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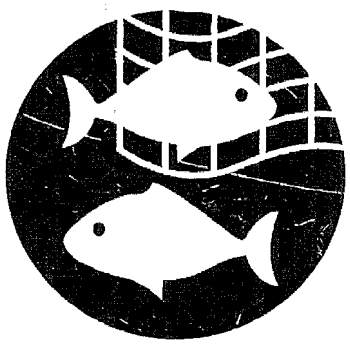
THE NUTRITIONAL STATUS OF PRE-SCHOOL CHILDREN, KAINJI LAKE COMMUITIES, NIGERIA

A FOLLOW-UP SURVEY

by F.A. Adu

A report submitted to:

Nigerian-German (GTZ)
Kainji Lake Fisheries
Promotion Project



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BCG	*Bacille Calmette Guerin*
BMI	Body Mass Index
DPT	Diphtheria Pertussis Tetanus
FAO	Food and Agriculture Organisation, United Nations
GTZ	*Deutsche Gesellschaft fuer Technische Zusammenarbeit mbH*
IEC	Information Education Communication
KLFPP	Kainji Lake Fisheries Promotion Project
LBW	Low Birth Weight
LG	Local Government
NCHS	National Centre for Health Statistics (United States of America)
NIFFR	National Institute for Freshwater Fisheries Research
ORS	Oral Rehydration Solution
PEM	Protein Energy Malnutrition
PHC	Primary Health Care
SD	Standard Deviation
UN	United Nations
UNICEF	United Nations Children's Emergency Fund
WHO	World Health Organisation

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Abstract

This survey was carried out to provide the Kainji Lake Fisheries Promotion Project (KLFPP), whose overall goal is the improvement of the standard of living of fishing communities around Kainji Lake with the fisheries of Kainji Lake managed on a sustainable basis, with follow-up data for long-term monitoring and evaluation of the overall project goal. A similar survey, conducted in 1996, provided the baseline against which data from the current survey was evaluated.

In a cross-sectional survey, anthropometric data was collected from 576 children aged 3 - 60 months in 282 fisherfolk households around the southern sector of Kainji Lake, Nigeria. In addition, data was collected on the nutritional status and fertility of the mothers, vaccination coverage of children and child survival indicators. For control purposes, 374 children and 181 mothers from non-fishing households around Kainji Lake were likewise covered by the survey.

A standardised questionnaire was used to collect relevant data, while anthropometric measurements were made using appropriate equipment. Data compilation and analysis was carried out with a specially designed Microsoft Access® application, using NCHS reference data for the analysis of anthropometric measurements. Statistical significance testing was done using EPI-INFO® software.

The results of the follow-up survey indicate a slight increase in the percentage of stunted pre-school children in fishing households around Kainji Lake, from 40% in 1996 to 41% in 1999. This increase is however not statistically significant (p= 0.704). Over the same period, the percentage of stunted children in non-fishing households increased from 37% to 39% (p= 0.540), which is also not statistically significant. Likewise, there were no statistically significant differences between the 1996 and 1999 results for the prevalence of either wasted or underweight children in fishing households. The same applies to children from non-fishing households. In addition, vaccination coverage remains very low while infant and child mortality rates continue to be extremely high with about 1 in 5 children dying before its fifth birthday.

There has been no perceptible and lasting improvement in the standard of living of fishing households over the course of the second project phase as indicated by the persistently high prevalence of stunting. The situation is the same for the control group, indicating that for the region as a whole, a number of factors beyond the immediate influence of the project continue to negatively impact on the standard of living. The results also show that the project activities have not had any negative long-term effect on the nutritional status of the beneficiaries.

1 Introduction

1.1 Kainji Lake Fisheries Promotion Project

The Kainji dam, constructed along the River Niger between 1964 and 1969, primarily for the purpose of hydro-electric power generation, resulted in the formation of the largest man-made lake in the country which is also one of the major sources of freshwater fish in Nigeria. Kainji lake has a surface area of 1,270 km^2 and approximately 250 rural communities of varying sizes located around it. Total population of these communities is approximated at 250,000 persons. More than half of the population belongs to the Hausa ethnic group, while other major ethnic groups are Lopawa, Gungawa and Nupe[1].

Together with the National Institute for Freshwater Fisheries Research (NIFFR) New Bussa, the Federal Department of Fisheries, and the State Fisheries Departments of Niger and Kebbi states, as the relevant authorities involved in various technical aspects of fishing and research activities on Kainji Lake, the German Ministry for Economic Co-operation, through its executing agency German Technical Aid (GTZ), initiated the Nigerian-German Kainji Lake Fisheries Promotion Project (KLFPP). The project, which commenced in 1993, has as its overall goal the improvement of the standard of living of fishing communities around Kainji Lake. In order to achieve this goal, the project aims at the sustained management of the fisheries of Kainji Lake. The project is currently at the end of its second phase which covered the period from December 1996 to November 1999.

1.2 Nutritional aspects of rural development

The nutritional status of children has been repeatedly recommended and internationally accepted as a reliable indicator of the standard of living of a population. The use of anthropometric indicators is based on the extensively observed phenomena that a growing child who lacks an adequate intake of food and is repeatedly ill does not have the body height corresponding to its genetic potential. Furthermore, inadequacies in the areas of food availability, basic education, income, delivery of health care services, housing and environmental conditions have proven to be underlying causes of inadequate food intake and repeated episodes of diseases. As a result, communities that are not able to satisfy their basic needs adequately generate higher proportions of individuals with inadequate anthropometric indices[2].

Indicators such as the level of income or of production alone, as are commonly used by various national and international institutions, do not suffice for making similar deductions, but improvements in these and in other sectors, as are being carried out by KLFPP can have impacts on the nutritional status, the level of which gives a more comprehensive and in depth picture of the overall standard of living. To this end, baseline data on the nutritional status of the target population has to be collected.

In addition, nutritional aspects should to be considered in the planning, implementation, monitoring and evaluation of rural development projects, particularly if the project in question is not directly aimed at an improvement of the nutritional situation, but may nevertheless have an impact on nutrition, as is the case with KLFPP. The project should be evaluated as to whether its impact on the nutritional situation is positive, neutral or negative.

