also supported very much in making facilities such as fences, shelves, arrangement and cultivation. Both of them belonged to a harmonious couple. Even though their yard area was very narrow, they were able to arrange it attractively and make it fertilized so that it could reduce their daily kitchen expenditure. The harvests which were obtained were consumed by themselves and sent to their neighbours who needed them. Their expectation put forward was that the respondents should continuously be visited and the program could keep on going because it was useful for the households and community. In addition, Mrs. Encih and Mr. Acun (40 years) from Sukaresmi were also a couple of husband and wife, who since the beginning of this program seemed to be enthusiastic and harmonious, and stated that previously their available yard was only planted

as it was, and according to them even though they were used to gardening, they did not have any idea what had to be planted in their yard and where they could get the seeds/seedlings. Accordingly, they did not mind when a part of their yard was built a nursery garden for the community, and they were as the ones in charge of the garden.

The time allocation of the respondents or the husbands' respondents was the supporting factor of the yard utilization success as expressed by Mrs. Erna (28 years) from Sukajaya. The respondent stated that she was used to growing plants but she did not have time to take care of the plants. The respondent was busy selling while her husband was busy working in ricefields. In fact, this program, according to her, was very useful because there was something which could be expected, that is, the harvest but at that time she was still unable to manage her time.

Interest and motivation were other factors which influenced the yard area utilization. When one does not have any interest or motivation, it will be difficult to utilize her/his yard area at her/his optimum because the yard needs to be taken care in order to produce continually. For example, Mrs. Heni (22 years) from Sukaesmi stated that the narrow yard made the product not maximum. After a personal approach by the cadres or an officer to manage her yard, the respondent often stated that she would ask her husband's opinion first, or her husband was unable to help and other reasons. According to the local cadres, the respondents did not have activities except looking after her child who was just one and big enough. A lack of motivation to improve the yard utilization made the respondent inactive and not enthusiastic in conducting this home gardening program so the result of the production was also not optimum.

The benefits of this program were in forms of the decreasing expenditure for vegetables and the increase of the knowledge as expressed by a couple of husband and wife, Mrs. Encih and Mr. Acun. Mrs Encih stated that she had to buy chilli but then she did not have to, she had to buy tomato but then she did not have to, she had to buy eggplant but then she did not have to, even she was also able to give some vegetables to her neighbour; and the money that should be used to buy chilli could be used for her children's pocketmoney or to buy other kitchen needs; if there were vegetables in the yard, their money could stretch and it was not gone; as when she bought vegetables in a stall, the money was directly gone. Mr. Acun added that after the yard had many

plants he felt happy because when he did not work in a shoe repair shop, he had an activity at home, helping making fences, shelves, tidying and looking after the plants; his knowledge increased—previously he did not know herbs, he then knew it. In addition the couple also stated that he became to know the way to germinate seeds in a tray, to make a liquid fertilizer, and his knowledge on nutrition for children also increased; in short all were useful, furthermore he had been supplied with the facilities and seeds/seedlings; he thanked very much and expected this program to keep on going because it was very useful for the people like them.

8

Nutritional Knowledge, Attitude, and Behaviour of the Cadres and the Mothers of Children under Five

8.1 Nutritional Knowledge

Mothers. Nutritional knowledge becomes an essential foundation that leads to a good nutritional attitude and behaviour. Basically individuals with a good nutritional knowledge will possess a better understanding in selecting foods for their whole household members' consumption. Whether hindered by economic matters or not, mothers with a good nutritional knowledge will try to get nutritious foods of good quality so that the nutrition adequacy of their household members, particularly for their children, can be met. Suhardjo (1989) states that mothers have a significant role in their household. The mothers in Indonesia are responsible for buying foods, arranging the household menus, distributing foods, being directly involved in taking care of the children. Therefore, the mothers' nutritional knowledge significantly affects the nutritional status of the households. This is supported by a study conducted by Khotimah *et al.* (2012) on the correlation between mothers' nutritional knowledge as well as the food patterns of the children under five and the nutritional status of the children under five (12–59 months) in the working areas of *Puskesmas Gandus*, Subdistrict Gandus-Palembang, which found that there was a significant correlation between the nutritional knowledge level of the mothers and the nutritional status of children under five.

In this research, the assessment of the nutritional knowledge was administered to the intervention group and to the control one. During the intervention (five meetings of nutritional extension), a pre and posttest of nutritional knowledge was administered. For each meeting of the nutritional extension as many as 10 items of the nutritional knowledge were asked to the mothers. The scores of pre and posttest in the intervention group became a baseline and endline data. The objective of a nutritional extension, according to Kodyat (1993) is to allow a process of knowledge, attitude and behavior changes to occur, that is, to be a better attitude on usefulness of the various kinds of foods available and a healthier behaviour of utilizing them.

Table 8.1 shows the categories of the nutritional knowledge of the control group and the intervention one. In the control group, most of the mothers (58.1% of the baseline and 67.7% of the endline) possessed a nutritional knowledge categorized as 'moderate'. As it was the case in the intervention group, many of the mothers (67.0% of the baseline and 51.6% of the endline) possessed a nutritional knowledge categorized as 'moderate'. The trend of the increasing nutritional knowledge appeared in the intervention group, where the category of 'good' increased, that is, from 3.3% (baseline) to 35.5% (endline) and the category of 'lack' decreased, that is, from 29.7% (baseline) to 12.9% (endline).

Table 8.1 Categories of nutritional knowledge of the mothers

Categories of nutritional knowledge	Control				Intervention			
	Baseline		Endline		Baseline		Endline	
		%	n	%	n	%	n	%
Good (>80%)	4	12.9	3	9.7	3	3.3	33	35.5
Moderate (60–80%)	18	58.1	21	67.7	61	67.0	48	51.6
Poor (<60%)	9	29.0	7	22.6	27	29.7	12	12.9
Mean±Std (score)	64.7 ± 16.8		66.5 ±15.9		62.0 ±12.9		74.4 ±15.1	
Difference (score)	1.8 ± 8.9				12.4 ±10.2			
t-test (p value)	0.000							

On average the score of the nutritional knowledge in the control group was 64.7 (baseline) and 66.5 (endline), increasing 1.8 in the end score. In the intervention group there was also an increase in the nutritional knowledge score, that is, from 62.0 (baseline) to 74.4 (endline) or an increase of as much as 12.4. The increase of the nutritional knowledge score in the intervention

group was significantly higher than that in the control group ($p < 0.05$). The results of the nutritional knowledge test in details can be seen in Appendix 1.

Cadres. Cadres were the spearhead of the *Posyandu* program implementation in villages. The cadres worked voluntarily without any payment or were paid with a very small incentive. Considering that in general the cadres were of low education, we understand that they also had an economic status of their household similar to that of the community nearby. It was only their genuine intention to help others that made the cadres remained willing to carry on their duty in implementing the *Posyandu* program.

The cadres possessed slightly better nutritional knowledge than the *Posyandu* mother members. Some of them had joined a nutritional/health training. In addition, their interaction with the medical staff was more intense so their access to nutritional/health information became easier.

Table 8.2 shows that in the control group the number of the cadres who had a good nutritional knowledge was 50.0% at the baseline and the number remained 50.0% at the endline. Likewise, the number of the cadres with a moderate nutritional knowledge did not increase from the baseline to the endline. Conversely, in the intervention group, the number of the cadres with a good nutritional knowledge increased from 14.3% (baseline) to 78.6% (endline).

Table 8.2 Categories of the cadres nutritional knowledge

Categories of nutritional knowledge	Control				Intervention			
	Baseline		Endline		Baseline		Endline	
	n	%	n	%	n	%	n	%
Good (>80%)	2	50.0	2	50.0	2	14.3	11	78.6
Moderate (60–80%)	2	50.0	2	50.0	10	71.4	2	14.3
Poor (<60%)	0	0.0	0	0.0	2	14.3	1	7.1
Mean ± Std (score)	77.5 ± 7.9		73.5 ± 13.6		69.6 ± 9.9		84.6 ± 12.8	
Difference (score)	-4.0 ± 12.7				14.9 ± 6.9			
Mann Whitney test (p value)	0.007							

In regard to the average score of the nutritional knowledge, it can be seen that there was a score decrease from 77.5 (baseline) to 73.5 (endline) in the control group. On the other hand, in the intervention group there was a

The nutritional extension conducted in this research gave a great benefit in increasing the nutritional knowledge of both the mothers and the cadres. Therefore, the nutritional extension in the *Posyandu* program must be done continuously in every *Posyandu* implementation. Besides that, nutritional trainings for the *Posyandu* cadres are necessary to be conducted by the Health Department so the cadres gain an easy access on the nutritional information.

Mothers. Nutritional attitude is one's tendency to respond positively or negatively towards a statement connected with nutrition. The nutritional attitude is an accumulation of nutritional understanding and also other factors so they affect one to determine a response towards a nutritional statement.

Table 8.3 Categories of the mothers' nutritional attitude

[illegible]

The average score of the nutritional attitude in the control group decreased 1.0, that is, from 80.7 (baseline) to 79.7 (endline), while in the intervention group the average score increased 6.9, that is, from 75.3 (baseline) to 82.6 (endline). The result of the t-test showed that there was a significant difference ($p < 0.05$) in the scores of the nutritional attitude between the control group and the intervention one.

Table 8.4 Distribution of the mothers by statement of the nutritional attitude

Statements of nutritional attitude	Control				Intervention			
	Baseline		Endline		Baseline		Endline	
	n	%	n	%	n	%	n	%
1. I will provide vegetables daily for consumption of my household.	31	100.0	30	100.0	86	92.5	85	93.4
2. My child had better drink powdered/liquid milk than sweet condensed milk	24	77.4	12	40.0	55	59.1	58	63.7
3. Providing nutritious sidedishes is important for my child	31	100.0	29	96.7	86	92.5	85	93.4
4. I disagree that a child does not need to consume meat because its price is expensive	13	41.9	20	66.7	46	49.5	51	56.0
5. I disagree that a child of 2–3 months may be given banana in order not to be fussy	14	45.2	13	43.3	38	40.9	61	67.0
6. Children must have breakfast everyday to be energetic in their activity	31	100.0	30	100.0	91	97.8	89	97.8
7. I disagree that exclusive breastmilk is given to children up to three months old	16	51.6	20	66.7	43	46.2	61	67.0
8. Drinking milk is important for children to strengthen their bones and teeth	31	100.0	30	100.0	92	98.9	89	97.8
9. Streetfoods, such as <i>ciki</i> , is not good for children	22	71.0	26	86.7	60	64.5	72	79.1
10. Boiled vegetables are safer than raw vegetables/salad	30	96.8	22	73.3	81	87.1	77	84.6

From Table 8.4 it was known that in general the mothers agreed the importance of vegetable consumption for their household members. Vegetable consumption as a source of vitamins, minerals, and fibres must be a part of a healthy life style. Therefore, inciting to eat vegetable needs to be done continuously.

On the statement of 'drinking milk', some of the mothers had an attitude that drinking powdered/liquid milk was better than drinking sweet condensed milk. However, since the price of the sweet condensed milk was cheaper, there were still many of the mothers who agreed that their children drank sweet condensed milk. In addition, besides that, for some of the Indonesian community milk was still considered a luxurious commodity, where only the group of middle and above economic levels, who might routinely drink it.

Nutritious sidedishes are essential for children. The majority of the mothers agreed to this statement. This showed that the mothers' awareness was high to provide the best foods for their household members.

In regard to the statement not to consume meat due to its expensive cost, the opinions of the mothers were split, some agreed and some others disagreed. Similar to milk, meat was also considered as an expensive commodity. Therefore it was normal if the mothers, based on an economic consideration, chose not to consume meat.

Provision of complementary feeding to children under six months was still encountered in rural areas. That is why the statement that children under 2 to three months old were allowed to be given ripe banana was not agreed by almost half of the mother, which means that the other half might agree to the statement. Therefore, the understanding of complementary feeding becomes very important to be constantly communicated to the mothers in rural areas so that the food pattern of their children becomes better according to the nutritional requirement.

Having breakfast is important for children. This might have been well understood and practised in the households of the mothers who became the respondents of this study. Most of the mothers agreed on the statement on the importance of having breakfast. Breakfast gives an important contribution to the fulfillment of children's nutrition, and therefore the mothers must pay attention to it so that having breakfast becomes a habit in their households.

According to Permenkes (a regulation of the Health Ministry) Number 33 in 2012 on the Exclusive Breastfeeding, what is meant by exclusive breastmilk is breastmilk which is given to a child since born up to six months old, without any complementary food and/or substituting it with other foods or drinks. Therefore, if the exclusive breastmilk is only given to the child up to three months old, that does not meet the requirements as defined by exclusive breastmilk. The distribution of the nutritional attitude towards the statement that exclusive breastmilk is for children up to three months old showed that many of the mothers disagreed and also many agreed on the statement. This indicates that the practice of exclusive breastmilk has not been applied maximally among the mothers in rural areas so it is necessary to improve the roles and supports of their household, community, the local government, the central government towards the exclusive breastfeeding.

The importance of drinking milk to strengthen the bones and teeth was well understood. That's why the majority of the mothers agreed on the statement. Milk is a source of calcium which is important for child growth. The socialization of drinking milk for the tealth of the Indonesian people has been done since 1950s with a slogan of *Empat Sehat Lima Sempurna* (Four Healthy, Five Perfect), which mention the daily food components consisting of rice, vegetable, sidedish, fruit, and milk.

Junk-foods, such as *ciki* (packaged snacks which are crispy, sweet/salty, and may contain food additives), are commonly loved by children. This kind of foods is commonly consumed as a snack by children. Most of the mothers agreed that *ciki*-like foods were not good for children. However, there were still some others who might agree on the *ciki*-like snacks for their children.

Most of the community members have realized the importance of vegetable consumption. The vegetables were consumed as cooked vegetables or raw vegetables/salad. Most of the mothers agreed that cooked vegetables was safer than raw vegetables/salad. The fact that there were some mothers who agreed on the consumption of raw vegetables/salad might be due to the culture of the food pattern in the research site where the people there are accustomed to consuming raw vegetables/salad.

Cadres. The nutritional attitude of the cadres as can be seen in Table 8.5 shows a result which is different from that of the mothers of children under five. In the control group, the number of the cadres with a good nutritional

attitude increased from 75.0% (baseline) to 100.0% (endline), but in the intervention group it decreased from 71.4% (baseline) to 64.3% (endline). The average score of the nutritional attitude in the control group increased 3.8 and in the intervention group decreased 0.4. The result of a statistical test showed that there was no significant difference in the score change between the control group and the intervention group ($p>0.05$).

Table 8.5 Categories of the cadres' nutritional attitude

Categories of nutritional attitude	Control				Intervention			
	Baseline		Endline		Baseline		Endline	
	n	%	n	%	n	%	n	%
Good (>80%)	3	75.0	4	100.0	10	71.4	9	64.3
Moderate (60–80%)	1	25.0	0	0.0	4	28.6	5	35.7
Poor (<60%)	0	0.0	0	0.0	0	0.0	0	0.0
Mean ± Std (score)	86.3 ± 4.8		90.0 ± 4.1		89.3 ± 10.9		89.0 ± 11.0	
Difference (score)	3.8 ± 7.5				-0.4 ± 11.5			
Mann Whitney test (p value)	0.481							

Table 8.6 shows the distribution of the cadres in the control group and in the intervention one by the statement of nutritional attitude. In general, the nutritional statements asked had been positively responded by the cadres. This showed that in general the cadres had actually possessed a better nutritional attitude compared with the mothers of children under five.

