



# FINAL REPORT

**Program Title:** *Improving food security for IDPs and vulnerable populations of Bardé Canton*

**Agreement No:** *AID-OFDA-G-11-00111-00*

**Program Goal:** *To restore food security and address malnutrition in the Bardé Canton, Assoungba.*

**Start/End Dates:** *01/June/2011 – 30/Apr/2012*

Total Number of Individuals Affected in the Target Area	<u>21,000</u>
Total Number of Beneficiaries Targeted (Individuals)	<u>7,800</u>
Total Number of IDP Beneficiaries Targeted (Individuals) as subset of above	<u>3,900</u>



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# 1. CONTEXT EVOLUTION

## 1.1 IDP'S SITUATION IN THE BARDE CANTON

Since 2007, return of IDPs to their area of origin were noticed but some of them were rather due to agricultural activities in rainy season and weren't permanent. According to OCHA, 20,676 IDPs have reached their area of origin between 2008 and 2012 in the whole Assoungba department.

In January 2011, 2,140 IDP's households were registered by Première Urgence – Aide Médicale Internationale (PU-AMI) in the Arkoum – Goundiang – Allacha area (*see map in annex 1*).

IDPs site or village	nber of HH	IDPs site or village	nber of HH
Alacha	352	GozLoubane	25
Arkoum II	1,200	Habilé	45
FerrickAgouné	76	HilléDehié	157
Fortougoudji	44	Matourouda	16
Goundiang	171	Mourouské	54
<b>TOTAL</b>			<b>2,140</b>

Table1: Number of IDPs households in main displacements sites in Barde  
Sources PU-AMI

In a region naturally scarce of natural resource, those population concentrations resulted in tensions between host and displaced populations. Indeed, competition on access to water, firewood, land... increased the difficulties of local inhabitants and didn't allow IDPs to make their living, especially due to the lack of cultivable land.

In 2010, the Agreement between Chad and Sudan establishing the "Force mixte" to patrol the porous border and by precluding the respective support to each other's rebel groups constituted a major progress on the way of security restoration, as the main reason that motivated IDPs to stay in the displacement sites was the bad perception of security in their area of origin.

In 2011, a governmental speech informed that there wouldn't be any more IDPs at the end of the year: they either returned to their area of origin or integrated their new village.

This message was relayed by local authorities and UN Agencies. UNHCR, following the governmental policy, organized assistance to returnees wishing to reach the Kado canton to settle. Between May 2011 and January 2012, the return of 7,207 persons to Kado canton was facilitated. The majority of them settled in returnees' sites (Borota, Hilleket, Nakoulouta...). The population of these returnees' sites is not known for the moment, as these sites are currently monitored by UNHCR. In June 2012, about 1,500 IDPs were still waiting to be transported to the return sites, and 8,287 persons chose to integrate the local population<sup>1</sup>.

This massive return movement had a major impact on the activities planned in this project: indeed, most of the targeted beneficiaries left our intervention area (Barde canton) during the year. In order to respect the objectives of this project and cover the returnees' needs, PU-AMI chose to implement its activities in both Barde and Kado canton, with a focus on returnees' sites.

## 1.2 SECURITY

Security hasn't changed during the year 2011 and the beginning of 2012. Rebel attacks haven't been noticed thanks to the presence of Chadian/Sudanese "Force Mixte" in Kado canton. Therefore, porosity remains along the frontier, which causes small banditry across the border. Vehicles have been stolen from some UN agencies and NGOs, but most of them were intercepted by military' authorities before crossing border. Generally, attacks target vehicles and no victims had been deplored.

Tensions observed in 2011 are mostly due to antagonism between farmers and breeders. Indeed, the massive movements of population and the past armed conflicts have reduced the capacity of traditional conflicts mediation systems. At the end of 2011, several cases of violence between breeders and farmers have been noticed; those that couldn't be handled by traditional authorities were referred to Assounga's Prefect, in Adre.

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<sup>1</sup>Source : OCHA – June 2012

### 1.3 AGRICULTURE

2011 was characterized by a late start of rainy season, an early end and reduced precipitations during rainstorms. On top of it, in some areas, there was an absence of rain during several weeks during the season, up to 18 consecutive days. As a consequence, people who sowed after the first rain lost all their fields and had to get new crops seeds to sow again, reducing the plants' growth period.

Moreover it is generally accepted that 12 significant rainstorms are necessary to induce a sufficient millet growth. During this rainy season, only 6 main rainstorms could be observed, which can partly explain the low growth rate of the plant at the harvest period.