1.3 Survey purpose and objectives

Purpose of the survey was to provide follow-up data for comparison to baseline data that was collected in October 1996, in order to facilitate long-term monitoring and evaluation of the overall project goal at the end of the second phase.

Besides the collection of data on the nutritional status of pre-school children and women in the project area, data on child survival, vaccination coverage and fertility was also collected.

1.4 Review of previous nutrition surveys

In October of 1996, a nutrition survey was conducted in the project area[3]. This cross-sectional survey provided the baseline data for the purpose of long-term monitoring and evaluation of the overall project goal. Data was collected from 768 children aged 3 - 60 months in 389 fisherfolk households around the southern sector of Kainji Lake, Nigeria. In addition, data was collected on the nutritional status and fertility of the mothers, vaccination coverage of children and child survival indicators. For control purposes, 576 children and 292 mothers from non-fishing households around Kainji Lake were likewise covered by the survey. Results of the baseline survey are presented in Section 3.

Other nutrition and health related surveys carried out at a local, regional and national level are described in the baseline survey report[3].

2 Methodology

2.1 Study design

Nutritional status of a representative cross-sectional sample of fisherfolk children between 3 and 60 months of age was determined through anthropometric measurements of weight and height as related to age, using appropriate equipment.

A standardised questionnaire, adapted from the baseline questionnaire, was used to collect information on occupation of head of household, fertility patterns, child survival, and vaccination status of children (see Annex 1).

Taking an expected malnourishment prevalence of approximately 40 % amongst children aged 3-60 months in the survey area, based on the baseline data, the number of children to be measured was calculated as follows [2]:

$$n = \frac{4 \times p \times (100-p)}{25}$$

n = number of children

p = expected prevalence

$$n = \frac{4 \times 40 \times (60)}{25} = 384$$

Tolerated sampling error and confidence level for this number of children lie at 5 % and 95 % respectively [4].

As cluster sampling was used, the calculated number of children to be measured was multiplied by a design factor of 1.5.

$$384 \times 1.5 = 576 \text{ children}$$

An average of 2 children below the age of five years was to be expected per household* around Kainji Lake[1,3]. Thus, total number of fisherfolk households to be sampled in the project area in order to cover the required number of children for anthropometric measurements was:

576/2 = 288 households (fishing)

The control group, as established in the baseline survey, consisted of children of non-fisherfolk** who lived in households within the project area. While not directly influenced by project activities, these households were assumed to have comparable demographic and socio-economic characteristics. This group was included in the survey to enable control for any external factors other than project activities which may have had an impact on the nutritional situation of the population as a whole, irrespective of occupation e.g. climatic conditions and which may either counteract or enhance project activities and effects.

For the control group, a design factor of 1.0 was used.

384 x 1.0 = 384 children

in

384/2 = 192 households (non-fishing)

Total number of children sampled was 576 + 384 = 960 children.

* a household is defined as all persons for whom meals are prepared using the same cooking facilities.
** non-fishing household defined as one whose main occupation is not fishing

2.2 Sample selection

Sample villages were selected at random from a listing of villages covered by the baseline survey. A total of 38 villages were selected, with 15 on the western shore and 23 on the eastern shore of the lake, reflective of the village density along the two shores.

In each village selected, an average of 25 children was sampled. A daily tally was taken to ensure that on the whole, about 60 % of children were selected from fishing households and about 40 % from non-fishing households, reflective of the proportion of each group in the total sample of children.

2.3 Questionnaire design

The questionnaire was adapted from the baseline survey questionnaire, which was written in English and translated into Hausa and back into English and carefully reviewed to eliminate any misinterpretations. The original exercise was jointly carried out by all enumerators involved in the data collection. At the time, a pre-test of the questionnaire was carried out for a total of 18 children and 10 mothers. The follow-up questionnaire contained fewer questions than the original, in line with the purpose and time frame of the follow-up survey.

2.4 Equipment and measurements

The following equipment was used for making the measurements:

- a Salters spring scale, 235-6S 25 kg Model, calibrated from 0 - 25 kg in 100 g subdivisions for the children's weight. The children were suspended in specially made cotton shorts.

- a standard bathroom scale, measuring up to 120 kg, calibrated in 1 kg subdivisions for the mothers weight.

- a height/length measuring board* with moveable headpiece, measuring up to 120 cm, calibrated in 1mm subdivisions, for measuring children's height/length.

- a measuring stick with moveable headpiece and attached measuring tape of up to 2m, calibrated in 1mm sub-divisions, for measuring mothers height.

As four sets of measuring apparatus were used, these were regularly calibrated individually and against each other to prevent errors due to incompatible settings.

2.5 Training of survey staff

The enumerators, most of whom had participated in the baseline survey, were (re)trained and supervised to ensure that correct procedures for sample selection were carried out, the questionnaire was administered properly, and measurements were made and recorded according to standard procedure.

2.6 Data collection and analysis

Data collection was carried out in two phases. The first phase covered villages on both shores with the four teams returning to New Bussa on a daily basis. The author accompanied the teams during the first 5 days of the survey to supervise data collection and ensure adherence to established procedures. The second phase was carried out from base camps located on the eastern and western shores by the four teams each consisting of one female enumerator and one male enumerator. Co-operation of mothers and the communities in general was very good, enhanced by the prior informative visits to the various (sub-) district heads. In most villages, only female enumerators were allowed to enter the compounds, in line with local culture and religion.

* made locally following intructions given in FAO manual [4]

Questionnaires were edited in the field by a specially trained enumerator/supervisor to enable correction of any errors before submission for data entry, which was done by 2 trained data entry personnel using a specially designed Microsoft Access® application.

Following data entry, a 100 percent computer edit was carried out to cross-check for incorrect data collection and erroneous data entry. Incorrectly collected and/or entered records were deleted*.