There were several items of the nutritional attitude statements which had not been responded correctly by the cadres, for example, on whether children should drink powdered/liquid milk or the sweet condensed milk. There were still many of the cadres who considered the sweet condensed milk was good for children to drink. Besides that, some of the cadres also agreed that it was not a must to give exclusive breastmilk to children up to six months old.

Thus, the nutritional attitude which had been relatively good among the cadres should be maintained or improved in order that it gets better. The cadres were the leaders of the mother participants of *Posyandu*; therefore empowering the cadres continuously are able to give a positive impact to the entire mother participants of *Posyandu*.

Table 8.6 Distribution of the cadres by statement of nutritional attitude

Statements of nutritional attitude	Control				Intervention			
	Baseline		Endline		Baseline		Endline	
	n	%	n	%	n	%	n	%
1. I will provide vegetables daily for consumption of my household.	2	50.0	4	100.0	14	100.0	13	92.6
2. My child had better drink powdered/ liquid milk than sweet condensed milk	1	25.0	2	50.0	13	92.9	9	64.3
3. Providing nutritious sidedishes is important for my child	4	100.0	4	100.0	14	100.0	11	78.6
4. I disagree that a child does not need to consume meat because its price is expensive	4	100.0	4	100.0	13	92.9	12	85.7
5. I disagree that a child of 2–3 months may be given banana in order not to be fussy	4	100.0	3	75.0	12	85.7	12	85.7
6. Children must have breakfast everyday to be energetic in their activity	4	100.0	4	100.0	14	100.0	14	100.0
7. I disagree that exclusive breastmilk is given to children up to three months old	4	100.0	4	100.0	8	57.1	11	78.6
8. Drinking milk is important for children to strengthen their bones and teeth	4	100.0	4	100.0	14	100.0	14	100.0
9. Streetfoods, such as <i>ciki</i> , is not good for children	4	100.0	3	75.0	9	64.3	13	92.9
10. Boiled vegetables are safer than raw vegetables/salad	1	25.0	2	50.0	12	85.7	13	92.9

8.3 Nutritional Behaviour

Mothers. Nutritional behaviour is a habit practised in daily life particularly connected with an eating habit. From Table 8.7 it is known that the habit of consuming vegetables among the children in general increased, either in the control group or in the intervention one. In the intervention group the increase of the children consuming vegetables reached 11.0%. In many cases, vegetable consumption among children were sometimes low because many children did not like vegetables.

In another thing, it was encountered many of the mothers often/sometimes still gave sweet condensed milk to their children. The tendency of the sweet codensed milk consumption among the rural households was because the price of the sweet condensed milk was more affordable than that of the powdered or liquid milk. A better nutrition understanding occasionally can indirectly change a behaviour to a better one if there is an economic barrier in a household. According to a study conducted by Agustina (2007), it was found that the factors which affected the amount of the condensed milk consumed were the household incomes, the number of the household members, and the number of the children under five in the household.

Consuming tofu/soybean cake (protein-source sidedishes) has become a habit among the households in Indonesia. Most of the mothers either in the control group or in the intervention one provided tofu/soybean cake for their children. At the endline, the percentage of the mothers who provided tofu/soybean cake increased compared with that at the baseline, and at the intervention group the increase was higher.

In regard to the nutritional behaviour connected with the meat consumption among the children, in general the mothers stated that their children did not consume meat. The increase of meat consumption among the rural households was rather difficult to be attained for the meat price was expensive and unaffordable for many of the community members. Therefore, the households in general relied on the foods of vegetable protein sources (tofu/soybean cake) as sidedishes. In fact, according to Fitri (2012), the richest iron source which is easily absorbed by the body is beef. The consumption of animal protein will support the body growth, increase the body immunity and intelligence.

Table 8.7 Distribution of the mothers by nutritional behaviour

Statements of nutritional behaviour	Control				Intervention			
	Baseline		Endline		Baseline		Endline	
	n	%	n	%	n	%	n	%
1. My child consumes vegetables	19	61.3	21	70.0	49	52.7	58	63.7
2. I often and/or sometimes give sweet condensed milk to my child	17	54.8	23	76.7	47	50.5	60	65.9
3. I provide tofu/soybean cake as sidedishes for my child	26	83.9	29	96.7	77	82.8	90	98.9
4. My child consumes meat (beef/chicken) as sidedishes	16	51.6	13	43.3	30	32.3	33	36.3
5. My child is accustomed to having breakfast	27	77.4	26	86.7	66	71.0	79	86.8
6. I make my child accustomed to drinking milk up to now	20	64.5	18	60.0	48	51.6	41	45.1
7. My child likes buying <i>ciki</i> -like foods	5	16.1	7	23.3	15	16.1	31	34.1
8. Vegetables for my child is always cooked, not served raw as salad	23	74.2	28	93.3	75	80.6	88	96.7

The children who became the samples in this study have been accustomed to having breakfast. At the endline, the number of the mothers in the control group who stated that their children were accustomed to having breakfast increased approximately 9.3%, while in the intervention group the increase reached 15.8%. This indicates that there is an increasingly understanding of the functions of having breakfast as a way to improve nutrition intakes for children. In addition, having breakfast for children is also very beneficial because according to Hardinsyah (2013), the children can have a better cognitive ability, a better learning effort, concentration or attention, and the children can have better abilities in reading as well as counting (mathematics), and better scores of similar abilities (language and logic).

The milk-drinking habit among the children both in the control group and in the intervention one still needs to be increased. Even at the endline, the percentage of the mothers who were used to giving milk to their children

slightly decreased. It seemed that in line with the increase of the child age the milk-drinking habit started to be neglected. Many of the children, even though their age had not reached five years yet, they had to stop drinking milk since the price of milk was not affordable.

In line with the increase of the children's age, their habit of having streetfoods also got increased. That is why at the endline the percentage of the children consuming streetfoods were greater than at the baseline. *Ciki*-like snacks were streetfoods which were relatively common to be found at the stall in the rural areas.

The habit of serving cooked vegetables for children have been frequently practiced as a good nutritional behaviour. In Jawa Barat (West Java), vegetables are also served raw because of the cultural-factor influence. Table 8.7 shows that the percentage of the mothers who served cooked vegetables at the baseline or at the endline were relatively many.

Cadres. Table 8.8 shows the nutritional behaviour of the cadres. In the case of the vegetable-consumption habit, it seemed that in the cadres' households it was not maximally practiced. Vegetables should be consumed daily, but in the cadres' households the percentages of the households consuming vegetables ranged from 50.0% to 85.7% both at the baseline and in the endline.

Consuming sweet condensed milk among the children should not be practiced because the milk contains too much sugar. However, among the control group all of the cadres stated giving sweet condensed milk to their children. In the intervention group, fewer mothers gave sweet condensed milk.

The practice of serving tofu/soybean cake was relatively spread throughout the cadres' households. Almost all of the cadres either in the control group or in intervention one provided tofu/soybean cake as sidedishes for their children. Tofu/soybean cake among the Indonesian people has been popular due to its affordable price.

Regarding the habit of consuming meat among the children, in the intervention group the number of the children who were accustomed to consuming meat was lower than that in the control group. Based on the socio-economic status, the people in the control group were in fact higher compared with those in the intervention group. This might affect the provision of nutritional animal-sourced foods, where in the control group were found more children who were used to eating meat.

Table 8.8 Distribution of the cadres by nutritional behaviour

Statements of nutritional behaviour	Control				Intervention			
	Baseline		Endline		Baseline		Endline	
	n	%	n	%	n	%	n	%
1. My child consumes vegetables	2	50.0	3	75.0	12	85.7	10	71.4
2. I often or sometimes give condensed milk to my child	4	100.0	4	100.0	8	57.1	8	57.1
3. I provide tofu/ soybean cake as my child's sidedishes	4	100.0	4	100.0	14	100.0	13	92.9
4. My child consumes meat (beef/chicken) as sidedishes	3	75.0	4	100.0	10	71.4	5	35.7
5. My child is accustomed to having breakfast	4	100.0	4	100.0	8	57.1	13	92.9
6. I get my child accustomed to drinking milk up to now	1	25.0	1	25.0	6	42.9	8	57.1
7. My child likes to have <i>ciki</i> -like streetfoods	4	100.0	0	0.0	3	21.4	5	35.7
8. Vegetables for my child are always cooked, not served raw as salad	4	100.0	4	100.0	14	100.0	12	85.7

Having breakfast is an eating habit which is very important to meet children's nutrition adequacy. In the intervention group, there was a high increase in the habit of having breakfast at the endline compared with that at the baseline. In the guideline of balanced nutrition is explicitly stated the importance of having breakfast for the households in Indonesia. Hardinsyah (2013) explained that having breakfast is important because after getting up in the morning, a person requires the availability of energy for the brain and stamina to start an activity. Having breakfast may improve stamina, learning concentration, working and learning comfort. In addition, the habit of having breakfast shows that we have build in a healthy eating culture and behaviour which belongs to one of the elements of balanced nutrition.

Drinking milk among the cadres' households was relatively rare. This is connected with the limited number of the cadres who had children under five. In general, the households in Indonesia rarely drink milk for the its price is considered expensive. Frequently it is only children under five who

are prioritized to drink milk. According to Ahmad and Hermiyetti (2008), the household expenditure had a positive and significant effect towards the consumption of powdered milk, baby powdered milk, and sweet condensed milk.

The habit of having *ciki*-like snacks is still commonly encountered among the cadres' households. These streetfoods were easily met in the rural areas since they were loved by the children. The increasing behaviour of having *ciki*-like streetfoods among the children in the intervention group could be due to the easy access to the streetfoods of this kind in the stalls around their houses. According to Fatmah and Nurasiah (2002), children under five of high socio-economic households tended to consume snacks with high calories, such as hamburger, fried chicken, french fries etc. On the other hand, children of a low economic group tended to buy snacks of low calories, such as chips made of flour, jelly, and candies.

In regard to the habit of eating cooked vegetables, in general it has been practiced a lot both in the control group and in the intervention one. The consumption of cooked vegetables will reduce the possibility of contamination by bacteria or microorganisms. Besides that, consuming cooked vegetables is able to reduce the residue of a heavy metal which may be contained in the vegetables. According to Widaningrum *et al.* (2007), in the household level, the decrease of the heavy metal residue which has been contained in the vegetables can be done by washing the vegetables with a commercial sanitizer or blanching them with boiling water for 3–5 minutes before consumption or further processing. In addition, the mothers should not use kitchen utensils which are soldered by using lead, and they should make their household members get accustomed to consuming foods containing high fibres. Therefore, even though consuming raw vegetables/salad has been entrenched among the community in Jawa Barat, this custom can actually be changed through activities of elucidation so the community will get accustomed to consuming vegetables in a safer way.

9

Eating Habits of Children under Five

The good eating habit of children under five starts from the family with the direct involvement of parents, mother, father, and the rest of the household members. The role of the mother is the most influential one toward the formation of children's eating habit as the mother creates the menu, starting from arranging the menu, buying the ingredients, cooking, preparing and serving the dish, distributing food, and teaching a good and healthy eating manner to the children (Suharjo 1989). The good eating habit exactly starts from a good feeding pattern. In the first two years, children tend to be passive, meaning that the food consumed is decided by the mother or the caregiver, while in the ages of 3–5 (pre-school) children tend to be more active in a sense that they decide what to eat themselves (Spohrer 1996). The nursing pattern in this research involves the good feeding pattern, the practice of giving fruit and vegetable, the history of formulated milk consumption, and the history of milk consumption.

9.1 Feeding Pattern

According to the analysis of factors influencing the feeding pattern and its relation to the nutritional status of children under five done by Supriatin (2004), from many factors (family size, parents' age, parents' educational background, the mother's level of nutritional knowledge, children's age, and birth distance) the one that is assumed to be influential for the feeding pattern is the mother's educational background. Besides that, there is a correlation between the feeding pattern and the nutritional status (weight for age and height for age).

The healthy and clean way of living life should not be done by the parents only, but also by the children in early ages. Mother's washing habit before feeding the children, children's washing habit before eating, children's habit of consuming colourful food, and the frequency of daily eating are parts of feeding patterns observed in this research.

According to Purba *et al.* (2003), there is a significant correlation between the disease caused by the *Taenia solium* and the habit of washing hands before eating. The mother's habit of washing hands before feeding the kids is considered to be good and healthy. In Table 9.1 it is shown that in the control village the level of education among the mothers was higher than in the intervention village, the percentage of the mother's habit of washing hands before feeding the children under five can be considered good as it reached 90.3%. On the other hand, the percentage in the intervention village was lower, that is, 82.8%.

Table 9.1 The distribution of feeding patterns of children under five

Feeding Patterns	Control		Intervention	
	n	%	n	%
Mother's habit of washing hands before feeding children	28	90.3	77	82.8
Children's habit of washing hands before eating	17	54.8	38	40.9
Children's habit of consuming colourful food	14	45.2	34	36.6
Children's eating frequency per day	2.7 ± 0.6		2.6 ± 0.8	

Getting the children used to washing hands before eating is a beginning of forming a good habit. Washing hands before eating is also a must in order that the children do not get infected by various diseases. Based on the table above, it can be seen that children's habit of washing hands before eating in the control village stands at 54.8% but only 40.9% in the intervention village. This indicates that in both villages, there are still relatively many of the mothers who have not got their children used to washing hands before eating. According to the Health Department (Depkes 2009), it has been scientifically proven that washing hands with hand soap may prevent the infection of diseases, such as diarrhea and accute respiratory infection. However, the incorrect washing habit among children under ten is still at a high level. As children of that age is very active and vulnerable to the infections of diseases, the increase of awareness regarding the importance of washing hands with

soap in daily life among them and their caretakers is needed. The practice of washing hands with soap after excretion and before touching the food may decrease the number of diarrhea cases by half and acute respiratory infection up to one fourth. This practice is also regarded to be able to prevent skin and eyes infection.

Children's habit of consuming colourful food is also a bad habit, especially for children under five. This is because the colourful food generally has been mixed with dangerous colouring substances like those applicable for a textile dye during the production process that it may bring negative impacts for the body when consumed in both short and long terms. Children's habit of consuming colourful food in the control village was quite high, it stands at 45.2%. That percentage was not far from the percentage in the intervention village (36.6%). This might be caused by children's tendency to get attracted by food with beautiful colour and shape, therefore the food with bright colour became more preferable than the less-colourful one. The result of the research done by Nugraharini (2011) about the factors related to the act of choosing snacks among elementary students in SD Ngadirgo 01 Kecamatan Mijen, Semarang, stated that there was a correlation between knowledge, breakfast habit, the habit of bringing food from home, the amount of pocket money, their response after seeing advertisements on television, parents' role, and friends' role with the act of choosing snacks.

In the village provided with an intervention, it was expected that there would be a raise of awareness of the mothers who had children under five to pay closer attention to the habits of buying snacks among children under five that they might help decrease the percentage of children under five's habit of consuming colourful food. In fact, changing the children's habit was not easy and it needed a more optimal and continuous effort from the mothers.

The frequency of children's daily eating reflects children's good eating habit or vice versa. The average frequency of children's eating in the control village and that in intervention village were the similar, 2.7 times per day in the control village, and 2.6 times per day in the intervention village. The average of eating frequency among children under five per day should be more frequent, 3 or 4 times per day. Therefore, the children's frequency of eating in both control and that in the intervention villages need to be improved in order that the need for nutrition among children under five can be fulfilled optimally.