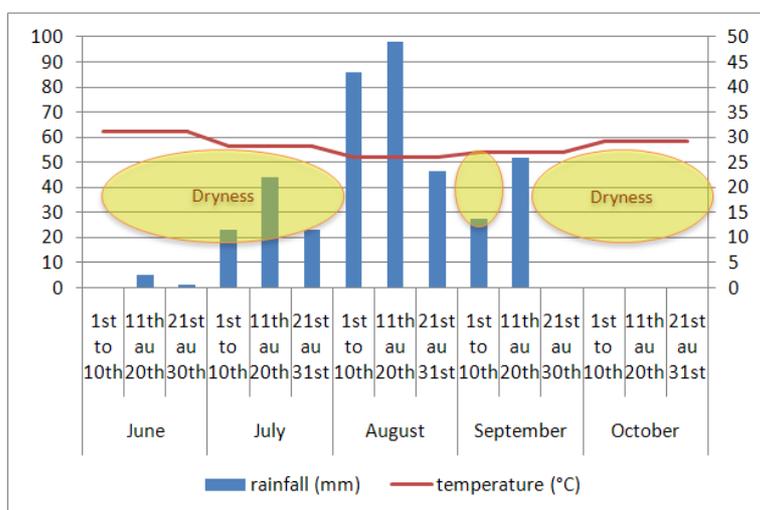


Figure 1: Graph of 2011 rainfall and medium Chadian temperature to enlighten dryness during rainy season

Several cases of pest attacks, especially locusts, were also noticed. Indeed, post harvest monitoring shows that 25% to 30% of cultivated areas were concerned. The combined effect of drought and pest resulted in only 30% to 35% harvested surface. More details are given in the post-harvest survey part.

### 1.4 FOOD SECURITY

The low yield harvested in 2009 had major impact on population poverty. Even if the good conditions of 2010 cultural season allowed improving crop production, the majority of poor households didn't restore the possession they had to overcome the long lean period of

2010. The shock of 2011 drought made this situation worst, increasing vulnerability of both IDPs and poor host households.

In January 2012, a food security survey was made by PU-AMI in partnership with ECHO in 37 villages of Kado canton and on the area's main markets (as 89% of the population gets a part of their food from the market). Even if this survey wasn't specifically targeting the intervention area of the project, we can consider that the results remain valid for the returnees of Kado canton and vulnerable population of Barde canton.

The survey aimed at evaluating the food security situation of the interviewed households by recording several data including their FCS<sup>2</sup> and CSI<sup>3</sup>. The results allowed the definition of a typology of the households of the canton, based on their vulnerability level. The FCS recorded shows that 65% of the households of the canton were in a worrying or weak food consumption state in January 2012.

FCS	Nutritional situation	% of households
< 28	Poor food consumption	22%
28 < FCS < 42	Average food consumption	43%
42 < FCS < 56	Acceptable food consumption	24%
> 56	Good food consumption	11%

Table 2 - Food Consumption Score measured in Kado canton in January 2012 by PU-AMI

This is particularly acute, considering that the survey was made during the most favorable period of the year in terms of food availability. The CSI indicator shows that 7% of the interviewed population uses destructive coping strategies, like diet or sale of goods. 79% of the population hadn't used this kind of strategies in January 2012.

The average income generated weekly by the households is below 10,000 FCFA (about 20\$). As the average household is composed of 6 persons, this income is equivalent to 570 FCFA (1.14\$) per person per day, which is lower than the poverty threshold defined by the World Bank (i.e. 2\$/person/day). Moreover a large part of the population (42%) earns less than 4,000FCFA (about 8\$) per week (around 0.2\$/person/day); among them

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<sup>2</sup> Food Consumption Score

<sup>3</sup>CopingStrategy Index

8% only have about 1,500FCFA (about 3\$) each week (less than 0.1\$/person/day). These last ones can only survive thanks to community or international donation.

## 1.5 NUTRITION

The project's initial assessment of nutritional situation was established on the basis of a SMART nutritional survey conducted by WFP in Assoungaha in December 2010 and another led by ACF in November 2008 on the IDP's sites in Barde canton. These two surveys showed increasing rates of Moderate and Severe Acute Malnutrition between these two periods. It seemed to be the consequence of the low harvests after the poor rainfall of 2009.

In February 2012, PU-AMI, in collaboration with WFP and the Chadian Ministry of Health, led another SMART survey in both Barde and Kado cantons. The compared results of these three surveys are showed below:

	Oct/Nov 2008 <sup>4</sup>	Oct/Dec 2010 <sup>5</sup>	February 2012 <sup>6</sup>	
			Barde	Kado
Global Acute Malnutrition (Z-score)	7.6%	19.7%	16,6%	19.8%
Moderate Acute Malnutrition (Z-score)	6.3%	14.3%	13%	17,3%
Severe Acute Malnutrition (Z-score)	1.3%	5.5%	3,6%	2.6%
Mortality rate of children under five <sub>/10000</sub>	0.4	2.6	2,45	1,57

Table 3- Evolution of malnutrition rates recorded in the intervention area since 2008.

According to these data, it seems the GAM rate in the intervention area is caused by both structural and conjunctural factors. In one hand, it reveals the shock caused by the 2009 drought. But in the other hand, the GAM rate recorded in February 2012 (before the lean period) indicates that people haven't been able to restore their nutritional status even after 2010's good yields.

<sup>4</sup> Action contre la faim, *Enquête nutritionnelle anthropométrique et de mortalité rétrospective, Sites de déplacés tchadiens et populations hôtes d'Arkoum et Goundiang*, Octobre-Novembre 2008. This study includes 73% of IDPs and 27% of residents.