Data analysis was done using the same Microsoft Access® application. The anthropometric measurements were analysed using reference values of the NCHS reference population, which were incorporated in the database. The NCHS reference population has been adopted by WHO as the international anthropometric reference. The US children measured for this reference population are assumed to be well nourished, and the NCHS is an easily accessible well documented anthropometric database. Studies of socio-economically better-off children in developing countries, regardless of ethnic group, show anthropometric measurements, including height, similar to those of children from developed countries[5]. It is therefore reasonable to use the NCHS data as a reference population for analysing anthropometric data from developing countries. Furthermore, the use of a reference population does not imply that the population is a standard or goal which all other populations should attempt to attain but rather, a point of reference to which other populations can be compared [6,7]. The same reference values were used in the analysis of the baseline data. Significance testing was done using the EPI-INFO® programme (chi-square, p-significant >0.05).

* 45 records deleted.

2.7 Ethical considerations

Several issues were considered as specified below:

- informed consent was sought through communication with community representatives and on an individual level as applicable, with accompanying clarification on purpose and nature of the study and benefits intended to result from the study. Each (sub-) district head was visited some days prior to data collection, to ask for permission and assistance for carrying out the interviews.

- utmost care was taken not to transgress local values and norms as they apply to the sampled individuals and the communities as a whole. It was, for example, generally forbidden by religion for mothers to be visited by male enumerators. Such interviews were always carried out by or in the presence of female interviewers. In some instances, interviews could only take place in the presence of the head of the household.

- confidentiality of data was ensured through proper training of survey personnel and handling of collected information.

3 Results

A total of 463 households (282 fishing, 181 non-fishing) were visited and data was collected from 950 children (576 from fishing, 374 from non-fishing households). The gender and age group distribution of the children* is presented below.

Table 1: Gender and age group distribution of sample children, Kainji Lake area, 1996 and 1999.

		Gender				Age group (months)									
		male		female		3-11		12-23		24-35		36-47		48-60	
		(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
Fishing	1996	389	51	379	49	154	20	144	19	122	16	164	21	184	24
	1999	263	48	288	52	90	16	102	19	90	16	113	21	156	28
Non-fishing	1996	297	52	279	48	114	20	106	18	98	17	107	19	151	26
	1999	179	51	175	49	67	19	69	19	59	17	67	19	92	26

3.1 Nutritional status of children

This section presents the nutritional status of pre-school children, which reflects the nutritional situation of the communities as a whole. The indices and cut-off points for the estimation of nutritional status are as follows:

Weight for height, which reflects the level of nutritional wasting. A child with a value below - 2 s.d.** (i.e. below approximately. 82 % of the standard weight as defined by the weight of a child of the same length or height in the reference population) is considered to be wasted, while a child with a value below - 3 s.d. (approx. 73 %) is severely wasted. Wasting infers acute undernutrition and causes include current inadequate food intake, incorrect feeding practices, infection or a combination of these factors. It is sensitive to short-term factors such as seasonal food availability or disease prevalence.

* after deletion of unusable records.
** -2 s.d. = minus 2 standard deviations, a statistical cut-off point.

Height for age, which reflects the level of nutritional stunting. Stunting is indicated by low height for age as compared to the standard height of a child of the same age in the reference population. Children with a value below - 2 s.d. (i.e. below 92 % of the standard height for age) are considered to be stunted (severe stunting below - 3 s.d., approx. 88%). Stunting is an indicator of chronic undernutrition and is associated with a number of long term factors such as chronic insufficient protein energy intake, frequent infection, sustained incorrect feeding practices and low socio-economic family status.

Weight for age, which determines the level of undernourishment (underweight) and can be considered a combination of nutritional stunting and wasting. A value of below - 2 s.d. (i.e. below approximately 79 % of the standard weight for age) infers that the child is underweight, while a child below -3 s.d. (i.e. below approximately 69 %) is severely underweight. Weight for age data are used in the child health card for individual growth monitoring of children.

The presented figures and tables are discussed later in Section 4.

Figure 1: Proportion of malnourished children by main household occupation, Kainji Lake area, 1996 and 1999.

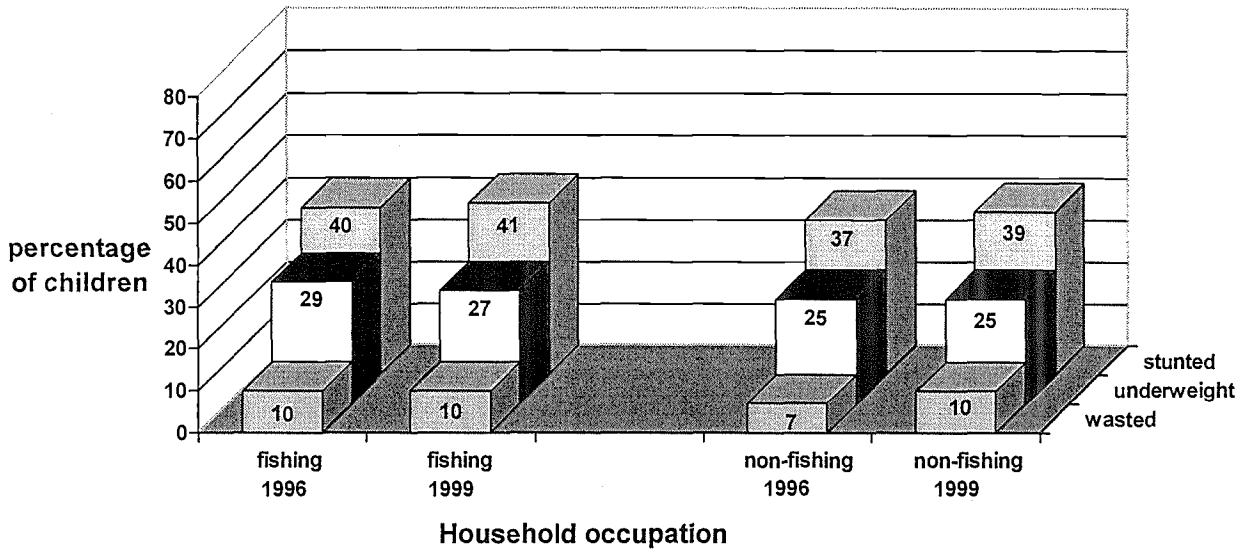


Figure 2: Weight for height curve of children, fishing households, Kainji Lake area, 1996 and 1999, in comparison to the NCHS standard.