9.2 The Habit of Consuming Fruit and Vegetable

The habit of consuming fruit and vegetable since early ages needs to be enforced to make children used to it once they turn adult. Fruit and vegetable are good source of nutrition, vitamin, and mineral, and it should be placed in every dish in the menu. According to Vatanparast *et al.* (2005), the consumption of vegetable and fruit, calcium, and physical activities are significant indicators from the total amount of mineral in boys' bone ranged from children to teenager. According Tylavsky *et al.* (2004), high consumption of fruit and vegetable has a good impact for the bone and body among girls in early puberty. Table 9.2 shows the distribution of amount and percentage of children's fruit and vegetable consuming habit in both groups (the control village and the intervention village).

Table 9.2 The distribution of vegetable and fruit consuming habits of children under five

The habit of consuming fruit and vegetables	Control		Intervention	
	n	%	n	%
Consuming fruit since early years	28	90.3	79	84.9
Consuming vegetables since early years	26	83.9	76	81.7

The habit of consuming fruit since early ages in the control village and intervention village has been high enough. In the control village, 90.3% of children under five had been introduced to fruit consumption since early ages, while in the intervention village, the rate stands at 84.9%. On the other hand, the habit of consuming vegetable among children in early ages of growth is relatively the same in both control and intervention village, however, the percentage in the control village was little bit higher than in the intervention village.

Table 9.3 Fruits consumed frequently by children under five

Fruit	Control		Intervention		Total	
	n	%	n	%	n	%
Orange	21	67.7	53	57.0	74	60.7
Banana	14	45.2	23	24.7	37	30.3
Papaya	5	16.1	4	4.3	9	7.4
Others	12	38.7	70	75.5	82	67.0

The fruits that were consumed most frequently among children under five in early ages in the control village and the intervention one consisted of orange, banana, and papaya. Based on Table 9.3, it can be inferred that the consumption of orange, banana, and papaya among children under five in the control village was more frequent than the consumption in the intervention village. The results, among others, were due to the social and economy level of the households in the control village that was better than the families in the intervention village that it influenced the level of fruit consumption.

9.3 The Habit of Having Streetfood

The habit of having streetfood is one of the contributing factors that may influence the amount of nutrition and children's nutritional status. A good habit of having streetfood may contribute to the increase of enough energy and protein for children, but in contrast, the wrong and unhealthy habit of having streetfood will bring negative impact and harm the children's body. That is caused by, according to Sugiyatmi (2006) based on the survey done by Streetfood Project (1989) in Jakarta, Bogor, Rangkasbitung, and small towns like Cibadak, Rengasdengklok, Pacet, and Cikampek, the many vendors that added artificial colouring substance into their snacks, especially beverages.

Table 9.4 presents the distribution and percentage of having-streetfood habits among the children under five in two treated groups (the control village and the intervention village). The percentage of having-streetfood habits among the children under five since early ages in both control and intervention villages was quite high, each reached 74.2% and 78.5% respectively. This means that more than half of the total children under five in both groups, the control and intervention village, had a habit of eating streetfood.

Table 9.4 Distribution of having-streetfood habits among the children under five

Having-streetfood habits	Control		Intervention	
	n	%	n	%
Yes	23	74.2	73	78.5
No	0	0.0	1	1.1
N/A*	8	25.8	19	20.4

*N/A: not applicable due to age

The streetfoods that were bought by the children under five in the two groups of villages were sausages, *ciki*, candy, biscuit, wafer, bread, and seaweed jelly. The most frequently bought by the children under five in the control village was biscuit (25.8%), sausages and candy (19.4%), and *ciki* (16.4%). Meanwhile, in the intervention village, the snack that was most frequently bought was biscuit (39.9%), bread (25.8%), candy (19.4%), *ciki* and wafer (19.4%) (Table 9.5). According to Fatmah and Nurasiah (2002), children under five from the lower-ranked community tended to buy low-calorie snacks such as, cracker, jelly, and candy.

Table 9.5 Distribution of the most frequently bought streetfoods

Streetfoods	Control		Intervention	
	n	%	n	%
Sausages	6	19.4	11	11.8
<i>Ciki</i>	5	16.1	13	14.0
Candy	6	19.4	18	19.4
Biscuit	8	25.8	37	39.8
Wafer	5	16.1	13	14.0
Bread	0	0.0	24	25.8
Seaweed jelly	0	0.0	11	11.8
Others	21	67.5	46	49.7

The having-streetfood habit in early ages, especially consuming snacks and sweets like candy and chocolate is not good for the formation of good and healthy eating habit. If children frequently have streetfoods, they will have no appetite in having their regular food as they feel full after having the snacks. The nutrition from the snacks is generally not good enough seen from the amount and the quality, that in the end it may cause a lack of nutrition intakes in the daily menu for children under five.

9.4 The History of Formulated Milk Consumption

Based on the rule of the Minister of Health No. 33 Year 2012 about Breastfeeding, formulated milk is milk that is formulated as a substitute for ASI (*Air Susu Ibu*/breast milk) for babies up to six months old. Every mother who

gives birth should breastfeed the baby, except if there is a medical indication (baby's or mother's medical condition that makes breastfeeding impossible), mother's death, or separation between the baby and the mother. Therefore, the baby can be fed with formulated milk. According to the Ministry of Health (Depkes 2010), when using a formulated milk, there must be a guarantee that the stock is enough for continuous consumption, the storage is safe, the water and tools for making it are available, clean, and hygienic. Another thing is that parents/ family have to be well-informed in order for them to fully understand, to be able to prepare and feed the baby with formulated milk based on the correct procedures. According to the statement of the Minister of Health of Indonesia No. 237/Menkes/SK/IV/1997 regarding the marketing of the substitute for ASI, ASI (breastmilk) is the best and most appropriate food for supporting the healthy growth and development of babies and infants. Therefore, its use must be protected and increased.

Breast milk is a dynamic liquid that provides not only enough nutrition for premature and nonpremature baby, but it also provides additional substances (hormone, antibody, and growth factors) that is great and may positively influence the development of infants. Breast milk provides a well-balanced nutritious food and influences the strength and immunity best for babies that it may decrease the chance for babies to get infected by diseases. Breastfeeding is a must for a mother to fulfil the given right of the baby to get enough food and the highest standard of health possibly reached (Directorate General of Public Health, the Ministry of Health 2000).

In a certain condition, a newborn baby or a baby under the age of one can be fed with formulated milk. Even so, it does not mean that giving formulated milk can substitute breastfeeding completely because when it is seen from the nutrient contents which are very complex in breast milk for babies, and also the moral bond that may form between the mother and the baby, breast milk is irreplaceable. Table 9.6 presents the distribution of numbers and percentages of the history of formulated milk consumption in the control village and the intervention village.

Based on Table 9.6 it can be inferred that in the control village and intervention village, the average number of children who were given formulated milk was high. The children under five fed with formulated milk starting from the time when they were less than one year old in the control village were 32.3%, while in the intervention village the percentage reached 23.9%.

Formulated milk is generally given to the children under five as a supplement of breast milk when the amount of breast milk is not sufficient to meet the baby's need for nutrition. The reasons that mothers gave formulated milk to their children were relatively the same in both villages, that is, very little amount available or no breast milk at all that caused the amount of breast milk became insufficient. In the control village, 50.0% of mothers gave formulated milk by reason that they had very little or even no breast milk at all, while in the intervention village, 61.9% of mothers gave formulated milk by reason of having no breast milk at all. The frequency of feeding with formulated milk reached the average of 2.9 times a day in the intervention village and 3.8 times in the control village. The frequency of giving formulated milk was usually adjusted in accordance with the children's need, that when there was no breast milk at all, it could be given more frequently.

Table 9.6 Distribution of the history of formulated milk consumption

The history of formulated milk consumption	Control		Intervention		Total	
	n	%	n	%	n	%
Giving formulated milk:						
- Yes	10	32.3	22	23.9	32	26.0
- No	21	67.7	70	76.1	91	74.0
Frequency of feeding with formulated milk (times/day)	3.8 ± 4.2		2.9 ± 2.8		3.2 ± 3.3	
Reasons for giving formulated milk:						
- No breastmilk/ or very little	5	50.0	13	59.1	18	56.2
- Inverted nipple	0	0.0	1	4.5	1	3.1
- Working time	0	0.0	1	4.5	1	3.1
- Children's refusal	1	10.0	0	0.0	1	3.1
- Others	4	40.0	7	31.8	11	34.4

9.5 The History of Milk Consumption

Drinking milk for children under five is really good for fulfilling the daily need for nutrition. It is because milk is a source of protein, mineral, and contains high calcium. The habit of drinking milk must have been introduced to the children under five since they were one year-old. In general a mother will pay closer attention to the drinking-milk habit of the children under five. The giving of milk done after the children turned one in the control village

was 19.4% and in the intervention village was 13.0% (Table 9.7). Giving milk to the children under five in both villages was still severely lack. This was caused by the price of milk that was relatively expensive that many parents were unable to afford. According to Ahmad and Hermiyetti (2008), the house expenditure had a significant influence on the consumption of powdered milk, powdered milk for baby, and condensed milk.

For children who loved drinking milk, the frequency of drinking milk in a week was relatively high, 17.7 times in control village and 17.8 times in the intervention village.

Table 9.7 Distribution of the history of milk consumption

History of milk consumption	Control		Intervention		Total	
	n	%	n	%	n	%
Giving milk (not condensed milk)						
- Yes	6	19.4	12	13.0	18	14.6
- No	25	80.6	80	87.0	105	85.4
Frequency of drinking milk (times/week)	17.7 ± 17.8		17.8 ± 14.6		17.8 ± 15.2	

10

Food Consumption

10.1 Food Frequency

Food Frequency Questionnaire (FFQ) is one of the methods used to obtain data on the frequency of food-stuff consumption or processed-food consumption within a certain period, for example a day, week, month, or year. In this research, the food consumption frequency of children under five was determined and calculated per week. The frequency and amount of cereal consumed by the children under five, both in the control group and in the intervention one, are displayed in Table 10.1.

Based on the table below, the frequency of rice consumption per week by the children under five, either in the control group or in the intervention one, was the highest compared with the consumption frequency of other kinds of cereal, namely, porridge, and noodle. However, there was a significant difference between the baseline and the endline data in both of the groups. In the control group, it was known that there was an increase of the rice consumption frequency per week which was significant in the endline data compared with that in the baseline data. On the other hand, the group given an intervention did not experience any significant increase of the rice consumption per week in the endline data.

The amount of cereal consumption which increased most significantly was porridge consumption among the children under five per week in the intervention group compared with that in the control group, that is, the consumption frequency nearly reached 30 g/week, either in the baseline or in the endline. The increase in the amount of porridge consumption was, among others, because its texture was soft and its taste was sweet so it was preferred by children under five compared to rice or noodle.

Based on Table 10.2, the average consumption frequency of animal-sourced food per week by the children under five in the control group did not change significantly from the baseline to the endline for the kinds of animal-sourced foods, such as chicken, beef/lamb, fish, egg, and milk. Likewise, in the intervention group there was no significant increase of the consumption frequency of animal-sourced food from the baseline to the endline. The consumption frequency of animal-sourced food in the intervention group was not significantly different from that in the control group.

The quantity of animal-sourced food consumption of the children under five in the intervention group was higher compared with that in the control group. Involving the cadres and the mothers of children under five to take active participation in the *Posyandu* as well as by providing nutritional extension continually in the intervention group boosted the increase in the amount of animal-sourced food consumption among the children under five so it is expected to be able to improve as well as to maintain the optimal nutritional status of the children under five, particularly in the intervention group.

The frequency of bean consumption included tofu and tempeh among the children under five who were given an intervention and who were not (control) as displayed in Table 10.3. The frequency of tempeh consumption in the control group per week slightly increased. This can be seen from the increase in the range of the tempeh consumption per week at the endline compared to that at the baseline. On the other hand, in the intervention group the range of the bean consumption frequency decreased, both the frequency of tofu consumption and of *tempeh* consumption among the children under five per week. However, in general, the consumption frequency among the children under five either in the control group or in the intervention one was relatively constant and did not change much in each week.

The average amount of tofu and *tempeh* consumption per week was higher in the intervention group at the endline compared with the average amount of the tofu and *tempeh* consumption in the control group. In the intervention group, the mothers of children under five and the cadres were actively involved in the *Posyandu* activities as well as got a continual nutritional extension so they knew and understood the frequency and amount of the vegetable protein food-source consumption which were good according to the age and condition of the children under five. The consumption of foods containing protein, either animal protein or vegetable protein, in an adequate amount is able to increase the growth of children under five at its optimum.

Table 10.1 The frequency and amount of cereal consumed by the children under

Cereal	Control (n=31)				Intervention (n=93)			
	Baseline		Endline		Baseline		Endline	
	times/week	g/week	times/week	g/week	times/week	g/week	times/week	g/week
Porridge	6.7 ± 6.4	54.6 ± 31.8	1.9 ± 2.1	88.1 ± 22.9	4.1 ± 4.5	82.2 ± 29.6	2.2 ± 2.2	83.3 ± 31.6
Rice	12.7 ± 8.5	46.8 ± 35.2	10.9 ± 2.9	41.8 ± 20.0	14.9± 8.6	50.6 ± 14.6	10.21 ± 3.5	41.5 ± 16.8
Noodle	1.8 ± 2.1	44.1 ± 30.7	1.3 ± 0.8	36.0 ± 17.6	1.7 ± 2.1	60.8 ± 21.1	1.5 ± 1.0	34.7 ± 16.0

Table 10.2 The frequency and amount of animal-sourced food consumed by the children under five

Animal-sourced food	Control (n=31)				Intervention (n=93)			
	Baseline		Endline		Baseline		Endline	
	times/week	g/week	times/week	g/week	times/week	g/week	times/week	g/week
Chicken	1.3 ± 1.3	39.9 ± 19.9	1.0 ± 0.8	41.5 ± 17.2	1.1 ± 1.7	48.4 ± 10.4	0.7 ± 0.5	47.9 ± 17.2
Beef/lamb	0.8 ± 3.8	39.6 ± 15.6	0.1 ± 0.2	40.0 ± 19.5	0.1 ± 0.2	51.0 ± 17.8	0.1 ± 0.3	38.8 ± 15.1
Fish	1.2 ± 2.1	32.5 ± 18.7	1.7 ± 2.8	40.1 ± 19.5	1.1 ± 1.8	59.2 ± 14.9	1.3 ± 2.2	42.6 ± 32.6
Egg	3.3 ± 4.2	48.4 ± 17.9	1.8 ± 0.9	48.6 ± 16.4	2.9 ± 2.7	57.8 ± 7.8	2.4 ± 2.1	54.5 ± 14.5
Milk (liquid)	5.8 ± 11.7	173.7 ± 58.0	7.0 ± 6.5	145.7 ± 74.1	4.7 ± 8.6	174.6 ± 53.4	4.0 ± 4.7	144. ± 83.3

Table 10.3 The frequency and number of beans consumed by the children under five

Beans	Control (n=31)				Intervention (n=93)			
	Baseline		Endline		Baseline		Endline	
	times/week	g/week	times/week	g/week	times/week	g/week	times/week	g/week
Tofu	1.8 ± 1.8	23.9 ± 14.4	1.6 ± 0.8	26.7 ± 12.8	2.8 ± 4.3	25.7 ± 6.0	2.0 ± 1.9	27.2 ± 13.7
Tempeh	2.3 ± 2.0	23.4 ± 10.5	2.5 ± 2.2	24.5 ± 9.0	3.4 ± 4.3	25.8 ± 5.4	2.5 ± 2.6	31.3 ± 24.0

Table 10.4 shows there was a change in the frequency and amount of vegetable and fruit consumption by the children under five at from the baseline to the endline of the two groups, the control group and the intervention one. Based on the table it is observed that the intervention group experienced a higher increase in the frequency of vegetable consumption per week compared with that in the control group even though the increase was not so significant. Whereas, in the frequency of fruit consumption there was a decrease at the endline in the intervention group. This is, among others, assumed due to the fact that the people, especially the rural people were rarely and not accustomed to consuming fruit, and not all fruit plants could be planted and could grow well in the yard so this triggers there was still no increase and even there was a decrease in the frequency of fruit consumption per week in the intervention group.