<sup>5</sup> IDP's *Nutritional Survey in Eastern Chad Preliminary Report* – WFP – Chadian Government – published in February 2011. This study includes IDPs only. The survey has been realized from October to December 2010.

<sup>6</sup> Nutritional survey in Barde and Kado canton – PU-AMI – February 2012

## 1.6 WATER ACCESS

According to national WASH cluster, Assounga is one of the poorest departments in terms of access to drinkable water, as about 80,000 children and 200,000 women have no access to a water plant. There are 38 drillings in our intervention area (28 in South Barde canton and 10 made by PU-AMI in 2011 in Kado canton).

A survey conducted by PU-AMI in both Barde and Kado cantons showed that only 25% of the interviewed households have access to a drilling. 75% of them get their water from traditional wells in wadis (seasonal river), and consume exclusively water from surface slicks.

This lack of access to drinkable water also has an impact on food security, favoring malnutrition.

# 2. PROGRAM ACHIEVEMENT

## 2.1 Sector 1: Nutrition

<b>Objective:</b>	To improve nutrition awareness and good practices	
Number of Beneficiaries Targeted	12,000 beneficiaries – 2,000 Households	
Number of IDP Beneficiaries Targeted	3,900 beneficiaries – 650 Households	
<b>Achievement :</b>	13,518 beneficiaries - 2,253 households	
Sub-sector Name:	Nutrition Education and Behavioral Change	
<b>Indicator 1:</b>	<b>Number of beneficiaries receiving nutrition education:</b>	
Target	1,000 households	
Achievement	2,077 households (12 000 beneficiaries)	
<b>Indicator 2:</b>	<b>Percent change in practice and/or knowledge pertaining to nutrition education topics :</b>	
Target	60%	
Achievement	60.5% change measured between initial and final KAP surveys.	
<b>Indicator 3:</b>	<b>Number of providers (health care and/or community volunteers) trained in provision of nutrition education</b>	
Target	15	
Achievement	176 community volunteers in 125 villages	

## 2.1.1 Sub-sector 1: Initial and Final nutritional and KAP survey

### 2.1.1.1 Focus groups :

In July 2011, 28 focus groups were conducted in 14 Barde canton villages. In each village 2 separate groups have been formed, one exclusively composed of women and the other composed of men. These groups aimed at giving a first idea of the nutritional and hygiene practices in the households, and the difference between men and women's perception of what an adequate behavior is.

The main information gathered through this activity is that very few people use soap to wash their hands before eating, cooking or after defecation. Drinkable water is scarcely available in the area, and there is no water treatment practiced in the households. Men are generally favored for the access of meat, and young children (less than 2 years old) are often weaned before they reach 24 months old, mostly because of their mother's new pregnancy. Lack of food diversity was also observed.

Villages	Number of men	Number of women	Total
Alacha	16	28	44
Arara	17	39	56
Arkoum	21	29	50
Bardé	15	32	47
Gorné	12	48	60
GozBagar	15	29	44
Matourouda	20	24	44
Total	116	229	345

Table 4: Focus groups participants

### 2.1.1.2 Initial KAP survey

An initial KAP survey was conducted in both Barde and Kado cantons, in order to complete the data collected through the focus groups. The questionnaires were elaborated on the basis of the discussions made with the groups. The data collected was relative to:

- Water access and treatment ;
- Hygiene practices ;
- Nutritional practices, especially for women and children younger than 5 ;
- Breastfeeding practices ;
- Child health and care practices ;

- Pregnant and lactating women care practices.

In total, 445 households were interviewed in 87 villages (73.8%), displacement sites (8.4%) and returnees' camps (17.8%). The repartition of the interviewed people is summarized below:

Area concerned	Total nb of villages	Total nb of Households	Households interviewed
Barde canton	42	6258	228
Kado canton	45	5664	217

Table 5: Repartition of the initial Kap survey interviewed households

#### A. WATER ACCESS AND TREATMENT

The figure below shows the proportion of interviewed households using water from different sources:

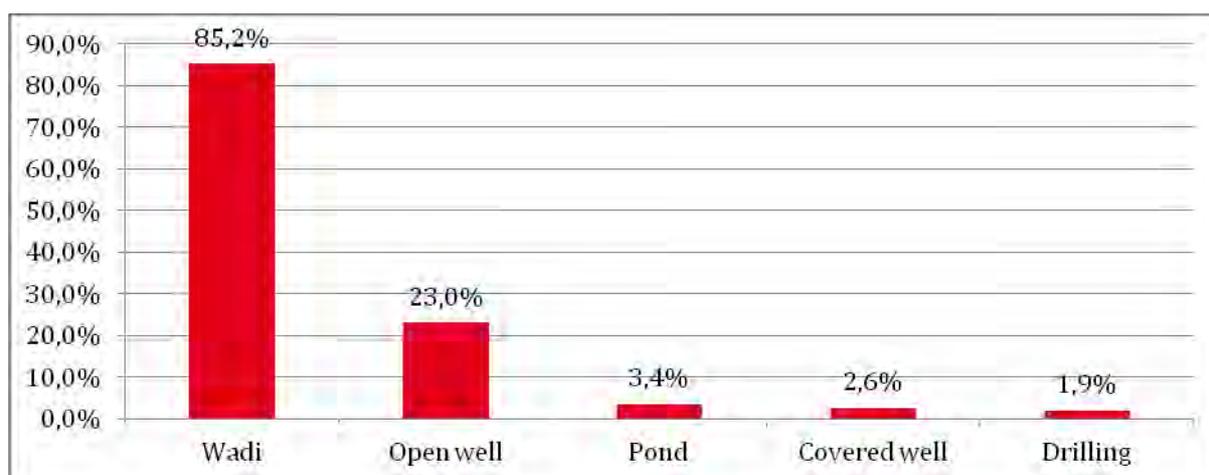


Figure 2- Proportion of persons collecting water from different sources.

We can see that 82.5% of the interviewed people collect water from wadis and only 1.9% from a drilling. This is clearly a problem impacting the health of the local population, and contributing to the prevalence of Global Acute Malnutrition.

78.2% of the interviewed people think that low quality water can lead to diseases. However, 95.9% of them said they don't treat the water they drink. Among the 17 people who treat it, 7 filtrate it with a scarf, 3 use a water filter, 3 boil it, 2 chlorate it and 2 use a traditional treatment, such as decantation with Neem seeds (*Azadirachta indica*).

65% of the people who don't treat the water said the cause is lack of money and means of treatment. 10.5% mentioned lack of time, and 15.1% judge that the water is clean enough and that treatment is not necessary.

### B. HYGIENE PRACTICES

78.1% of the interviewed persons had soap in their house. The usual use for the soap is presented in the next figure:

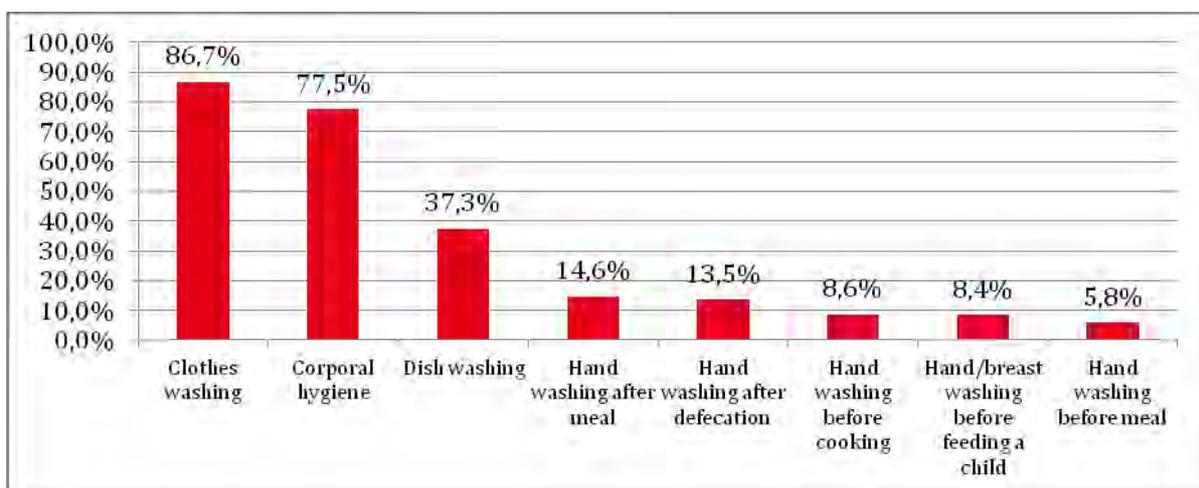


Figure 3- Soap use in the interviewed households.

We can see that soap is barely used for hand washing in the area. Combined with the use of low quality water, that behavior highly contributes to the high prevalence of diarrhea and malnutrition.

When asked about the reason of the low use of soap for hand washing, 61.2% of the interviewed persons answered that hand washing consumes too much soap, and that they can't afford it.