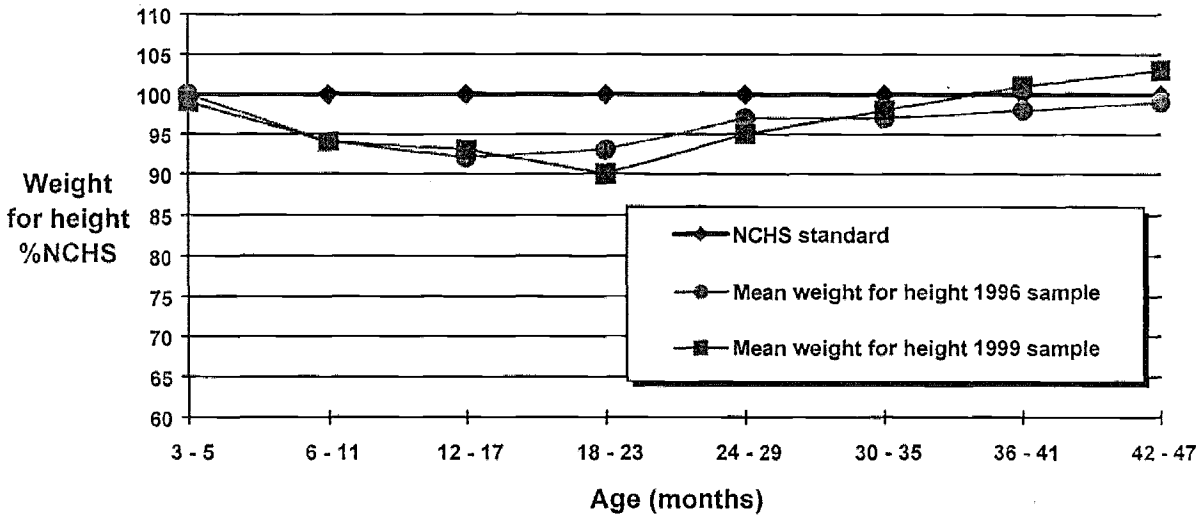


Figure 3: Weight for height curve of children, non-fishing households, Kainji Lake area, 1996 and 1999, in comparison to the NCHS standard.

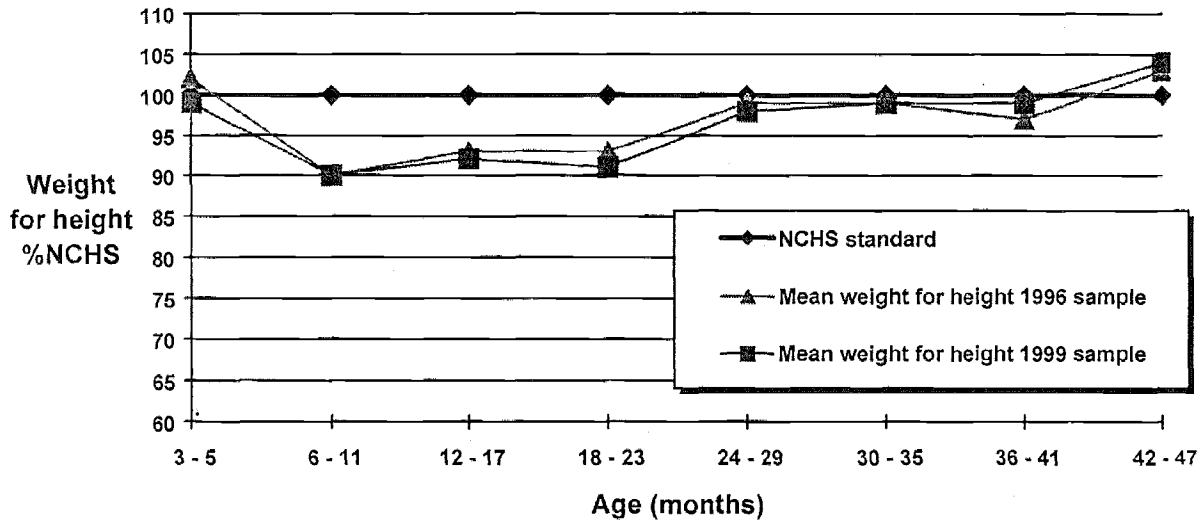


Figure 4: Height for age curve of children, fishing households, Kainji Lake area, 1996 and 1999, in comparison to the NCHS standard.

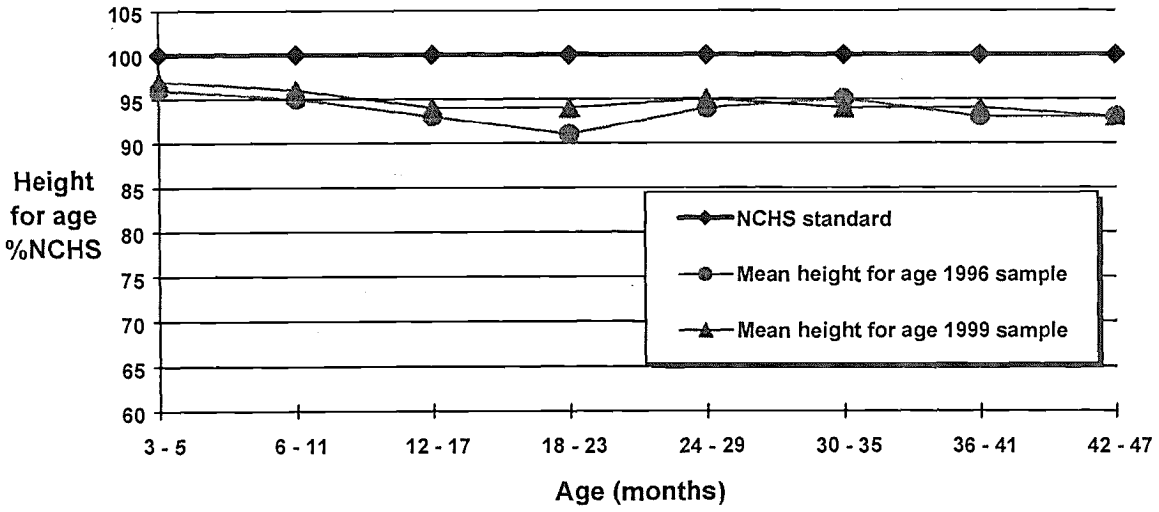


Figure 5: Height for age curve of children, non-fishing households, Kainji Lake area, 1996 and 1999, in comparison to the NCHS standard.