The amount of vegetable consumption at the endline among the control group and the intervention group experienced a significant decrease compared with the vegetable consumption at the baseline. Marotz *et al.* (2005) states that the older the age is, children under five will be creverer in selecting foods which are considered having delicious tastes, such as sweet and salty, as well as more children under five tend not to like vegetable for it is tasteless. This also became one of the causes the amount of vegetable consumption of the children under five at the endline decreased compared that at the baseline. It is different from fruit who has colour, size as well as an more interesting taste than the taste of vegetable, so this boosted the increase in the amount of fruit consumption at the endline even though the frequency of fruit consumption was relatively constant and did not significantly increase.

consumption in the intervention group was lower than the increase in the control group. The consumption of various kinds of streetfoods per week increased both in the control group and in the intervention one at the endline. The streetfoods whose amount of consumption increased generally referred to the streetfoods which had a sweet or salty taste, and an interesting colour, shape and package as well as soft texture so that they were loved by children under five. Some of the streetfoods were *ciki*, candies, bread, seaweed jelly, and wafer. Whereas, the consumption of the streetfoods such as *siomay* (egg shrimpball wrapped in vegetable and tofu served in hot peanut sauce), *batagor* (fried tofu meatball), *cilok* (a fried salty snack made of cassava-starch batter), sausage, and nugget decreased in both of the groups from the baseline to the endline because their shape, colour, and taste were not interesting for children under five and children so they were not preferred by both of the groups under the treatment.

Table 10.4 The frequency and amount of vegetable and fruit consumed by the children under five

Fruit and vegetable	Control (n=31)				Intervention (n=93)			
	Baseline		Endline		Baseline		Endline	
	times/week	g/week	times/week	g/week	times/week	g/week	times/week	g/week
Vegetable	5.5 ± 6.1	31.4 ± 20.6	4.0 ± 3.9	15.4 ± 7.3	5.6 ± 5.7	46.7 ± 11.7	5.3 ± 3.9	23.5 ± 26.6
Fruit	2.2 ± 2.5	54.0 ± 20.9	2.4 ± 2.6	80.2 ± 52.2	2.9 ± 3.8	57.0 ± 3.8	1.8 ± 1.9	97.1 ± 48.3

Table 10.5 The frequency and amount of streetfood consumed by the children under five

Streetfood	Control (n=31)				Intervention (n=93)			
	Baseline		Endline		Baseline		Endline	
	times/week	g/week	times/week	g/week	times/week	g/week	times/week	g/week
<i>Ciki</i>	1.8 ± 2.8	7.9 ± 3.0	3.2 ± 3.9	10.0 ± 2.5	2.7 ± 4.9	9.7 ± 7.3	4.0 ± 5.3	10.6 ± 6.1
Candy	2.8 ± 4.5	4.5 ± 3.0	3.5 ± 2.7	3.3 ± 2.0	3.0 ± 7.3	3.2 ± 2.7	4.0 ± 3.6	4.2 ± 2.6
Ice	1.8 ± 4.1	22.1 ± 5.5	2.4 ± 2.0	25.8 ± 11.1	0.9 ± 1.9	26.5 ± 7.1	3.0 ± 3.5	24.1 ± 6.7
Bread	1.3 ± 2.2	17.7 ± 9.3	1.6 ± 1.2	33.9 ± 9.4	2.1 ± 3.1	32.5 ± 26.4	2.1 ± 2.0	36.0 ± 13.7
Doughnut	0.3 ± 1.3	44.0 ± 0.0	0.8 ± 0.4	40.0 ± 0.0	0.7 ± 2.2	44.5 ± 8.6	1.3 ± 1.1	31.1 ± 10.8
Meatball	1.0 ± 1.5	110.9 ± 85.4	1.3 ± 0.9	96.0 ± 54.8	0.8 ± 1.9	65.5 ± 60.2	1.0 ± 1.2	93.0 ± 55.2
<i>Cilok</i>	0.8 ± 1.9	38.0 ± 17.0	1.5 ± 1.0	22.5 ± 7.9	2.2 ± 3.4	32.7 ± 4.8	2.4 ± 1.9	27.0 ± 13.2
Sausage	2.3 ± 4.8	26.8 ± 6.7	2.4 ± 3.4	21.5 ± 7.3	2.2 ± 3.7	25.6 ± 7.7	2.5 ± 3.4	22.2 ± 9.3
Nugget	0.4 ± 1.4	25.0 ± 0.0	0.8 ± 0.6	22.5 ± 11.6	0.3 ± 1.2	24.4 ± 1.7	1.6 ± 2.2	22.7 ± 12.1
Biscuit	3.2 ± 5.1	6.4 ± 8.7	2.1 ± 2.0	11.9 ± 4.6	4.8 ± 5.1	8.6 ± 8.7	3.8 ± 3.9	11.6 ± 6.7
Seaweed jelly	1.1 ± 1.9	24.5 ± 21.6	1.5 ± 1.1	51.3 ± 12.8	2.9 ± 5.5	19.9 ± 17.7	2.8 ± 3.1	52.7 ± 15.4
Wafer	1.5 ± 2.2	9.0 ± 2.4	2.2 ± 1.8	9.8 ± 2.6	3.0 ± 3.9	10.2 ± 1.5	2.6 ± 2.6	10.8 ± 5.1
<i>Siomay</i>	0.4 ± 1.3	175.0 ± 111.6	1.3 ± 1.0	24.0 ± 11.2	0.7 ± 1.9	160.8 ± 27.0	0.9 ± 0.8	25.7 ± 15.7
<i>Batagor</i>	0.7 ± 3.8	175.0 ± 35.4	1.6 ± 1.3	33.3 ± 17.1	0.3 ± 1.3	133.1 ± 38.1	1.7 ± 2.2	28.1 ± 14.0

Streetfoods have become a part which cannot be separated from the community life, either in the urban areas or in the rural areas. Several advantages of streetfoods, among others, were their prices were relatively cheap, they could easily be obtained, and they had a good taste. Therefore, almost all of the community, especially children under five loved streetfoods. Streetfoods are also able to contribute energy and protein for children. A good practice of having streetfood can positively affect the child health and vice versa (Andarwulan *et al.* 2009).

Based on Table 10.5 above, it is known that the frequency of streetfood consumption per week increased either in the control group or in the intervention one. However, it can be seen that the increase in the frequency of the streetfood

The intervention given to the intervention group including the extension of balanced nutrition to the mothers of children under five as well as the active participation of the *Posyandu* cadres did not automatically change the habit of streetfood consumption among the children under five, considering that it had become the children's daily habit and not all of the streetfoods gave a negative impact to the nutritional intake and the health of the children under five. Therefore, with the intervention given it is expected that it can arouse the awareness of the mothers of children under five to be more skillful and creative in making snacks by themselves for their children so that the snacks consumed by the children under five can contribute to a better and more nutritious intake for the children under five.

10.2 Food Preference

Preference towards a food is defined as the degree of liking and disliking towards the foods. Food preference will affect the consumption of the foods. Whereas, according to Birch & Fischer (1998), the food preference plays an role in explaining the food pattern of children as it is connected with food acceptance. The distribution of the children under five by kinds of vegetables preferred is displayed in Table 10.6.

Vegetables such as spinach, carrot, and vegetable soup were kinds of vegetables which were the most preferred, and in the intervention group the percentage of the children under five who loved the kinds of vegetables were far higher

than those in the control group. Whereas, the percentage of the children who preferred the kinds of vegetables such as cassava leaves, running beans, mushroom and *kangkung* was lower in the intervention group than that in the control group.

Table 10.6 Distribution of children under five by kinds of vegetables preferred

Kinds of vegetables	Control		Intervention		Total	
	n	%	n	%	n	%
Spinach	13	52.0	49	62.8	62	60.2
Carrot	13	52.0	21	26.9	34	33.0
<i>Kangkung</i>	7	28.0	6	7.7	13	12.6
Assorted vegetable soup	2	8.0	15	19.2	17	16.5
Cassava leaf	10	40.0	3	3.8	13	12.6
Mushroom	16	64.0	11	14.1	27	26.2
Running bean	7	28.0	1	1.3	8	7.8

The percentage of the children under five who loved vegetables, spinach, carrot, and assorted vegetable soup in the intervention group was far higher than that in the control group. This is, among others, because the mothers of children under five who have got an intervention know and understand better the kinds of vegetables which are good and suitable for the children so they chose to introduce and make themselves accustomed to giving the vegetables to the children under five. Whereas, in the control group, the practice of giving the kinds of vegetables was relatively unchanged. Besides that, the mothers of children under five tended to give several kinds of vegetables which were commonly consumed by the households, such as: cassava leaf, string bean, *kangkung*, and mushroom so the children under five did not like them. In addition, other factors such the fact that the mothers were lack of knowledge on the kinds of vegetables which were good for and preferred by children under five caused not all of the mothers of children under five selected and made the children coaccustomed to consuming the vegetables so the consumption of vegetables such as spinach, carrot, and assorted vegetable soup in the control group was lower compared with that in the intervention group.

Table 10.7 provides information on the distribution of children under five by kinds of fruits they liked. It was known that in the control group the kind of fruit loved very much by the children under five (50%) was avocado, while in the intervention group the fruit loved very much by the children under five (55%) was banana. In the intervention group avocado and orange were fruits which were loved by the children under five because the economic condition of the households in the control group on average had a household income as well as a prosperity level which was higher than that in the intervention group so the preferences to fruits were also varied even though they did not get intervention.

Table 10.7 Distribution of the children under five by kinds of fruits they preferred

Kinds of fruits	Control		Intervention		Total	
	n	%	n	%	n	%
Banana	8	32.0	43	55.1	51	49.5
Oranges	16	64.0	16	20.5	32	31.1
<i>Rambutan</i>	7	28.0	2	2.6	9	8.7
Grape	3	12.0	12	15.4	15	14.6
Avocado	19	76.0	15	19.2	34	33.0
<i>Duku</i>	5	20.0	10	12.8	15	14.6

In the intervention group, the children under five preferred banana very much. This was, among others, because banana is one of the most available. The availability of banana trees in the village can increase the preference as well as to make the children under five accustomed to consuming banana. Whereas, the percentages of other fruits preferred by the children under five very much were evenly distributed. In other words it can be said that on average the children under five like a kind of fruit because of its sweet taste, its interesting colour and shape, the kind of fruit provided by their mothers, and the habit of fruit consumption taught by their mothers and households.

Table 10.8 Distribution of the children under five by kinds of sidedishes they liked

Kinds of sidedishes	Control		Intervention		Total	
	n	%	n	%	n	%
Chicken	8	32.0	25	32.1	33	32.0
Egg	10	40.0	19	24.4	29	28.2
Chicken feet	1	4.0	10	12.8	11	10.7
Goldfish	5	20.0	3	3.8	8	7.8
Lever	2	8.0	16	20.5	18	17.5
Fish	13	52.0	3	3.8	16	15.5
Beef	13	52.0	1	1.3	14	13.6
Processed fished	8	32.0	2	2.6	10	9.7
Shrimp	19	76.0	49	62.8	68	66.0

The kinds of sidedishes loved by the children under five were as shown in Table 10.8 above. In the intervention group the children under five who liked sidedishes fish, shrimp, processed fish as well as meat were lower than those in the control group. Even, the percentage of the children under five in the control group who liked the sidedishes was on average above 50%. The economic condition and the household income in the control group which were higher than those in the intervention became the main factor of the preference to the sidedishes (fish, meat, and processed fish) for the children under five to be higher in the control group.

Table 10.9 Distribution of the children under five by kinds of snacks they preferred

Kinds of snacks	Control		Intervention		Total	
	n	%	n	%	n	%
Coated peanut	1	4.0	54	69.2	55	53.4
<i>Ciki</i>	7	28.0	10	12.8	17	16.5
Chocolate	8	32.0	4	5.1	12	11.7
Candy	3	12.0	16	20.5	19	18.4
Sausage	2	8.0	21	26.9	23	22.3

The percentage of the snacks loved by the children under five in both of the groups (control and intervention) is presented in Table 10.9 above. Based on the table, it was known that the group getting an intervention was not automatically able to reduce the percentage of the snack consumption as well as the percentage of the kinds of snacks loved by the children under five. It was observed that in the intervention group the percentage of the coated peanut preferences was the highest and far higher than that in the control group. Besides that, sausage was also a kind of snacks loved by many of the children under five in the intervention group than by the children in the control group.

In the intervention group, the mothers of children under five after getting an intensive and continual nutritional extension were more selective in choosing wholesome snacks or streetfoods for their children under five. This was one of the factors which led to the high percentage of the children under five who liked coated peanuts and sausages. In addition to their tastes which are salty and delicious, both of the snacks also give protein intakes to the children under five. Whereas the percentages of the preferences to other snacks, such as *ciki* and chocolate in the intervention group were lower than those in the control group for the mothers of children under five considere that the snacks did not contain nutritional intakes which were good enough for the children under five and the sweet taste in the chocolate would decay the teeth of their children under five.

Table 10.10 Distribution of the children under five by the kinds of sidedishes they disliked

Kinds of foods	Control		Intervention		Total	
	n	%	n	%	n	%
Egg	3	16.7	1	1.8	4	5.5
<i>Tongkol</i> fish	2	11.1	1	1.8	3	4.1
Salty dried fish	2	11.1	16	29.1	18	24.7

Based on the study conducted, in addition to obtaining information on the kinds of foods preferred by children under five, information on several foods which were not loved by the children under five was also obtained. Table 10.10 above explained several kinds of sidedishes which were not loved by the children under five in both of the groups (control and intervention). In the intervention group, salty dried fish as one kind of sidedishes was not loved very

much by almost 30% of the children under five, while in the control group eggs were the sidedishes which were not loved very much by approximately 16.7% of the children under five.

The percentage of the salty dried fish which was not loved very much by the children under five in the intervention group was the highest among the other sidedishes. This was because the mothers of children under five in the intervention group tended to select other kinds of sidedishes for their children under five, such as egg, chicken, or fresh fish. Besides that, based on the nutritional knowledge which they had obtained from the nutritional extension during the intervention that sidedishes, particularly animal protein sources which were the best for children under five, were egg, fresh fish, chicken or read meat.

The difference in the sidedishes which were not loved by the children under five in both of the group was influenced by several things, among others: the eating habit of the household, the way the mothers of children under five introduced the sidedishes to the children under five, or the children's allergy to a certain kind of the sidedishes.

Table 10.11 Distribution of the children under five by snacks they disliked

Kinds of snacks	Control		Intervention		Total	
	n	%	n	%	n	%
Bread and biscuit	4	22.2	16	29.1	20	27.4
<i>Ciki</i>	3	16.7	6	10.9	9	12.3

Based on Table 10.11, it is known that the snacks the children under five did not like in both of the groups had an almost similar percentage. Bread and biscuit were snacks which were not loved by the children under five either in the intervention group or in the control one. This was because there were many choices/preferences of the kinds of snacks which were more interesting as well as had a more delicious taste than bread or biscuits. Besides that, it was also because the bread/biscuit which was given did not have variations of its stuff as well as its taste so the children under five were likely to dislike it. This is in line with what is stated by Nuraini (2007), that children under five and children will tend to select and love foods which have interesting colours and shapes, and whose taste is sweet.