The figure below presents the place used for defecation

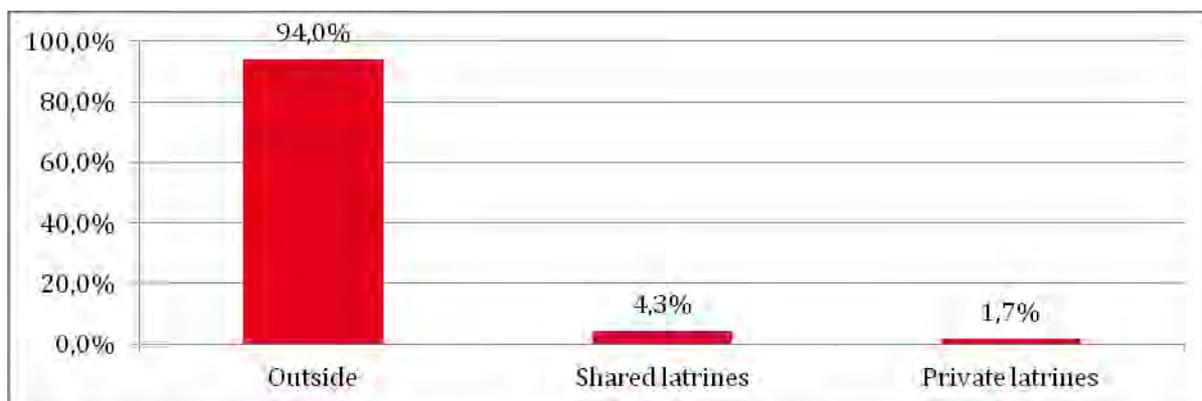


Figure 4- Places used for defecation.

Among the 445 households interviewed, 435 go out to defecate. Only 20 have access to shared latrines and 8 to private latrines. Shared latrines are generally used by 10 to 25 households.

### C. NUTRITIONAL PRACTICES

The initial KAP survey was conducted in July 2012. Back then, most of the interviewed households were in lean period. As a consequence, 45.8% of the interviewed households said they ate 2 times per day, and 54.2% 3 times per day. However, 59.5% of them said the frequency of meal evolves during the year, from 2 to 3, depending on food availability in the markets and the household income.

Frequency and composition of meals may be different for men, women and children. The table below summarizes the answers obtained for these questions

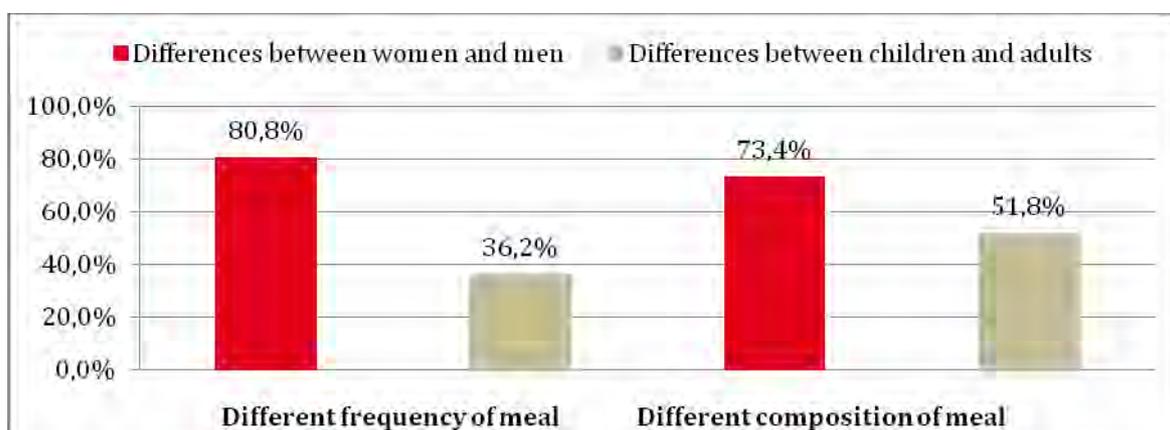


Figure 5- Proportion of households with feeding differences between men, women and children.

The next figure shows the main differences between the women, men, children and adults' alimentation:

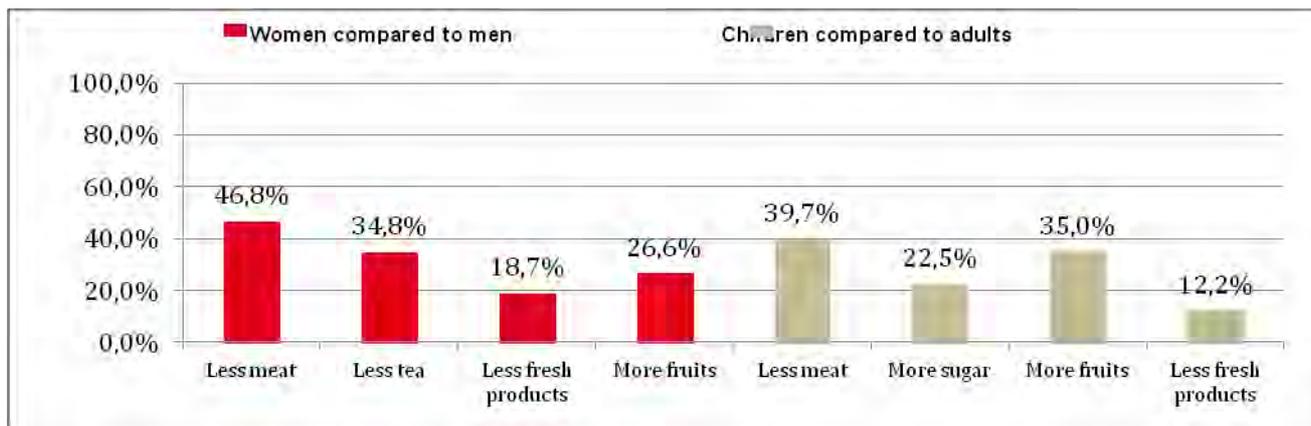


Figure 6– Women's and children's alimentation compared to men and adults.