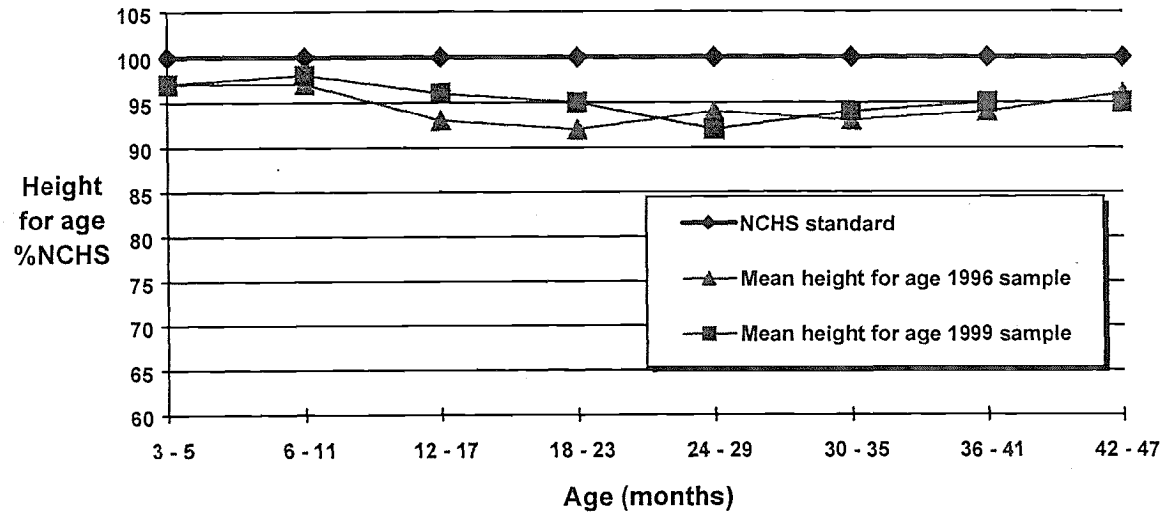


Figure 6: Weight for age curve of children, fishing households, Kainji Lake area, 1996 and 1999, in comparison to the NCHS standard.

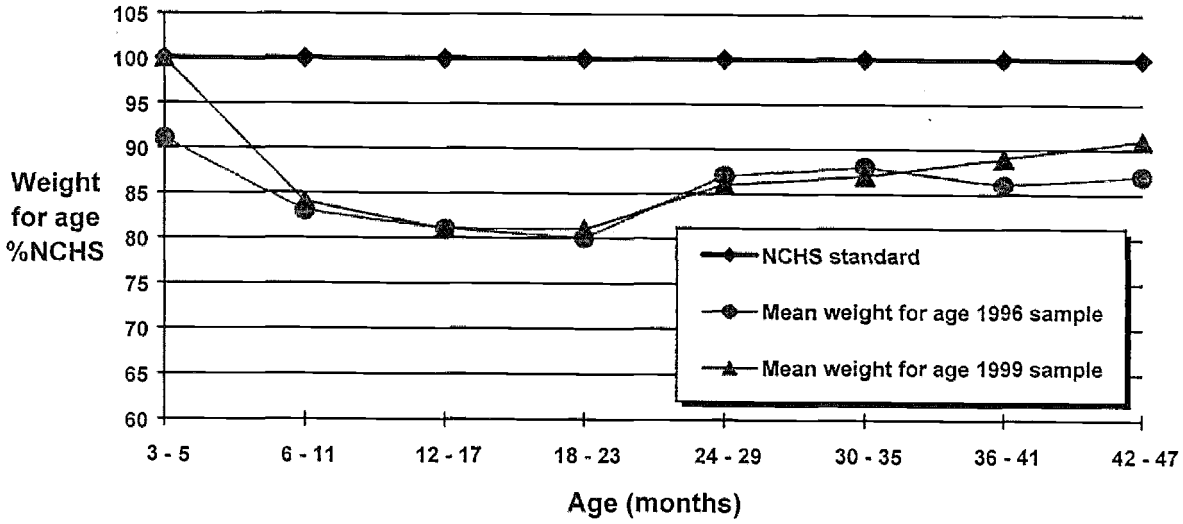
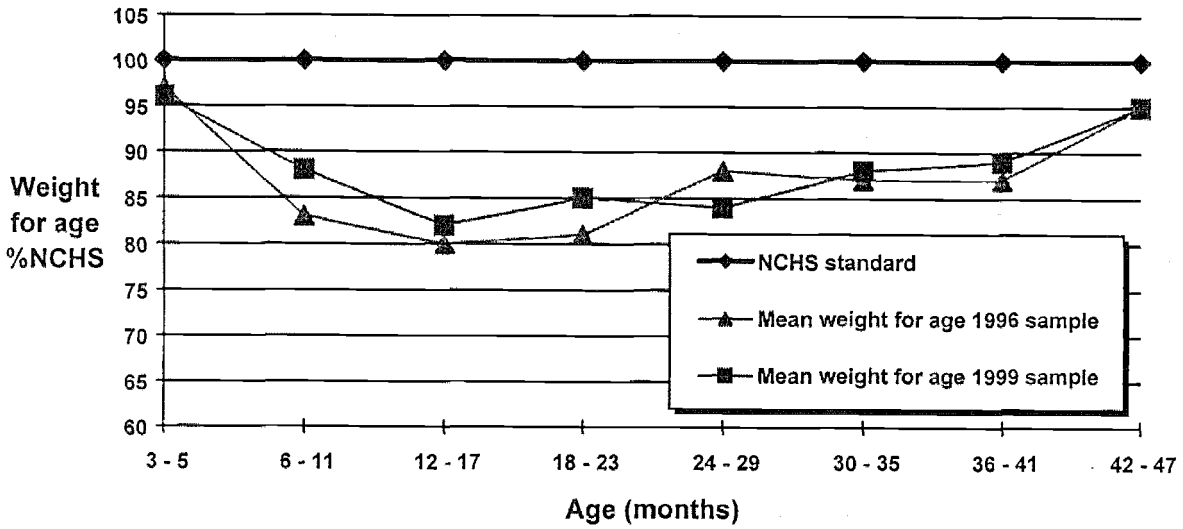