Table 10.12 Distribution of the respondents by kinds of vegetables and fruits they dislike

Kinds of vegetables and fruits	Control		Intervention		Total	
	n	%	n	%	n	%
Bean	1	5.6	8	14.5	9	12.3
<i>Kangkung</i>	1	5.6	11	20.0	12	16.4
Assorted vegetable sour soup	1	5.6	7	12.7	8	11.0
Melon	0	0.0	7	12.7	7	9.6

The habit of consuming various kinds of vegetables, particularly those of green and red/orange colours, must be introduced to children since their early age to be able to shape their preference to vegetables. According to Sanjur (1982), the food habit of children, including the habit of consuming vegetables among children is mainly influenced by the food habit of the household as well as an unlearned process, without any learning process carried out on purpose.

Based on Table 10.12 above, it is observed that in the intervention group the percentage of the respondents who did not like vegetables: beans, *kangkung*, assorted vegetables for sour soup, and melon was exactly far higher than that in the control group. Actually, the intervention group was expected to be able to make the mothers of children under five capable of introducing as well as making the children under five accustomed to consuming various kinds of vegetables and fruits. The reason that the kinds of vegetables were not liked in the intervention group were far higher was that the mother of children under five in the group tended to give vegetables which were mostly liked by the children under five in order that the desire for food of the children under five increased so that their nutrient intakes also increased. Thus, the children under five have been accustomed to some kinds of vegetables such as spinach, carrot, assorted vegetables for soup became uninterested in the kinds of vegetables which they rarely consumed such as *kangkung*, bean, and assorted vegetables for sour soup, which were likely to be sauted and whose taste was a little bit hot (spicy) so that these made the children under five not like the vegetables.

10.3 Food Taboo

Taboo food is still followed by most of the community in Indonesia. Many studies show that the community still follow the taboo food. In Table 10.12

are presented the kinds of taboo foods. In the control group and intervention one as many as 16% and 30% of the respondents respectively had taboo foods for their children.

In Table 10.13 are also displayed the taboo foods and their kinds for children. The kinds of taboo foods in the control group were banana blossoms, wide mushrooms, and sticky rice, while in the intervention group were banana blossoms, *ambon* banana, fish, sour and hot foods. The taboo foods were still followed because they strictly hold the customs and traditions which were followed by their ancestors.

Banana blossoms were taboo because they would make children shocked/suffered from heart attack. *Ambon* bananas made children like to be alone. Fish made children suffer from itchy skins and worms. Wide mushrooms made children become lazy and underestimated by other people. Sticky rice made children get difficulties in speaking. Sour foods made the children easily get irritated if they got married later. Hot/spicy foods made the children get stomachache.

Table 10.13 Taboo foods for the children under five

Statement	Control		Intervention		Total	
	n	%	n	%	n	%
Taboo foods for children						
- Yes	5	16.1	28	30.1	33	26.6
- No	26	83.9	65	69.9	91	73.4
Kinds of taboo foods:						
- Banana blossom	2	40.0	19	67.8	21	63.6
- <i>Ambon</i> banana	0	0.0	3	10.8	3	9.1
- Fish	0	0.0	2	7.1	2	6.1
- Wide mushroom	2	40.0	2	7.1	4	12.2
- Sticky rice	1	20.0	0	0.0	1	3.0
- Tamarind	0	0.0	1	3.6	1	3.0
- Hot/spicy foods	0	0.0	1	3.6	1	3.0

10.4 Nutrition Adequacy Level

According to Depkes (2011b), a balanced diet is a food composition recommendation which is suitable with one's nutritional need to stay healthy, grow, develop smart and productive based on the general guideline of

balanced diet. The nutrient adequacy, that is, the amount of each nutrient which must be fulfilled from the foods to cover almost all of the healthy people, is influenced by age, sex, activity, body weight and body height as well as the pregnancy and breastfeeding state. The community knowledge to select foods which are adequate and balanced for individuals and households is still poor. This is influenced very much by one's education level, socio-economy and culture. The energy and nutrient intakes of the children under five are displayed in Table 10.14. The energy and nutrient intakes of the children in the control group at the baseline were still below the recommended dietary adequacy (RDA), but at the endline the intakes increased exceeding the RDA except for vitamin A and vitamin C. In the intervention group, the energy and nutrient intakes had fulfilled the RDA except the iron and vitamin C intakes. The energy and nutrient intakes just reached enough at the endline except the calcium and vitamin C intakes.

Viewed from the proportion of the children under five whose energy and nutrient intakes were below 70% of the RDA, it was seen that the highest proportion ranged from 30% for the energy intake to 70% for the vitamin C intakes (See Table 10.15). The proportion patterns in the control group and in the intervention one were relatively the same. The proportion of the energy intake which was below 70% of the RDA was higher than the proportion from the results of the basic health research—Risksdas 2010 (Kemenkes 2011) to the Indonesian children, which was only 24.4%. This condition indicated that the nutrient intakes of the children were still deficient. This was in line the nutritional problems (index WAZ) which was increasingly worse with the increasing age of the children.

10.5 Nutritional Adequacy Level of the Households

A nutritional status is influenced by the nutritional intake and infectious diseases. If one does not get adequate nutritional intakes s/he will suffer from a nutrition deficiency and easily get sick. Likewise, if one frequently gets sick, this will arouse a problem of an eating desire and then this will result in a nutrition deficiency. At the household level, the energy and nutrient intakes were also still below the RDA, either in the control group or in the intervention group (See Table 10.16). In the intervention group on average the energy and

iron adequacy was better than that in the control group. After a one year intervention, on average the energy and nutrient adequacy levels got increased in both of the groups (control and intervention). However, at the end of the intervention (endline) the energy and iron intakes of the households were still below the RDA.

The Food Security Board—Dewan Ketahanan Pangan (2009) mentions that the people are said to be critical of energy consumption if the average energy consumption is less than the amount required by the body to stay active and healthy. In general the people who are critical of energy consumption are divided by two group, that is, very insecure (the level of energy consumption < 70% of the REA—Recommended Energy Adequacy) and those who had slightly insecure to moderately insecure (the energy consumption level is 70–90% of the REA). The proportion of the households with an energy and nutrient intake below 70% of the RDA was very high in both of the groups (control and intervention). The proportion was slightly bigger in the control group (See Table 10.17). The proportion of the energy intake which was below 70% is an indicator of the food security. This means that most of the households (more than 50%) in both of the groups (control and intervention) were the households categorized as being severely insecure. This is not surprising since most of the households were poor households.

Table 10.14 Intakes and the nutrient adequacy level among the children under five

Kinds of nutrients	Control			Intervention				
	Baseline		Endline	Baseline		Endline		
	Intake	Adequacy level (%)	Intake	Adequacy level (%)	Intake	Adequacy level (%)		
Energy (kcal)	649.9 ± 309.6	78.4 ± 32.1	1395.0 ± 508.3	132.1 ± 41.6	822.4 ± 516.8	98.3 ± 66.9	1245.0 ± 587.4	117.3 ± 57.3
Protein (g)	15.4 ± 7.5	77.0 ± 20.8	32.3 ± 10.7	126.2 ± 48.9	22.0 ± 23.1	109.2 ± 128.2	27.2 ± 13.3	102.1 ± 52.5
Calcium (mg)	352.8 ± 293.1	80.1 ± 68.5	591.8 ± 465.0	120.5 ± 95.4	492.8 ± 865.1	118.6 ± 205.9	362.4 ± 326.6	74.0 ± 66.1
Phosphorus (mg)	246.0 ± 191.7	85.1 ± 80.9	513.5 ± 241.9	135.1 ± 71.0	402.1 ± 653.4	140.7 ± 259.4	403.8 ± 269.3	105.3 ± 67.0
Iron (mg)	4.8 ± 4.0	66.1 ± 48.0	13.0 ± 7.0	159.4 ± 85.0	5.6 ± 4.5	72.6 ± 57.2	8.7 ± 4.8	105.6 ± 57.1
Vitamin A (RE)	281.0 ± 279.8	70.3 ± 69.9	347.6 ± 254.8	86.3 ± 64.1	381.9 ± 506.0	96.3 ± 127.7	390.4 ± 361.9	95.1 ± 87.3
Vitamin C (mg)	19.4 ± 20.1	45.2 ± 49.8	15.4 ± 14.6	37.4 ± 36.1	17.8 ± 18.6	41.9 ± 45.4	22.4 ± 21.3	53.2 ± 51.0

Table 10.15 The percentage of children under five by classification of the nutrition adequacy level

Treatment	Nutrients	Classification of RDA (%)							
		Baseline				Endline			
		<70	70-89	90-110	>110	<70	70-89	90-110	>110
Control	Energy	35.5	22.6	29.0	12.9	6.7	10.0	16.7	66.7
	Protein	48.3	24.1	17.2	10.3	13.3	20.0	6.7	60.0
	Calcium	54.8	9.7	12.9	22.6	44.8	3.4	3.4	48.3
	Phosphorus	58.1	9.7	16.1	16.1	16.7	10.0	10.0	63.3
	Iron	54.8	22.6	6.5	16.1	13.8	10.3	13.8	62.1
	Vit. A	67.7	9.7	3.2	19.4	48.3	17.2	3.4	31.0
Intervention	Vit. C	77.4	6.5	6.5	9.7	80.0	10.0	3.3	6.7
	Energy	34.8	20.2	16.9	28.1	17.6	18.8	16.5	47.1
	Protein	40.0	12.2	22.2	25.6	30.6	18.8	16.5	34.1
	Calcium	55.9	10.8	7.5	25.8	59.1	10.2	9.1	21.6
	Phosphorus	41.6	15.7	12.4	30.3	31.1	18.9	15.6	34.4
	Iron	53.8	16.5	6.6	23.1	33.7	11.2	14.6	40.4
	Vit. A	54.9	5.5	12.1	27.5	48.3	5.6	14.6	31.5
	Vit. C	81.5	10.9	0.0	7.6	66.7	13.3	8.9	11.1

Table 10.16 The households' intake and nutrient adequacy level

Nutrients	Control			Intervention		
	Baseline		Endline	Baseline		Endline
	Intake	Adequacy level (%)	Intake	Intake	Adequacy level (%)	Intake
Energy (kcal)	940.2 ± 366.6	52.7 ± 21.5	1288.0 ± 300.1	1178.2 ± 375.7	65.7 ± 20.6	1540.0 ± 459.8
Protein (g)	23.7 ± 8.9	52.5 ± 21.4	34.2 ± 9.7	29.6 ± 12.1	65.2 ± 25.8	39.2 ± 14.7
Calcium (mg)	144.2 ± 130.5	20.4 ± 19.2	241.6 ± 154.5	195.3 ± 148.1	28.0 ± 21.3	292.1 ± 198.1
Phosphorus (mg)	387.6 ± 318.7	72.9 ± 65.4	585.1 ± 207.9	467.4 ± 238.9	85.8 ± 45.8	683.5 ± 288.0
Iron (mg)	6.8 ± 4.0	45.4 ± 26.1	9.7 ± 3.8	7.8 ± 3.9	52.4 ± 26.7	10.4 ± 5.1
Vitamin A (RE)	148.4 ± 132.3	29.2 ± 26.4	260.8 ± 254.9	237.4 ± 248.8	46.8 ± 49.8	382.7 ± 411.8
Vitamin C (mg)	12.3 ± 12.2	17.8 ± 17.5	17.4 ± 19.4	22.2 ± 25.6	33.5 ± 38.8	25.5 ± 24.7
						37.4 ± 33.2

Table 10.17 The percentage of the households by classification of nutritional adequacy level

Treatment	Nutrients	Classification of the RDA (%)							
		Baseline				Endline			
		<70	70–89	90–110	>110	<70	70–89	90–110	>110
Control	Energy	83.9	6.5	9.7	0.0	53.6	35.7	10.7	0.0
	Protein	74.2	19.4	6.5	0.0	50.0	32.1	10.7	7.1
	Calcium	93.5	3.2	3.2	0.0	90.0	10.0	0.0	0.0
	Phosphorus	66.7	6.7	16.7	10.0	14.3	32.1	25.0	28.6
	Iron	87.1	6.5	0.0	6.5	64.3	25.0	7.1	3.6
Intervention	Vit. A	90.3	6.5	3.2	0.0	76.7	6.7	6.7	10.0
	Vit. C	83.9	6.5	9.7	0.0	93.3	3.3	0.0	3.3
	Energy	58.2	28.6	11.0	2.2	37.9	27.6	12.6	21.8
	Protein	65.2	17.4	12.0	5.4	43.3	20.0	16.7	20.0
	Calcium	95.7	2.2	0.0	2.2	86.8	7.7	2.2	3.3
	Phosphorus	42.9	18.7	12.1	26.4	12.2	18.9	17.8	51.1
	Iron	80.2	11.0	3.3	5.5	61.1	14.4	8.9	15.6
	Vit. A	79.3	9.8	2.2	9.8	63.3	12.2	4.4	20.0
	Vit. C	58.2	28.6	11.0	2.2	89.0	4.4	2.2	4.4

Nutritional and Health Status

11.1 Characteristics of Children under Five

The distribution of the children under five is presented in Table 11.1. In the control group the percentage of the male children under five was greater than that of the female ones, in contrast in the intervention group the percentage of the male children was lower than that the female ones.

Table 11.1 Distribution of the children under five by sex

Sex	Control		Intervention	
	n	%	n	%
Male	20	64.5	44	47.3
Female	11	35.5	49	52.7

Characteristics of the children under five are presented in Table 11.2. The characteristics presented includes age, newborn body weight, newborn body length, body weight at the baseline, and body height at the baseline.

The average ages of the male children under five in the control group and in the intervention group were 19.4 and 21.1 months respectively. For the male children the average ages in the control group and in the intervention one were 17.0 and 20.2 months, respectively.

The average newborn body weights among the male children in the control group and in the intervention one were 3.1 and 3.1 kgs, respectively. These body weights belong to 'normal'. This is according to Depkes (2010), which states that the normal newborn body weight ranges from 2.5 to 4 kgs.

The average newborn body lengths of the male children in the control group and in the intervention one were 49.3 and 46.8 cm, while among the female

children the newborn body lengths were 49.3 and 45.0 cm in the control group and in the intervention one, respectively. The newborn body length of the children in the control village belongs 'normal', while the newborn body length of the children in the intervention villages belong to 'below normal'. This is because according to Depkes (2010), the normal newborn body length ranges from 48 to 52 cm.

The body weights of the male children in the control group and in the intervention group were 10.3 and 10.2 kgs, respectively at the baseline, while among the female children their body weights were 9.3 and 9.0 in the control group and in the intervention one, respectively. The body weight of the children in the control group was higher than that in the intervention group at the baseline.

At the baseline the body heights of the male children in the control group and in the intervention one were 76.4 and 77.7 cm, respectively, while among the female children were 73.9 and 74.9 cm in the control group and in the intervention one respectively. The body height in the intervention group was higher than that in the control group at the baseline.