63% of interviewed people said they consider having unbalanced meals at the survey's period (90% of them considering that a balanced meal includes meat). As the price of meat was expensive at this period, 61.2% think they didn't eat balanced meals because they couldn't afford it. Indeed, for 82% of the interviewed people, the most favorable period of the year for balanced meals is just after the harvest or during the dry season, when food is the cheapest.

Young children eat gruel 4 times a day from 6 months of age, in general. 65% of them eat the same gruel all the day. Gruel is composed by millet, sugar, flour, salt, vegetal oil and groundnut paste. Sometimes, it can be enriched with dehydrated milk, rice or sorghum. In quite rare cases, fruits and vegetables can be added to the recipe.

#### D. BREASTFEEDING PRACTICES

99% of interviewed women practiced breastfeeding. 83% of them said they'll wean their child between 20 and 24 months. However, 20% of them said they'd stop to breastfeed their child if they got pregnant again.

The next figure shows the number of breastfeeding declared per day:

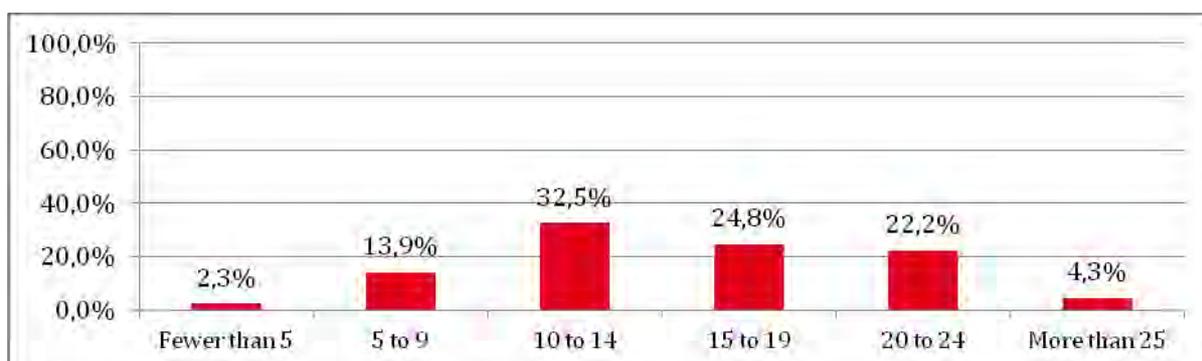


Figure 7- Number of breastfeeding in a day.

58.2% of the interviewed women said they wash their breast before feeding their child. However, only 13.8% of them wash their breast with soap. 51.6% use just water, 19.7% use a clean scarf, 15% use their own clothes. The lack of hygiene before breastfeeding appears to be a major child health problem.

On top of it, 85.2% of the mothers said they gave water to their child before the age of 4 months. Indeed, local culture says that children must be drinking water very soon, otherwise they'll be retarded. Considering that 85.2% of the households get their water from surface slicks, it appears to be a major factor of child disease.

#### E. CHILD HEALTH AND CARE PRACTICES

51.9% of interviewed mothers said their child have been sick in the last two months. Among them, the most observed symptoms are:

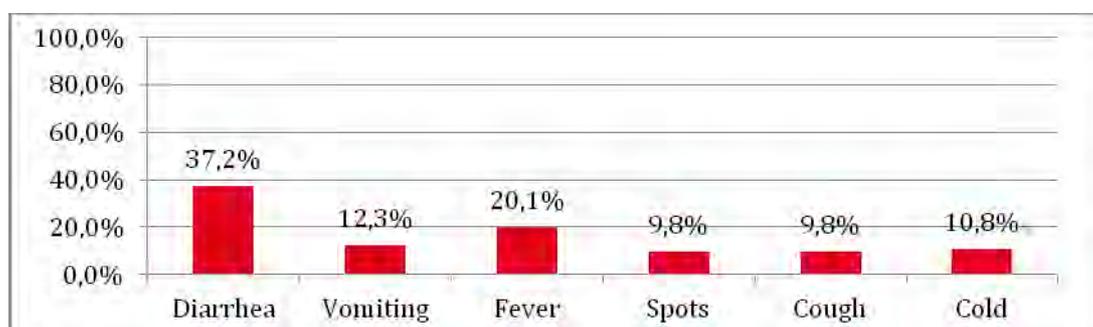


Figure 8- Main childish diseases in the interviewed households.

65.9% of the mothers brought their sick child to a health center. Among the 34.1% who didn't, 41.6% said that the Health Center services are too expensive, and 82% that it is too far from their home. The most common reaction when a child suffers from diarrhea or

vomits is to reduce the breast feeding and feeding in general (80%) and also decrease the quantity of drinking water (50%).