Figure 7: Weight for age curve of children, non-fishing households, Kainji Lake area, 1996 and 1999, in comparison to the NCHS standard



3.2 Nutritional status of women of child bearing age

The body mass index (BMI)* was used to asses the nutritional status of women of child bearing age. A BMI of less than 18.5 kg/m^2 infers undernourishment. Other anthropometric cut-off points frequently used for women are 145 cm for stunting (height) and 45 kg for wasting (weight), values below which a satisfactory pregnancy outcome may be at risk.

Table 2: Anthropometric data of women of child bearing age, Kainji Lake area, 1996 and 1999

		BMI < 18.5 kg/m^2 (n)	(%)	Height < 145 cm (n)	(%)	Weight < 45 kg (n)	(%)	Mean BMI	Mean Height	Mean Weight
Fishing	1996	40	10	3	1	26	7	21.3 ± 2.6	158.58 ± 6.08	53.63 ± 7.32
	1999	29	11	1	0	13	5	21.3 ± 2.5	159.40 ± 5.97	54.12 ± 7.15
Non-fishing	1996	34	12	0	0	15	5	21.5 ± 2.7	159.79 ± 5.90	54.91 ± 7.55
	1999	19	11	1	0	14	8	21.7 ± 2.8	159.59 ± 6.26	55.23 ± 8.17

3.3 Vaccination coverage of children

The child health card, which should usually be given to children seen in government health centres, is meant for recording information on the child's vaccination record as well as other important data such as the child's birth weight, growth rate and major periods of illness during the first five years of life. It also gives instructions to mother's on how to prepare an oral rehydration solution (ORS) to counteract the effects of diarrhoea in children.

Figures of the overall and age-group specific percentage of children fully vaccinated** could not be calculated for the sample, as too few children possessed a record of vaccination i.e. child health chart (Tab. 3) to allow for relevant statistical analysis.

* BMI = Weight (kg)/[Height (m)]^2

** to be considered as fully vaccinated, a child should have received the following vaccinations by 12 months of age: BCG, measles and three doses each of DPT and polio.

Table 3: Distribution of children by availability of child health card, Kainji Lake area, 1996 and 1999.

		Health card available					
		yes		no		lost	
		(n)	(%)	(n)	(%)	(n)	(%)
Fishing	1996	23	3	738	96	7	1
	1999	10	2	521	94	20	4
Non-fishing	1996	31	5	536	93	9	2
	1999	10	3	335	94	9	3

The BCG vaccination, which leaves an easily recognisable scar on the upper arm, was used as proxy indicator of vaccination coverage. Comparative 1996 data for Borgu L.G. showed 64 % of all pre-school children as having the BCG scar, and 15 % of children being fully immunised.

Table 4: Distribution of children by presence of BCG scar, Kainji Lake area, 1996 and 1999.

		BCG scar present			
		yes		No	
		(n)	(%)	(n)	(%)
Fishing	1996	146	19	622	81
	1999	120	22	431	78
Non-fishing	1996	109	19	467	81
	1999	94	27	260	73

3.4 Fertility and infant/child mortality indicators

Almost all deliveries by interviewed mothers took place at home (98 % for fishing and 96 % non-fishing households); with only about 3 % of deliveries carried out in government health centres. Reliable official records of infant/child* deaths were not readily available. Consequently, calculation of the birth and infant/child mortality rates by conventional methods was not possible. As such, the figures presented below serve as proxy indicators of fertility and child mortality.

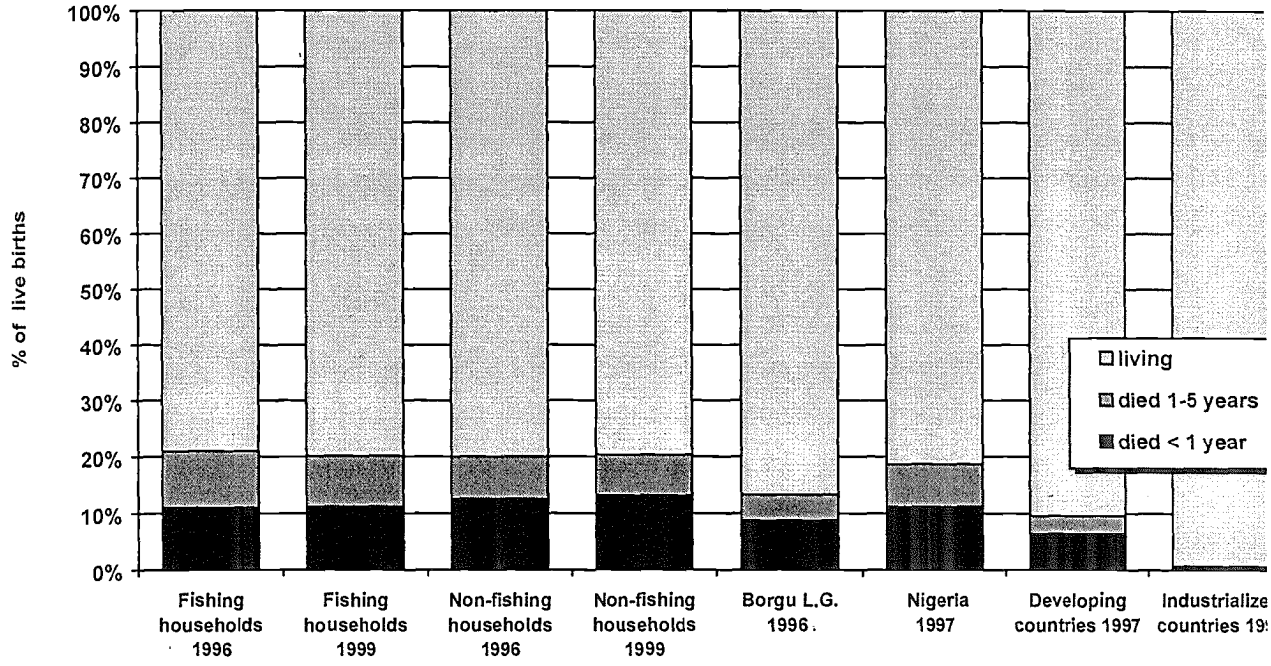
* Infant defined as under one year of age; child defined as under five years of age.