Table 11.2 Characteristics of the children under five

Characteristics of the children under five	Control	Intervention	Total
Age of the children under five (month)			
- Male	19.4 ± 10.4	21.1 ± 10.2	20.5 ± 10.2
- Female	17.0 ± 8.0	20.2 ± 12.2	19.6 ± 11.6
Newborn body weight (kg)			
- Male	3.4 ± 0.6	3.5 ± 0.9	3.4 ± 0.8
- Female	3.1 ± 0.8	3.2 ± 0.8	3.2 ± 0.8
Newborn body length (cm)			
- Male	49.3 ± 0.5	46.8 ± 4.6	48.0 ± 3.3
- Female	49.3 ± 1.0	45.0 ± 5.0	46.1 ± 4.7
Current body weight (kg) (baseline)			
- Male	10.3 ± 1.7	10.2 ± 1.9	10.2 ± 1.8
- Female	9.3 ± 2.3	9.0 ± 2.1	9.1 ± 2.1
Current body height (cm) (baseline)			
- Male	76.4 ± 10.2	77.7 ± 10.0	77.3 ± 10.0
- Female	73.9 ± 9.0	74.9 ± 11.0	74.7 ± 10.6

11.2 Nutritional Status

Nutritional status is stated in a body weight for age (WAZ), body height for age (HAZ), and body weight for height (WHZ). The index of WAZ explains a whole malnutrition. The index of HAZ explains chronic malnutrition. The index of WHZ explains acute malnutrition. The nutritional status of the children by the kinds of index and treatment is presented in Table 11.3.

For the index of the body weight for age (WAZ), the mean Z-scores of the children in the control group were -0.38 and -1.12 at the baseline and at the endline, respectively, while in the intervention group -0.76 and -1.27 at the baseline and at the endline, respectively. These results showed that there was a decrease in the nutritional status during the intervention period. This condition was in line with the results of Riskesdas 2010 (Kemenkes 2011) which showed that there was a decrease of the nutritional status (WAZ) in line with the increasing age of the children under five.

Table 11.3 Distribution of the children by the weight for age (WAZ) and treatment group

Nutritional status by WAZ	Control (n=31)				Intervention (n=93)			
	Baseline		Endline		Baseline		Endline	
	n	%	n	%	n	%	n	%
Z-score < -2 Sd (underweight or severe)	3	9.7	4	13.3	13	14.0	18	19.8
Z- score > +2 (overweight)	1	3.2	0	0.0	2	2.2	0	0.0
-2 Sd > Z-Score < +2 Sd (normal)	27	87.1	26	86.7	78	83.9	73	80.2
Mean Z-score ± Sd	-0.38 ± 1.40		-1.12 ± 1.00		-0.76 ± 1.26		-1.27 ± 0.88	
p-value of t test (paired t- test)	0.006				0.000			
Delta	-0.79 ± 1.45				-0.50 ± 1.31			
p-value of t test (independent t-test)	0.299							

The worse nutritional status could also be observed at the increase of the underweight prevalence in the control group and in the intervention group. The question is why the nutritional status of the children got worse. In fact, when born (See Table 11.2) and at the baseline their nutritional status belonged to 'normal'. The result of the multiple linear regression analysis

showed that the energy adequacy level, the vitamin A adequacy level, and the *Posyandu* participation were factors which influenced the nutritional status of the children under five (WAZ). The children's low nutritional intakes (their quantity and quality) may make their nutrient need not fulfilled according to the growing age of the children so this may decrease their nutritional status. In addition, their environment or health which is not good may disturb the metabolism and utilization of the nutrients. The adequate consumption of vitamin A is important to increase their body immunity so that the children are not easily sick.

Table 11.4 Linear regression analysis of the nutritional status (WAZ) by the stepwise method

Variables	Unstandardised coefficients	Standardized coefficients	T	p-value
	B	Beta		
Constant	-4.318		-8.921	0.001
The energy adequacy level	0.009	1.114	8.609	0.001
The vitamin A adequacy level	0.007	0.632	6.464	0.003
<i>Posyandu</i> participation	0.138	0.607	3.929	0.017

Notes: R=0.990; R²=0.979; Adjusted R²=0.964; F=62.746; p=0.001

The *Posyandu* participation was a supporting factor which may affect the children's nutritional status. The mothers who routinely visited *Posyandu* were able to monitor the growth and development of their children every month. The result of weighing the children's body weight was recorded in a book of KIA (*Kesehatan Ibu dan Anak*—the health of the mother and her child) or in *Kartu Menuju Sehat* (KMS)—a card to monitor body weight, whether it increases or not. Children under five are called their growth increase if their growth line increases following one of the coloured line in the KMS and/or their growth line moves to the coloured line above it. Thus, the mothers are able to recognize and prevent the growth impediment of their children early. Besides that, at *Posyandu*, the mothers get a nutritional and health extension. The mothers' knowledge on nutrition and health will affect very much the nutritional condition of the household, particularly of the children under five.

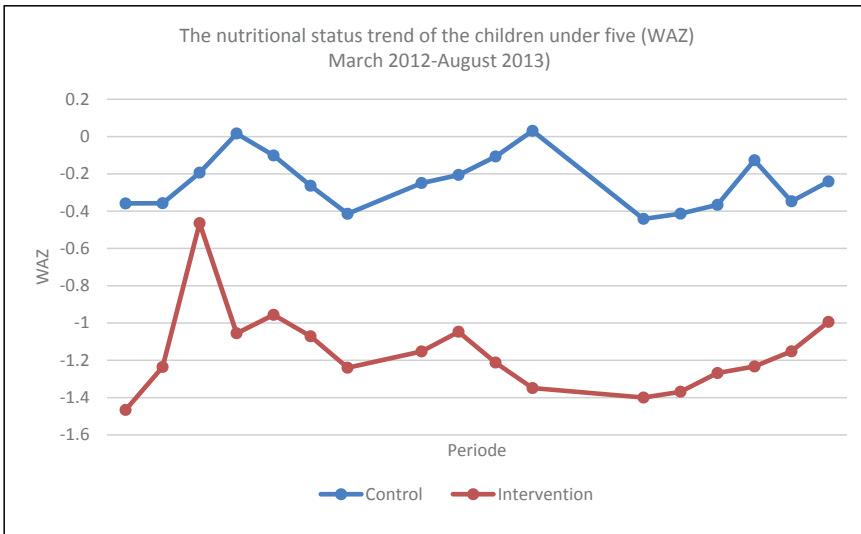
Acute malnutrition can be seen from the body height for age (HAZ). In Table 11.5 it can be seen that at the baseline the means of Z-scores still belonged to 'normal' in the control group and in the intervention group, that is, -0.66

Table 11.5 Distribution of the children by the height for age (HAZ) and treatment group

Table 11.6 Distribution of the children by the weight for height (WHZ) and treatment group

Nutritional status by WHZ	Control (n=31)				Intervention (n=93)			
	Baseline		Endline		Baseline		Endline	
	n	%	n	%	n	%	n	%
Z-score < -2 Sd (wasting)	1	3.2	2	6.7	7	7.5	6	6.6
Z- score > +2 (overweight)	3	9.7	2	6.7	2	2.2	3	3.3
-2 Sd >Z-Score<+2 Sd (normal)	27	87.1	26	86.7	84	90.3	82	90.1
Mean of Z-score ± Sd	0.14 ± 1.46		-0.17 ± 1.37		-0.44 ± 1.25		-0.37 ± 1.27	
p-value of t-test (paired t- test)	0.248				0.550			
Delta	-0.33 ± 1.54				0.08 ± 1.89			
p-value of t-test (independent t test)					0.158			

Acute malnutrition (WHZ) still belonged to ‘acceptable’ at the baseline based on the criteria of the severe community-health problem according to WHO (WHO 1995). The means of the Z-scores WHZ in the control group at the baseline and at the endline were 0.14 and -0.17, respectively, and in the intervention group -0.44 and -0.37, respectively. Based on the means of the z-scores it is known that the acute malnutrition was not a community health problem. However, if it is viewed from the wasting prevalence at the end of the intervention, 6.7% in the control group and 6.6% in the intervention one, it is known that the community health problem belonged to ‘poor’.



Picture 11.1 The trend of the children’s nutritional status (WAZ)

The trend of nutritional status (WAZ) was observed every month within more than one year during the weighing of the children at *Posyandu*. The result is presented in Figure 11.1. In the figure it is observed that in the control group and in the intervention one the nutritional status tended to be stable in line with the increasing age. The nutritional status of the control group was better than that of the intervention group but the trend patterns were relatively similar. If it is viewed throughout the year, January was the lowest point of the nutritional status in both of the groups (control and intervention). The

month was the peak of the rainy season and morbidity usually (cough, flu, diarrhea and blood fever) also increased. The low nutritional status had a correlation with the increase of the morbidity in the rainy season.

11.3 Health Status

The history of diseases which is presented in Table 11.7 is the respondents' perception towards the diseases their children suffered from, not a diagnostic result of the medical staff. In Table 11.7 it is seen that the history of the diseases which many children had suffered from since they were born were smallpox (because Bogor was an endemic area of smallpox) and measles. Smallpox according to Kurniawan *et al.* (2009) is an infectious disease which is caused by virus *Varicella zoster*. Vaccination has proved to be effective in providing protection against the virus. Lestari *et al.* (2009) also stated that measles immunization is still effective to prevent measles and its complication. Therefore, this disease should be able to be avoided if the parents are active taking their children to *Posyandu* or other health service providers in order to be immunized.

Table 11.7 Distribution of the diseases the children under five suffered from since born

Kinds of diseases	Control		Intervention		Total	
	n	%	n	%	n	%
Smallpox	5	16.1	22	23.7	27	21.8
Lung infection	1	3.2	4	4.3	5	4.0
Measles	16	51.6	28	30.1	44	35.5
Typhus	1	3.2	3	3.2	4	3.2

The kind of diseases that many children suffered from within the last month starting from the highest to the lowest was upper respiratory tract diseases (cough, having a cold), fever, and diarrhea. The distributions in the control group and the intervention one were relatively similar. The diseases were generally contagious diseases. In addition, Wati (2005) stated that the prevalence of acute respiratory track infection had a significant correlation with the growth of 3–6 month-old infants. These diseases were closely related with their poor nutritional condition and behaviour.

Table 11.8 Distribution the diseases the children under five suffered from in the last month

Kinds of diseases	Control		Intervention		Total	
	n	%	n	%	n	%
Diarrhea	14	45.2	40	43.0	54	43.5
Fever	23	74.2	69	74.2	92	74.2
Upper respiratory tract infection (cough, having a cold)	28	90.3	76	81.7	104	83.9
Skin diseases	0	0.0	17	18.3	17	13.7
Others	2	6.5	3	3.2	5	4.0

The length of the diseases the children suffered from in the last one month commonly ranged from two to five days. The longer duration was usually for an Acute Respiratory Tract Infection (Table 11.9). However, the length of the infection the children suffered from either in the control group or in the intervention one still belonged to 'normal' as Lubis *et al.* (1990) state that according to the definition of Depkes Acute Respiratory Tract Infection is an infection of the respiratory tract which lasts up to 14 days.

Table 11.9 Distribution of the lengths (day) of the diseases of the children under five by kind of diseases in the last one month

Kinds of Diseases	Control	Intervention	Total
Diarrhea	2.7 ± 1.5	3.8 ± 2.0	3.5 ± 2.0
Fever	3.2 ± 2.6	3.4 ± 2.0	3.3 ± 2.2
Acute respiratory tract infection (cough, having cold)	5.3 ± 5.6	4.7 ± 2.7	4.9 ± 3.7
Skin diseases	-	9.9 ± 10.6	9.9 ± 10.6
Others	3.0 ± 1.4	6.3 ± 6.7	5.0 ± 5.1

The frequency of having the diseases within the last one month is presented in Table 11.10. In the table it is observed that the frequency of having all of the diseases which were identified ranged from one to two times. A study conducted by Elyana and Candra (2013) found that there was a correlation between the frequency of having the acute respiratory tract diseases with the nutritional status of the children under five. The greater the frequency of having the acute respiratory tract infection is, the poorer the nutritional status of the children under five is. Therefore, the improvement of the nutritional status can prevent the children from the acute respiratory tract infection.

Table 11.10 Distribution of the frequency of having the diseases during the last one month (time)

Kinds of diseases	Control	Intervention	Total
Diarrhea	1.1 ± 0.4	1.3 ± 0.4	1.2 ± 0.4
Fever	1.3 ± 0.6	1.6 ± 1.0	1.5 ± 0.9
Acute respiratory tract infection (cough, having cold)	1.3 ± 0.5	1.4 ± 0.9	1.4 ± 0.8
Other diseases	-	1.7 ± 1.5	1.7 ± 1.5
Others	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0

Sustainability of the Program

Posyandu is an institution of the nutritional program implementation in Indonesia. The beginning of *Posyandu* as stated by Soekirman (2000), started from the activities of Applied Nutrition Program (ANP). The ANP which was established in 1963 at the beginning was only implemented in some provinces in Indonesia, namely, Java, Sumatera, Bali, and Nusa Tenggara Barat. The ANP was formulated as an educative endeavour to improve the community nutrition, particularly the vulnerable group by involving the local community participation as well as supports from a variety of institutions coordinately.

Around 1973 the ANP was changed into Program Usaha Perbaikan Gizi Keluarga (UPGK)—A Program of Family Nutritional Improvement Efforts—which was the beginning of *Posyandu* establishment and indicated by the establishment of several weighing posts for children under five. Next, through Repelita II (a Five-Year Development Plan) the UPGK was then included in an Indonesian national which was continual (Soekirman 2000). After several times *Posyandu* emerged as a national movement and also as a spearhead of a nutritional and health service for the entire Indonesian community. In 2012 the number of *Posyandus* were estimated approximately 276,392.

Quantitatively, the *Posyandus* are able to move the community to be more aware of nutrition. Once a month the *Posyandus* provide a nutritional and health service to the community, especially to the children under five, pregnant mothers and breastfeeding mothers. As an institution of nutritional and health services at the grassroot level, it is proper if *Posyandu* is considered as an institution which really knows the condition of the community nutrition. This is in line with Soedirham's opinion (2012), that *Posyandu* is

a sociostructural approach in the community health service as a strategy to improve the community health status. The appearance of nutritional problems in the community can be quickly identified if the local *Posyandu* has run well. Besides that, early detection on the nutritional problem can also be carried out through *Posyandu* considering that one of the *Posyandu* services is to monitor the child growth every month.

So far the *Posyandus* in Indonesia have provided various kinds of nutritional and health services to the community, such as: the weighing of children under five to monitor their growth every month, vaccination/immunization, nutritional extension, provision of supplementary foods for children under five etc. The presence of the program for the increase of the number of medical staff at *Posyandus*, particularly village midwives as well as cadres in Indonesia has also contributed in decreasing the maternal mortality rate (MMR) as well as the neonatal mortality rate even though the decrease achieved has not showed a significant figure, that is, the maternal mortality rate > 400 per 100,000 live births as well as the neonatal mortality rate of 32 per 1,000 live births in 1993 to be 307 maternal deaths per 100,000 live births and 20 neonatal deaths per 1,000 live births in 2003 (Dawson 2010). The data of Riskesdas (2007) showed the maternal mortality rate was as many as 228/100,000 live births and the neonatal mortality was 34/1,000 live births. A study conducted by Sartika (2002) mentioned that the *Posyandus* available at present, particularly in Bogor District had owned a good organization structure completed with a job description for each section.

Intervention of the nutritional education for the mothers and *Posyandu* cadres have an important and potential effect in changing the knowledge, attitude, and practice of the nutrition among the mothers of children under five in order to improve the nutritional status of the children. Mothers hold a crucial role in improving their children's nutritional status. In fact, the food patterns of the children almost entirely depend on the capability of the mothers to transfer their nutritional knowledge into their attitude and good eating practice. Whereas, the *Posyandu* cadres also hold an essential role in the success of the *Posyandu* service. It is stated by Depkes (1999) that the success of a *Posyandu* implementation in a community is affected by several interconnected factors, one of which is the adequacy as well as the quality of the cadres.