Several questions were asked to estimate the knowledge of the mothers concerning the cause of the disease that affect their children. The table below shows the main results:

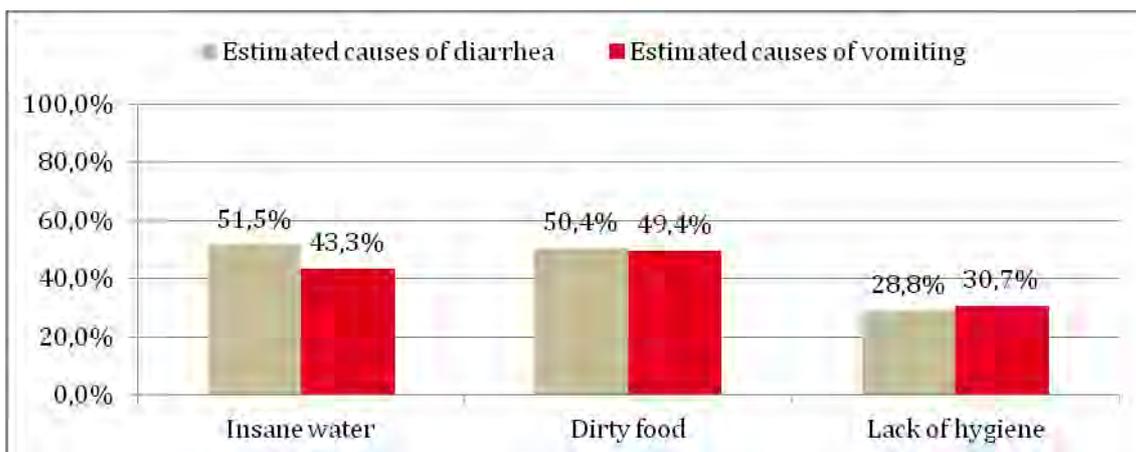


Figure 9- Estimated causes of diarrhea and vomiting.

These results are interesting, as they show that some mothers are conscious that their living condition and behavior can affect their children’s health. It seems to indicate that they could be receptive to hygiene advice.

#### F. PREGNANT AND LACTATING WOMEN CARE PRACTICES

85.9% of the interviewed women gave birth at home, with the assistance of a traditional midwife (*Dahia*). 7.4% did it alone and 7.6% in a Health Center. Most pregnant women are used to visiting a health center before the birth. The table below shows the frequency of prenatal visits:

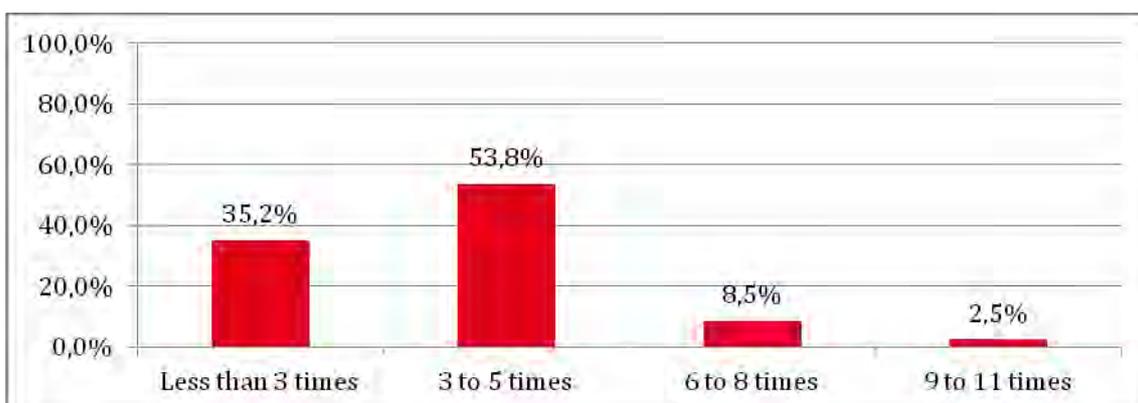


Figure 10- Number of prenatal visits during a pregnancy.

Here again, this behavior seems to indicate that pregnant women are concerned by their health, and should be opened to sensitization messages.

During the pregnancy, several women change their behavior: 64.3% use to eat less than usual. The composition of the meal is also impacted, as 32% eat more fresh products, 26.4% eat less meat, 24.5% eat more meat, 18,2% eat more sugar and 16.3% eat less sugar.

At last, we notice than women in the intervention area use to have frequent pregnancies:



Figure 11- Time waited before a new pregnancy.

## G. CONCLUSION OF THE INITIAL KAP SURVEY

This first survey shows several points as relevant for the definition of key messages for the sensitizations planned in the project. The main data gathered concerned:

- Access to water : 85.2% of the interviewed people gather their water in a wadi ;

- Hygiene : Only 14.5% use soap after defecation ;
- Diet and nutritional balance: Only 27% of the interviewed population considers that their meals are well-balanced. And for 90% of the population a diet is balanced only if it includes meat in each meal ;
- Breastfeeding: More than 98% give water to their new born baby (in the three first days) mostly without treating it first. Only 13.8% wash their breast with soap before breastfeeding ;
- Young children nutrition: The recipe of gruel lacks vitamins and presents unbalanced nutritional benefits ;
- Diet during pregnancy: 64.3% of women reduce the quantity of food consumed in a meal during pregnancy. And 26.4% of them reduce their meat consumption.