Table 5: Fertility indicators of women of child bearing age, Kainji Lake area, 1996 and 1999.

		Number of children delivered[a]		
		Average	min.	max.
Fishing	1996	4.7 ± 2.7	1	16
	1999	4.9 ± 2.6	2	15
Non-fishing	1996	5.1 ± 2.8	1	15
	1999	4.9 ± 2.4	2	13

[a] n = 266 mothers (fishing), 171 mothers (non-fishing) who gave relevant information

Figure 8: Infant/child mortality indicators, Kainji Lake area, 1996 and 1999, in comparison with local, national and regional data.



Source: Borgu L.G.[5], Nigeria[8], Developing countries[8], Industrialized countries[8].

4 Discussion and conclusions

In line with the survey purpose of monitoring and evaluation of the overall project goal at the end of the second project phase, the main focus of the following discussion is the comparison of the 1999 nutritional status, as defined by the prevalence of stunting, wasting and underweight amongst pre-school children, to the baseline nutritional status of the same population in 1996. In addition, proxy indicators of fertility and infant mortality from the two surveys are also compared and evaluated.

As was the case in 1996, precise records of age were not available for most children in 1999. Similar studies[3] suggest a tendency to slight age overreporting. Taking this fact into account, the results of the follow-up survey indicate a slight increase in the percentage of stunted pre-school children in fishing households around Kainji Lake, from 40% in 1996 to 41% in 1999. This increase is however not statistically significant ($p= 0.704$). In other words, going by established statistical testing procedures which take into account the sample size as well as the baseline and follow-up prevalence, no significant change has occurred in the prevalence of stunted pre-school children in fishing households. Over the same period, the percentage of stunted children in non-fishing households increased from 37% to 39% ($p= 0.540$), which is also not statistically significant.

At 10%, the prevalence of wasted children in fishing households in 1999 was the same as in 1996 ($p= 0.892$, not statistically significant). For non-fishing households, the prevalence of wasted children increased from 7% in 1996 to 10% in 1999 ($p=0.081$). While this value is also not statistically significant, it comes relatively close to being significant. Such an increase would be unexpected, given that the survey was carried out during the harvest season, when food shortage in the area tends to be minimal[1].

No statistically significant difference was observed for the prevalence of underweight children in fishing households ($p=0.471$) with 29% and 27% for 1999 and 1996 respectively. The prevalence of underweight children in non-fishing households was the same, at 25%, in 1999 and 1996 ($p=0.962$, not statistically significant).

Table 6: Prevalence of malnourished children, Kainji Lake area, 1996 and 1999

	% children			
	Fishing Households		Non-fishing Households	
	1996	1999	1996	1999
Wasted (- 2 s.d.)	10	10	7	10
(- 3 s.d.)	6	3	2	2
Stunted (- 2 s.d.)	40	41	37	39
(- 3 s.d.)	14	16	11	15
Underweight(- 2 s.d.)	29	27	25	25
(- 3 s.d.)	11	9	7	9

Plots of mean weight for height as a percentage of the NCHS standard, as shown in Figure 2, also show age-group specific similarities between the baseline and follow-up data. The trend line is almost identical for the 1996 and the 1999 sample of children from fishing households. At age 3-5 months, the mean weight for height is still at about 100% of the standard, after which it continuously falls across subsequent age groups to about 90% at age 18-23 months. Starting with the age group 24-29 months, the trend is reversed as mean weight for height increases steadily towards the 100% line with increasing age. Approximately the same trend is reflected in Figure 3 for children from non-fishing households.

Likewise, Figures 4, 5, 6, and 7 show the similarities between the 1996 and 1999 samples for the other 2 indices of nutritional status.

The conclusions to be drawn from these findings with respect to the overall project goal of improving the standard of living of fishing communities around Kainji Lake are as follows:

There has been no perceptible and lasting improvement in the standard of living of fishing households over the course of the second project phase as indicated by the persistently high prevalence of stunting. The situation is the same for the control group i.e. fishing households, indicating that for the region as a whole, a number of factors beyond the immediate influence of the project continue to negatively impact on the standard of living. This is further evidenced by the continuously high under-5 and infant mortality rates, similar to those in 1996.

The results also show that the project activities have not had any negative long-term effect on the nutritional status of the beneficiaries.

5 Recommendations

Both the baseline and the follow-up survey were carried out primarily to obtain data for long-term monitoring and evaluation of the overall project goal. Consequently, the assessment, rather than a causal analysis of the nutritional situation was the main focus of the surveys. Further, it is acknowledged that the KLFPP is not a self-standing nutrition project directly targeted at an improvement of the nutritional and health situation of the Kainji Lake communities.

However, the results of both surveys indicate a continuing high prevalence of chronic and acute malnutrition, most likely resulting from a number of factors including incorrect weaning practices and high fertility rates. Low immunization coverage and limited or no access to adequate health services continue to contribute to unacceptably high infant and under-5 mortality rates. As such, based on the ethical obligation to maximize potential benefits of the surveys beyond sole use of the data for project monitoring purposes, the following recommendations, as previously stated in 1996, are emphasized. These recommendations should be communicated to the appropriate health authorities and be applied for public health measures to improve community health:

- Promotion of nutrition and health information through appropriate IEC activities, in health centres, women's and men's groups and schools. Particular focus should be given to the following aspects:
  - Nutrition during pregnancy and lactation
  - Colostrum feeding
  - Weaning practices including timely introduction of weaning foods and composition of weaning foods.
  - Prevention of kwashiorkor, advantages of frequent fruit consumption, ORS

- Development and propagation of appropriate weaning food mixes, using the locally available and affordable ingredients and additives. Additives to be given particular attention are fishmeal, groundnutpaste and oil.