The subjects of this action-research activity were the mothers and *Posyandu* cadres in the subdistrict of (*Kecamatan*) Tamansari, Bogor. The research team,

from the beginning, have involved the stakeholders who are expected to be able to keep the sustainability of this program. Because the designed program is connected with the utilization of the yards (home gardening) and *Posyandu* empowerment, this action research deeply involved agricultural extension workers, village midwives, as well as nutritional cadres in the *Posyandu*.

Each of the agricultural extension workers in this action research activity was responsible for the implementation of a yard utilization in one village. During the implementation of this activity, the agricultural extension workers together with the research team of the Bogor Agricultural University (IPB) routinely supervised the mothers who became this action research participants. The supervision carried out was connected with the introduction of technical aspects in the implementation of the yard utilization as well as monitoring the harvests.

The agricultural extension workers as officers of the Agricultural Department work daily in villages to guide the farmers. Each of the agricultural extension workers works in one to three villages which are close to one another. With this yard utilization activity, the agricultural extension workers were also responsible to assist this activity to develop the yards in order to reduce the vegetable expenditures in the households of the action research participants.

The IPB research team had explained the importance of monitoring the sustainability of the yard utilization activity after this action research to the agricultural extension workers. Since so far the agricultural extension workers, in fact, work in villages, the monitoring of the yard later can be carried out by the agricultural extension workers together with the implementation of their daily duties.

The agricultural extension workers involved in this action research are graduates in the agricultural field, who are usually able to explain the technical aspects of agricultural cultivation by using simple language which is easy to be understood by the community. Therefore, the IPB team are confident that the involvement of the agricultural extension workers in this action research is a right step to be able to guarantee the sustainability of the yard utilization program.

The activity of the yard utilization is mainly directed to gain products, that is, vegetables, which can be consumed as well as can fulfill the nutritional needs of the households. With the yards around the house, the household mother participants of this action research are expected to be able to reduce the food

budget because the vegetables must not be obtained by buying but they can be obtained by harvesting in the yard.

This action research conducted by the IPB team is a form of attention to the importance of revitalizing the yard-area utilization program. The yard area can be a production factor in the households. The yard utilization is likely to be able to increase the vegetable consumption of the household members as well as to be able to economize on the expenditure or the household expenses.

The activities of the yard utilization carried out by the mother participants of the *Posyandu* are an important step in order to attain better nutrition for the household members. *Posyandu* which is the spearhead of the community nutritional service should not only be focused on the health, but also must be able to move the mother participants to develop agriculture in a form of the yard utilization around the house. The core of the household food provision through the yard utilization activity is in order that the household members have an access to vegetables for their consumption.

This action research, in addition to involving the agricultural extension workers, also involved the nutritional cadres and village midwives, so it is expected with the availability of the medical staff, the continuity and the sustainability of the program can be maintained. The nutritional cadres so far intensely provide nutritional and health services to the mothers and children under five of the *Posyandu* members. Therefore, the role of the nutritional cadres after this action research is expected to keep on going continually.

The monthly activity of the cadres is holding the nutritional program activity at *Posyandu*. The *Posyandu* cadres have a duty to weigh the children under five every month to monitor the children's growth, to provide supplementary foods, as well as to hold a nutritional extension to the mothers of children under five. The immunization and vaccination are also held at the *Posyandu* but they are handled by the village midwife.

This action research has also empowered the cadres through a nutritional training to improve the nutritional knowledge of the cadres. Thus, it is expected that the nutritional cadres are increasingly able to implement the extension activity at the time of holding the *Posyandu* programs which are routinely carried out every month. The cadres' ability in understanding the nutritional messages is an important skill for a better implementation of the *Posyandu* program.

The program sustainability will very much rely on a continual monitoring done after the action research. In this monitoring program, reinforcement of the program implementation such as extension to the *Posyandu* participants or intensification of the yard utilization can be increased in its quality. Considering that the agricultural extension workers as well as the nutritional cadres have in fact done their activities in the villages, the sustainability of this program is expected to be able to remain maintained.

13

Conclusions and Recommendations

13.1 Conclusions

1. Participation of the community in the *Posyandu* activities is very important as an effort for the improvement of the basic health and nutritional status, particularly among the children under five. Almost all of the mothers of children under five (97,6%) stated that the existence of *Posyandu* was very important for them. The factors influencing the community participation are internal and external factors. Internally, the condition, situation and motivation of the mothers of children under five influenced the frequency of their visit to *Posyandu*. Not all of the mothers of children under five routinely visited *Posyandu* every month. The reasons, among others, are: being occupied, laziness, the children did not want to be taken to *Posyandu* or they were sick, being afraid that their children got fever after immunization, and being ashamed if their children's body weight decreased. The main motivation of the mothers of children under five visiting *Posyandu* is in order that their children grow healthily, get immunization/vitamin A, and their children's body weight is monitored.

The activities of the *Posyandu* implementation are such as provision of supplementary foods, preparation of the place, discussion on the *Posyandu* problems etc., which were done by the *Posyandu* cadres. Thus, basically the cadres have carried out the process of preparation or planning, implementation up to evaluation of the *Posyandu* activities.

The external factors which are in forms of supports from the *Posyandu* stakeholders, the availability of *Posyandu* facilities, and counselling

activities are also very important in encouraging the community to participate in *Posyandu*. The cadres are the most essential stakeholders in encouraging the mothers of children under five to visit *Posyandu*, however their number and their performance were still limited. The cadres have actively given information to the mothers of children under five on the schedule of the *Posyandu* activities and invited them to come to *Posyandu*, prepared supplementary foods and *Posyandu* equipments, weighed the children/pregnant mothers, and recorded all connected with the *Posyandu* activities. The other stakeholders who play a role in the *Posyandu* activities, among others, are: midwives, the RT leaders (the smallest subvillage), family planning counsellors, officers from *Puskesmas* (the community health center), religious figures, and village leaders. Supports from the husbands or parents also played a role in encouraging the mothers of children under five to visit *Posyandu*.

PMT (Supplementary Feeding Program) is one of powers of attraction which is able to increase the community interest to have their children weighed at *Posyandu*. However, the PMT was not routinely held with the reason that the budget allocated by the government was not sufficient to provide the supplementary foods routinely every month. A collective contribution system from the mothers of children under five was not available to provide supplementary foods in the research villages.

The presence of extension activities also motivated the mothers of children under five to visit *Posyandu*. Therefore, empowering the cadres to understand nutrition and health better is of paramount importance, so they can become reliable counsellors at their *Posyandu*. The nutritional training conducted during the intervention program in this action research is a real step to the empowerment of the *Posyandu* cadres.

The adequacy and completeness of the *Posyandu* facilities/infrastructure also motivated the mothers of children under five to visit *Posyandu*, because they improved the comfort and promptness in service. However, almost all of the *Posyandus* still faced problems of the availability for the facilities. Some of them were permanent *Posyandu* buildings were not available and therefore most of the *Posyandus* used the house of one of the cadres; the availability of weighing scales, microtoise, tables, chairs, as well as divan and mattress for the examination of the pregnant mothers was also limited.

2. The villages which became this research site had a relatively fertilized land texture so the activity of yard utilization was potential to develop. On average the control and intervention groups possessed a narrow yard ($<120 \text{ m}^2$). The average of the land area under control in the intervention group was approximately 32 m^2 per household, in details Sukaresmi Village 44.1 m^2 , Sukaluyu Village 23.6 m^2 , and Sukajaya Village 11.9 m^2 .

Based on the baseline data it is known that the yards in the research site had not been maximally utilized, most of the land around the house had not been utilized or left empty. In the three intervention villages the number of the households which utilized the yards to cultivate vegetables was 30.1%, tubers 25.8%, and decorative plants 23.7%. Whereas, in the control village the number of the households which utilized their yards for decorative plants 25.8%, vegetables 19.4%, and tubers 12.9%. This low utilization was because the households did not have plant seeds/seedlings, did not have time and were occupied taking care of their house as well as their children, did not know how to plant, and other various reasons.

3. The intervention in a form of nutritional extension resulted in a positive impact in the case of nutritional knowledge. The trend of the nutritional knowledge increase was observed in the intervention group, where the number of the mothers who gained nutritional knowledge categorized as 'good' increased. In the intervention group the score of the mothers' nutritional knowledge increased as many as 12.4 on average, while in the control group the increase was just 1.8. The increase of the nutritional knowledge score in the intervention group was significantly higher than that in the control group ($p < 0.05$).

In regard to the nutritional knowledge of the cadres, the number of the cadres in the intervention group whose nutritional knowledge was categorized as 'good' increased from 14.3% to 78.6%. Statistically the nutritional knowledge increase of the cadres in the intervention group was significantly higher than that in the control group ($p < 0.05$).

Concerning with the nutritional attitude, in the intervention group it increased as many as 6.9. The result of the t-test showed that there is a significant different ($p < 0.05$) between the nutritional attitude score increase of the mothers in the intervention group and that of the mothers

in the control group, where the mothers in the intervention group gained higher scores of the nutritional attitude. On the other hand, among the cadres it was not found that there was a significant difference between the nutritional attitude score in the control group and that in the intervention group ($p>0.05$).

Nutritional attitude was relected in several things connected with eating habits. In the intervention group the increase in the number of the children who consumed vegetables in the households of the mothers of children under five reached 11.0%, while in the control group the increase was less than 9%. The majority of the mothers, either in the control group or in the intervention one provided tofu/tempeh for their children. The increase occurred both in the control group and in the intervention one, but the increase was higher in the intervention group. The number of the mothers in the control group who stated that their children were accustomed to having breakfast increased approximately 9.3%, while in the intervention group the increase reached 15.8%. The significant increase (35.8%) in having breakfast also occurred in the households of the cadres in the intervention group.

4. The action-research activity which is a nutritional education has been able to improve the nutritional knowledge of the mothers of children under five and also of the *Posyandu* cadres. The importance of the nutritional education in a long term is to improve the eating habit which at the end can improve the nutritional status of the children. *Posyandu* cadres as the spearhead of the nutritional service at the community level play an important role in preventing the spread of nutrition deficiency particularly among the children under five. Therefore, the empowerment of the cadres in a form of nutritional education and training on optimizing the *Posyandu* services need to be done. The increasingly good quality of *Posyandu* is reflected in one of its quality elements, that is, the increase of the cadres' ability in giving a nutritional program service for children under five. It is expected that the cadres who are increasingly skillful will be able to attract the community to participate in the *Posyandu* nutritional program constantly so the nutrition deficiency among the children under five can be overcome better.

The equipments possessed by the *Posyandus* to operate the nutritional service program were still limited. In this action research the *Posyandus* in the research site which have been facilitated by a collaborative project,

the Nestle Foundation-Bogor Agricultural University, with various kinds of facilities to support the *Posyandu* operation, such as media for nutritional extension (*poster*, flipchart, module, and leaflet), tables, chairs, divan, mattress, weighing scale, microtoise etc. It is expected, with the equipments/facilities which are more complete, the *Posyandus* are able to provide better nutritional services.

5. Increasing the community participation in the *Posyandu* activities can be done by solving the *Posyandu* problems which are rooted from the internal and external factors as have been explained in point 1. Internally, in this action research some efforts to motivate the mothers of children under five to come to *Posyandu* routinely have been done. Therefore, the research team together with the *Posyandu* cadres in the activities of the nutritional extension have emphasized the importance of *Posyandu* for the growth and development of children and the need of the community to utilize *Posyandu* as nutritional and health services for children.

The performance of the *Posyandu* cadres was still limited, therefore the research team held trainings on health, nutrition, and optimizing *Posyandu* services. With the trainings it is expected that the *Posyandu* services get better so this is able to encourage the community to be willing to participate in the *Posyandu* activities.

The role of the community figures is very crucial in increasing the community participation in *Posyandu*. Therefore, it has been conducted socialization on the programs connected with the development of *Posyandu* to the community figures, and improvement of their understanding on the importance of *Posyandu* for the community. Thus, their concerns will emerge to develop *Posyandu* and they also pay attention to the health and quality of the community life, particularly among children under five. It is expected that with high understanding and concerns, the formal and informal figures are able to convince the community members on the importance of their participation in the *Posyandu* which is held once a month in each village.

The community participation in the *Posyandu* activities is also influenced by the availability and completeness of the *Posyandu* facilities. The facilities which are complete and of good quality improve the comfort and promptness in giving services to the mothers at the *Posyandu*. However, in fact the *Posyandus* in the research site still possessed limited facilities.

The research team made an endeavour to overcome the problems by giving facilities as have been mentioned in point 4 so it is expected that the *Posyandu* services can be better.

6. In the activity of the yard utilization (home gardening) in the research site there were 15 kinds of vegetables which were planted, namely, small-sized chilli, *katuk*, spinach, *kangkung*, string bean etc. The kinds of vegetables which were easily planted were spinach, *kangkung*, and *caisin*. Most of the respondents felt pleased with the yard-utilization (home gardening) program because they got guidance, direction, and enough facilities to develop their yard, as well as their harvest can be used to fulfill their household needs without spending any money to buy vegetables.

During the period of April 2012 to June 2013 the highest productions of vegetables in the yard were *caisin* in Sukaresmi Village (about 150 kgs), tomato in Sukaluyu Village (about 155 kgs) and in Sukajaya Village (about 100 kgs). Other vegetables whose production was also caterogized as 'high' were spinach, cucumber, bitter melon, *kangkung*, chilli, and eggplant. These vegetables whose production was high indicate that the vegetables are suitable to be planted in the yard and are potential be recommended to other households to plant.

The trend of the total vegetable harvest in the three intervention villages has a nearly similar pattern. In the period of April to September 2012 the harvest increased, then in October to December 2012 decreased due to the dry season, and in January to June 2013 the harvest increased again.

The role of the cadres in the yard utilization program helped very much in the field; this was connected with an effort to maintain/build the respondents' motivation. Most of the cadres in the three villages were enthusiastic to the program sustainability, even though in the course there were some of the cadres who were less active in the field because of their business or other factors. Interest and motivation were two of the factors which affect the yard utilization. Strong interest and motivation will make the community easy to utilize their yard optimally because the yard need to be taken care so that it has a continual production.

13.2 Recommendations

1. To maintain the sustainability of the collaborative program between the Nestle Foundation and Bogor Agricultural University, it is necessary to

monitor and supervise for the next one year. A visit by the monitoring research team to the respondents' household who became the participants of this action-research is expected to be able to motivate the mothers to visit *Posyandu* routinely every month to monitor the growth of their under-five-year-old children. In addition, the supervising visit of the research team to the *Posyandus* should also be able to help the cadres to find a solution for coping with the nutritional problems of the community and to optimize the *Posyandu* services.

2. The empowerment of the *Posyandu* cadres which has been done by the research team is expected to be able to open their insight so that the cadres can have more access to the resources available in each of their villages, especially connected with the financing and procurement of the facilities to operate the *Posyandu* better. In the collaborative activities, the Nestle Foundation-Bogor Agricultural University, the empowerment has been done to the *Posyandu* stakeholders, such as the village leaders, the *Puskesmas* staff, the village midwives, and informal leaders, so that the importance of *Posyandu* will be increasingly realized, and it is expected that they are able to give a contribution to the improvement of the *Posyandu* services.
3. PPL (the agricultural extension workers) are expected to keep on guiding the participants of the yard utilization program and also to extend their reach so that the participation of the community in the surrounding research site increases. So far, the PPL just do their duties in the villages to assist the farmer to get a maximum production. It is expected that a further assistance from the PPL is able to keep the mothers to take care of their yard plants constantly so that the harvest from their yard can be consumed or can reduce their budget for buying vegetables.