- Promotion of growth monitoring through:
  - Distribution of sufficient quantities of child health charts at health centre level and at household level.
  - Education of mothers on the correct interpretation of the growth chart and its relevance.
  - Regular growth monitoring sessions, both static and mobile.

- Improvement of vaccination coverage through:
  - Procurement and distribution of adequate quantities and quality of vaccines to health centres
  - Adequate monitoring and evaluation of vaccination activities

- Promotion of reproductive health information with special focus on:
  - Problems and risks of early childbearing and motherhood
  - Advantages of family planning

- Support of operational research at community level into the following areas:
  - Causes of household food insecurity and appropriate intervention measures
  - Follow-up nutrition survey in 3 to 5 years

6 References

1. Dreschl S, Alamu S, Adu F. Nutrition habits and food consumption pattern of fishing communities around Kainji Lake, Nigeria. A report prepared for the Nigerian-German Kainji Lake Fisheries Promotion Project, New Bussa 1995

2. Gross R, Kielmann A, Korte R, Schoeneberger H, Schultink W. Guidelines for nutrition baseline surveys in communities, Jarkata 1996

3. Adu F. The nutritional status of pre-school children, Kainji Lake communities, Nigeria. A baseline survey. A report submitted to the Nigerian-German Kainji Lake Fisheries Promotion Project, New Bussa 1996

4. FAO. Conducting small-scale nutrition surveys: A field manual, Nutrition in Agriculture No. 5, : 163-64, 1990

5. Martorell R, Mendoza F, Castillo R. Poverty and stature in children; in Linear growth retardation in less developed countries. Nestle Nutrition Workshop Series, Vol. 14. New York 1988

6. Beaton G. Small but healthy? Are we asking the right question?; in Human Organisation, Vol. 48, No. 1 : 30-39, 1989

7. Martorell R. Body size, adaptation and function; in Human Organisation, Vol. 48, No.1, : 15-20. 1989

8. United Nations Children's Fund (UNICEF). The State of the World's Children 1999.

Annex 1 Questionnaires

Kainji Lake Fisheries Promotion Project

Follow-up Nutrition Survey,

CHILDRENS (3 - 60 months) QUESTIONNAIRE

1. Child number (refer to mothers number) ___ ___ ___/ __

2. What is the gender of the child

1) male 2) female ___

3. How old is this child (months) *(record as stated by mother)*

FOR DATA ENTRY: ENTER THIS FIGURE ONLY IF CALCULATION (see 5.) IS NOT AVAILABLE

4. *Observation*: Date of birth, if known ___ ___/___ ___/___ ___

5. *Calculation:* Age of child (months) ___ ___

6. *Observation:* 1) Date of birth known
2) Date of birth not known ___

7. Does the child have a Child Health Card

1) yes 2) no 3) lost ___

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8. Have all the required immunisations been carried out (see Child Health Card)

Type of vaccine	Age to be given	carried out
BCG	at birth	
Oral polio	6 weeks	
	10 weeks	
	14 weeks	
DPT	6 weeks	
	10 weeks	
	14 weeks	
Measles	9 months	

1) yes
2) no

9. Observation: BCG Scar: 1) Yes 2) No __

10. Weight of the child (kg) __ __.__

11. Height of the child (cm) __ __ __.__

Kainji Lake Fisheries Promotion Project

Follow-up Nutrition Survey,

MOTHERS QUESTIONNAIRE

Time start:.....

1. Village number ___ ___

2. Mother number ___ ___ ___

3. Enumerator Number ___ ___

4. Date of Survey ___ ___/___ ___/___ ___

5. What is the main occupation of the head of the household

1) fishing 2) non-fishing ___

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6. How many babies have you delivered to date. ___ ___

7. Liveborn ___ ___

8. now living ___ ___

9. now dead ___ ___

10. of dead, < 1 year ___ ___
11. 1-5 years ___ ___
12. > 5 years ___ ___

13. Stillborn ___ ___

X) no answer

14. How many of your children were born at:

Home ___ ___
Government Health Centre ___ ___
Private Health Centre ___ ___
Mission ___ ___
Other ___ ___

15. Weight of the mother (kg) ___ ___ ___

16. Height of the mother (cm) ___ ___ ___

Annex 2 List of sample villages

	Western Shore
1.	Bakin Dam 1
2.	Kwata Wara
3.	Tunga Wadata
4.	Tunga Aliyu
5.	Malale
6.	Tunga Sule
7.	Kwanga
8.	Maira Kumi
9.	Gwanda
10.	Sabon Yuma
11.	Tunga Sani
12.	Maman Maisage
13.	Amboshidi II
14.	Tunga Leda
15.	Kuku Bawa
	Alternatives
1.	Tunga Ango
2.	Yantala
3.	Doga Mashaya

	Eastern Shore
1.	Sake Jijinka
2.	Angulu
3.	Bai Allah
4.	Tunga Gunguwa
5.	Tunga Giwan
6.	Tunga Danladi Biri
7.	Garafini
8.	Tunga Maiuloko Uba
9.	Tunga Rini
10.	Machin Kayi
11.	Wuchi
12.	Kade
13.	Garba Yunawa
14.	KukaUku
15.	Halidu
16.	Warra
17.	Raishe Sarkawa
18.	Wawu Jaji
19.	Wawu
20.	Masamali
21.	Bakin Ruwa
22.	Gushin Dusi
23.	Bakari
	Alternatives
1.	Kajabu
2.	Malofo
3.	Tunga Liman

Annex 3 Survey Timetable

Activity	Duration	Week 1	2	3	4
(Re-)Training of survey staff	1 day -				
Data collection	21 days	---	-----	-----	
Supervision of data collection	21 days	---	-----	-----	
(Re-) Training of data entry assistants	½ day -				
Data compilation/ entry	14days	-----	-----		
Data analysis	7 days				-----
Report writing	7 days				-----
Presentation of survey results	½ day				