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15

Appendices

Appendix 1 The percentage of the mothers of children under five answering the nutritional knowledge items correctly

Nutritional Knowledge		Control				Intervention			
		Baseline		Endline		Baseline		Endline	
		n	%	n	%	n	%	n	%
BASIC NUTRITION									
1.	Our daily foods can also be useful to improve the body stamina. (T)	29	96.7	30	100.0	81	96.4	80	96.4
2.	Milk, fish, and tofu are sources of animal protein. (F)	10	33.3	8	26.7	26	31.0	19	22.9
3.	The source of vitamin and mineral is rice. (F)	15	50.0	13	43.3	18	21.4	29	34.9
4.	Obese children will not arouse malnutrition. (F)	18	60.0	12	40.0	36	42.9	47	56.6
5.	Children who are thin and their face is wrinkled are children of poor nutrition which are called kwashiorkor. (F)	8	26.7	6	20.0	25	29.8	34	41.0
6.	One kind of food belonging to protein sources is tofu. (T)	26	86.7	27	90.0	71	84.5	71	85.5
7.	The drinking water need a day is four glasses. (F)	18	60.0	15	50.0	36	42.9	67	80.7
8.	Frying oil is a source of fat, and so is avocado. (T)	20	66.7	21	70.0	63	75.0	63	75.9
9.	Foods of a energy source is rice, of a building source is fish, and of a regulating source is cassava. (F)	4	13.3	5	16.7	7	8.3	12	14.5
10.	Food containing much iron is rice. (F)	7	23.3	6	20.0	16	19.0	30	36.1

Appendix 1 The percentage of the mothers of children under five answering the nutritional knowledge items correctly (cont.)

Nutritional Knowledge	Control				Intervention			
	Baseline		Endline		Baseline		Endline	
	n	%	n	%	n	%	n	%
NUTRITION FOR CHILDREN UNDER FIVE								
11. Breastmilk coming out at the first time is called colostrum. (T)	26	86.7	30	100.0	76	88.4	82	95.3
12. Exclusive breastfeeding should be given to infants up to four months old. (F)	6	20.0	7	23.3	30	34.9	47	54.7
13. Honey and water can be given to a newborn baby. (F)	9	30.0	9	30.0	22	25.6	75	87.2
14. Complementary feeding is given to children > six months old. (T)	28	93.3	29	96.7	76	88.4	73	84.9
15. Breastfeeding can create an affection between the mother and baby. (T)	29	96.7	29	96.7	83	96.5	83	96.5
16. Introduction to the household food can be given when the child is nine months old. (F)	10	33.3	6	20.0	25	29.1	44	51.2
17. Breastmilk is as good as formulated milk. (F)	18	60.0	22	73.3	44	51.2	59	68.6
18. Provision of supplementary food to breastmilk to the child who is less than 6 months old may cause obesity to the child. (T)	17	56.7	24	80.0	53	61.6	53	61.6
19. Breastmilk is enough to be given to a child up to 1 year. (F)	20	66.7	14	46.7	49	57.0	67	77.9
20. Breastmilk may cause an allergy. (F)	28	93.3	26	86.7	70	81.4	66	76.7

Appendix 1 The percentage of the mothers of children under five answering the nutritional knowledge items correctly (cont.)

Nutritional Knowledge	Control				Intervention			
	Baseline		Endline		Baseline		Endline	
	n	%	n	%	n	%	n	%
FOOD SELECTION FOR CHILDREN UNDER FIVE								
21. If a child does not want to eat, s/he may be forced or angered. (F)	22	73.3	20	66.7	43	56.6	64	87.7
22. Children should be persuaded to eat while watching TV. (F)	10	33.3	10	33.3	24	31.6	63	86.3
23. Children should be given a chance to select a menu. (T)	22	73.3	26	86.7	67	88.2	69	94.5
24. Snacks may be given to children between the time for breakfast and lunch. (T)	17	56.7	21	70.0	42	55.3	46	63.0
25. <i>Ciké</i> -like foods are good to be given as snacks for children. (F)	26	86.7	26	86.7	62	81.6	65	89.0
26. Milk is a source of calcium which is good for the growth of child's skeleton. (T)	28	93.3	29	96.7	71	93.4	67	91.8
27. Sweet condensed milk is as good as formulated milk. (F)	16	53.3	17	56.7	39	51.3	44	60.3
28. Prior to preparing milk for her child, the mother does not need to wash hands since using a spoon. (F)	24	80.0	24	80.0	56	73.7	61	83.6
29. Breastmilk contains nutrients which are good for the growth of the child's brain. (T)	30	100.0	30	100.0	70	92.1	72	98.6
30. The characteristics of fresh fish are its gills are red, and its eyes are pale. (F)	22	73.3	24	80.0	41	53.9	47	64.4

Appendix 1 The percentage of the mothers of children under five answering the nutritional knowledge items correctly
(cont.)

Nutritional Knowledge		Control			Intervention		
		Baseline	Endline		Baseline	Endline	
		n	%	n	%	n	%
BASIC SANITATION							
31.	Each house must have its own toilet. (T)	26	86.7	29	96.7	72	97.3
32.	The requirement of healthy water is its colour is clear, not turbid. (T)	30	100.0	30	100.0	74	100.0
33.	Dysentery and suffering from intestinal worms among children occur due to defecating anywhere. (T)	20	66.7	24	80.0	53	71.6
34.	Feces and waste water may be flowed to a fishpond. (F)	22	73.3	19	63.3	34	45.9
35.	Plastic belongs to organic waste. (F)	13	43.3	17	56.7	35	47.3
36.	Throwing rubbish into the river does not make any problem. (F)	27	90.0	27	90.0	52	70.3
37.	A wound/ulcer may become a source of contamination coming from the body. (T)	21	70.0	24	80.0	64	86.5
38.	Used paper belongs to organic waste. (T)	21	70.0	15	50.0	44	59.5
39.	Tasting a food which is being cooked can use the pointing finger. (F)	16	53.3	20	66.7	43	58.1
40.	Before spoonfeeding children under five, it is enough washing hands without soap. (F)	26	86.7	25	83.3	56	75.7

Appendix 1 The percentage of the mothers of children under five answering the nutritional knowledge items correctly (cont.)

Nutritional Knowledge		Control				Intervention			
		Baseline		Endline		Baseline		Endline	
		n	%	n	%	n	%	n	%
FOOD SAFETY									
41.	Foods should be cooked until they are well done, not half-cooked. (T)	23	76.7	22	73.3	59	86.8	60	89.6
42.	Meat which has been soft and rather smelly can still be consumed. (F)	27	90.0	30	100.0	64	94.1	64	95.5
43.	Essense is a synthetic food coloring which can be used in food. (T)	10	33.3	5	16.7	24	35.3	47	70.1
44.	Vegetables or fruits may directly be eaten without being washed first. (F)	29	96.7	28	93.3	61	89.7	59	88.1
45.	Used newspaper is not good for wrapping foods. (T)	16	53.3	23	76.7	43	63.2	43	64.2
46.	<i>Pijer</i> (a kind of food additives) can be used to make <i>ketupat</i> (boiled rice wrapped in coconut leaves) or <i>lontong</i> (boiled rice wrapped in a piece of banana leaf). (F)	21	70.0	22	73.3	39	57.4	62	92.5
47.	Rhodamin B (a textile dye) contains in many kinds of snacks for children. (T)	21	70.0	25	83.3	48	70.6	51	76.1
48.	Child snacks with bright colors can be consumed. (F)	28	93.3	29	96.7	55	80.9	59	88.1
49.	Food additives which can be consumed are tumeric, pepper, and chilli. (T)	22	73.3	25	83.3	56	82.4	65	97.0
50.	Meatballs which are rubbery and not easily spoiled are meatballs containing some formaline. (T)	21	70.0	26	86.7	58	85.3	55	82.1

Appendix 2 The percentage of the cadres answering the nutritional knowledge items correctly

Nutritional Knowledge	Control				Intervention			
	Baseline		Endline		Baseline		Endline	
	n	%	n	%	n	%	n	%
BASIC NUTRITION								
1. Our daily foods can also be useful to improve the body stamina. (T)	4	100.0	4	100.0	14	100.0	14	100.0
2. Milk, fish, and tofu are sources of animal protein. (F)	0	0.0	2	50.0	2	14.3	5	35.7
3. The source of vitamin and mineral is rice. (F)	3	75.0	3	75.0	9	64.3	11	78.6
4. Obese children will not arouse malnutrition. (F)	1	25.0	1	25.0	8	57.1	9	64.3
5. Children who are thin and their face is wrinkled are children of poor nutrition which are called kwashiorkor. (F)	0	0.0	2	50.0	5	35.7	6	42.9
6. One kind of food belonging to protein sources is tofu. (T)	4	100.0	4	100.0	9	64.3	12	85.7
7. The drinking water need a day is four glasses. (F)	4	100.0	3	75.0	10	71.4	13	92.9
8. Frying oil is a source of fat, and so is avocado. (T)	3	75.0	3	75.0	13	92.9	11	78.6
9. Foods of a energy source is rice, of a building source is fish, and of a regulating source is cassava. (F)	0	0.0	2	50.0	2	14.3	5	35.7
10. Food containing much iron is rice. (F)	3	75.0	3	75.0	3	21.4	7	50.0

Appendix 2 The percentage of the cadres answering the nutritional knowledge items correctly (cont.)

Nutritional Knowledge		Control				Intervention			
		Baseline		Endline		Baseline		Endline	
		n	%	n	%	n	%	n	%
NUTRITION FOR CHILDREN UNDER FIVE									
11.	Breastmilk coming out at the first time is called colostrum. (T)	4	100.0	4	100.0	12	92.3	13	100.0
12.	Exclusive breastfeeding should be given to infants up to four months old. (F)	3	75.0	1	25.0	5	38.5	10	76.9
13.	Honey and water can be given to a newborn baby. (F)	3	75.0	3	75.0	6	46.2	11	84.6
14.	Complementary feeding is given to children > six months old. (T)	4	100.0	4	100.0	12	92.3	13	100.0
15.	Breastfeeding can create an affection between the mother and baby. (T)	4	100.0	4	100.0	13	100.0	13	100.0
16.	Introduction to the household food can be given when the child is nine months old. (F)	3	75.0	1	25.0	1	7.7	10	76.9
17.	Breastmilk is as good as formulated milk. (F)	3	75.0	4	100.0	9	69.2	11	84.6
18.	Provision of complementary feeding to the child who is less than 6 months old may cause obesity to the child. (T)	4	100.0	3	75.0	8	61.5	10	76.9
19.	Breastmilk is enough to be given to a child up to 1 year. (F)	4	100.0	3	75.0	9	69.2	11	84.6
20.	Breastmilk may cause an allergy. (F)	4	100.0	4	100.0	12	92.3	12	92.3

Appendix 2 The percentage of the cadres answering the nutritional knowledge items correctly (cont.)

Nutritional Knowledge	Control				Intervention			
	Baseline		Endline		Baseline		Endline	
	n	%	n	%	n	%	n	%
FOOD SELECTION FOR CHILDREN UNDER FIVE								
21. If a child does not want to eat, s/he may be forced or angered. (F)	4	100.0	4	100.0	6	50.0	10	83.3
22. Children should be persuaded to eat while watching TV. (F)	3	75.0	3	75.0	3	25.0	10	83.3
23. Children should be given a chance to select a menu. (T)	2	50.0	1	25.0	10	83.3	12	100.0
24. Snacks may be given to children between the time for breakfast and lunch. (T)	0	0.0	2	50.0	7	58.3	10	83.3
25. <i>Giké</i> -like foods are good to be given as snacks for children. (F)	4	100.0	4	100.0	9	75.0	12	100.0
26. Milk is a source of calcium which is good for the growth of child's skeleton. (T)	4	100.0	3	75.0	12	100.0	12	100.0
27. Sweet condensed milk is as good as formulated milk. (F)	2	50.0	4	100.0	7	58.3	9	75.0
28. Prior to preparing milk for her child, the mother does not need to wash hands since using a spoon. (F)	4	100.0	4	100.0	10	83.3	11	91.7
29. Breastmilk contains nutrients which are good for the growth of the child's brain. (T)	4	100.0	4	100.0	12	100.0	12	100.0
30. The characteristics of fresh fish are its gills are red, and its eyes are pale. (F)	1	25.0	1	25.0	7	58.3	9	75.0

Appendix 2 The percentage of the cadres answering the nutritional knowledge items correctly (cont.)

Nutritional Knowledge	Control				Intervention			
	Baseline		Endline		Baseline		Endline	
	n	%	n	%	n	%	n	%
BASIC SANITATION								
31. Each house must have its own toilet. (T)	4	100.0	4	100.0	14	100.0	13	92.9
32. The requirement of healthy water is its colour is clear, not turbid. (T)	4	100.0	4	100.0	14	100.0	14	100.0
33. Dysentery and suffering from intestinal worms among children occur due to defecating anywhere. (T)	4	100.0	2	50.0	12	85.7	13	92.9
34. Feces and waste water may be flowed to a fishpond. (F)	4	100.0	2	50.0	13	92.9	13	92.9
35. Plastic belongs to organic waste. (F)	3	75.0	2	50.0	12	85.7	11	78.6
36. Throwing rubbish into the river does not make any problem. (F)	4	100.0	4	100.0	13	92.9	13	92.9
37. A wound/ulcer may become a source of contamination coming from the body. (T)	4	100.0	4	100.0	14	100.0	14	100.0
38. Used paper belongs to organic waste. (T)	3	75.0	1	25.0	6	42.9	12	85.7
39. Tasting a food which is being cooked can use the pointing finger. (F)	4	100.0	4	100.0	11	78.6	13	92.9
40. Before spoonfeeding children under five, it is enough washing hands without soap. (F)	4	100.0	4	100.0	12	85.7	11	78.6

Appendix 2 The percentage of the cadres answering the nutritional knowledge items correctly (cont.)

Nutritional Knowledge		Control				Intervention			
		Baseline		Endline		Baseline		Endline	
		n	%	n	%	n	%	n	%
FOOD SAFETY									
41.	Foods should be cooked until they are well done, not half-cooked. (T)	1	25.0	1	25.0	10	76.9	13	100.0
42.	Meat which has been soft and rather smelly can still be consumed. (F)	4	100.0	4	100.0	13	100.0	12	92.3
43.	Essense is a synthetic food coloring which can be used in food. (T)	0	0.0	0	0.0	6	46.2	12	92.3
44.	Vegetables or fruits may directly be eaten without being washed first. (F)	4	100.0	4	100.0	12	92.3	11	84.6
45.	Used newspaper is not good for wrapping foods. (T)	4	100.0	1	25.0	11	84.6	9	69.2
46.	<i>Pijer</i> (a kind of food additives) can be used to make <i>ketupat</i> (boiled rice wrapped in coconut leaves) or <i>lontong</i> (boiled rice wrapped in a piece of banana leaf). (F)	3	75.0	2	50.0	10	76.9	11	84.6
47.	Rhodamin B (a textile dye) contains in many kinds of snacks for children. (T)	4	100.0	4	100.0	11	84.6	11	84.6
48.	Child snacks with bright colors can be consumed. (F)	4	100.0	4	100.0	11	84.6	12	92.3
49.	Food additives which can be consumed are tumeric, pepper, and chilli. (T)	3	75.0	4	100.0	11	84.6	13	100.0
50.	Meatballs which are rubbery and not easily spoiled are meatballs containing some formaline. (T)	4	100.0	4	100.0	12	92.3	12	92.3



Appendix 3 Posters for *Posyandu*



Appendix 4 Banners for *Posyandu*



Appendix 5 Home garden in villages



Appendix 6 Nutrition extension activities



Appendix 7 Reseachers, posyandu’s cadres, and research assistants