In that perspective, sensitization activities have been oriented to hygiene promotion, balanced diet, good breastfeeding practices, enriched gruel for young child, and nutritional practices during pregnancy.

### **2.1.1.3 Final KAP survey**

The final KAP survey aimed at measuring the changes in beneficiaries' practices. It was conducted in April 2012, and reached 144 women in the villages in which nutritional sensitization have been done.

#### **A. HYGIENE**

The figure below shows the proportion of interviewed beneficiaries who wash their hands and breast with soap:

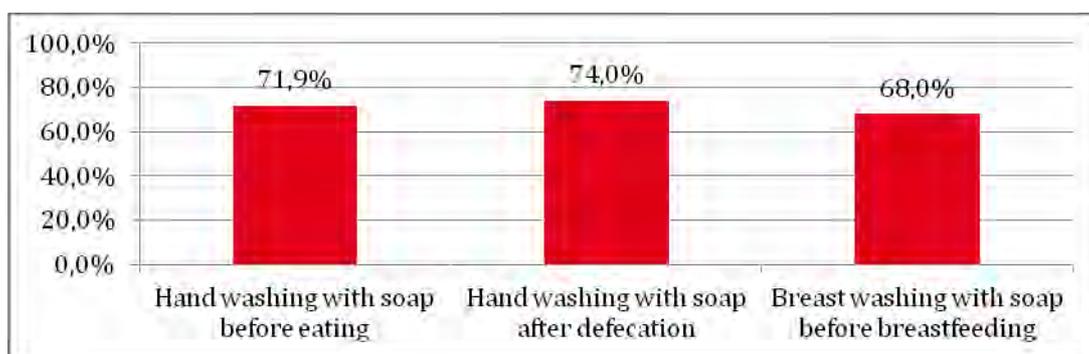


Figure 12- Proportion of sensitizations' beneficiaries using soap.

We can observe an important improvement. Indeed, 72% of interviewed women wash their hands with soap before eating, 74% after defecation and 68% wash their breast before breastfeeding. The initial KAP survey showed that only 14.5% used to use soap for hand washing at the beginning of the project.

## B. DIET DURING PREGNANCY

At the end of the project, 70.2% of women said they don't reduce their frequency of meals while being pregnant. 57.6% of them eat meat at least four times a week.

## C. YOUNG CHILDREN NUTRITION

Only 90.1% women give water to drink to their young child (younger than 2 years old) at the end of the project, and 26.8% did it for the first time after the child was 6 months old.

This shows a little progress since the beginning of the project, when 99% of women gave water to their child before its 3<sup>rd</sup> month. However, there is still work to do in that matter.

18.1% of women give enriched gruel, with vegetables added to the recipe in order to provide some vitamins to their child. Only 1 interviewed woman adds some Moringa leaf powder to the gruel, as learned during sensitization session. This weak rate is mainly due to the unavailability of Moringa in the area. This could be improved by developing Moringa promoting projects.

## D. DIET AND NUTRITIONAL BALANCE

At the end of the project, 39% of beneficiaries considered their meal as balanced. When asked about what a balanced diet is, 43% mentioned the presence of protein enriched elements, as eggs, meat and peas.

### **2.1.1.4 Conclusion of the KAP surveys**

These two KAP surveys allow estimating the impact of the project in terms of changes in behavioral practices. This is particularly obvious for the hygiene practices: at the end of the project, 74% of sensitization beneficiaries use soap to wash their hand after defecation, which represents an improvement of 60.5%.

Child care practices have also progressed. Despite the fact that potentially contaminated water is still given to very young children (younger than 3 months old), we observe an improvement of the gruel's composition; in which more vitamins are added.

When asked about what would be the most appropriate composition for a child's gruel, 35% of the interviewed women mentioned the Moringa leaf powder, which is rich in A vitamin and calcium. However, the lack of availability of these products prevents the spread of that practice. This could be resolved by future projects intending to develop a local Moringa production.

The initial KAP was also an assessment that helped PU-AMI to better understand the causes of the malnutrition rates measured in this area. It also allowed PU-AMI defining an integrated community-based strategy to fight against malnutrition prevalence. The sensitization part of that strategy was oriented thanks to these surveys.

## *2.1.2 Sub-sector 2: Monitoring of Food Security and agriculture patterns*

### **2.1.2.1 Price market survey**

During the project, the prices of the most consumed food were recorded on the main markets of Bardé canton.

The products we focused on were:

- Sorghum, millet, as the main cultural season products, and alimentation cereals base ;
- Groundnuts, as commercial products and exclusive source of oil;
- Groundnut oil, as exclusive oil source ;
- Onion, as a very appreciated market gardening product, base of all sauces ;
- Sugar, very important in local alimentation (mostly in tea).

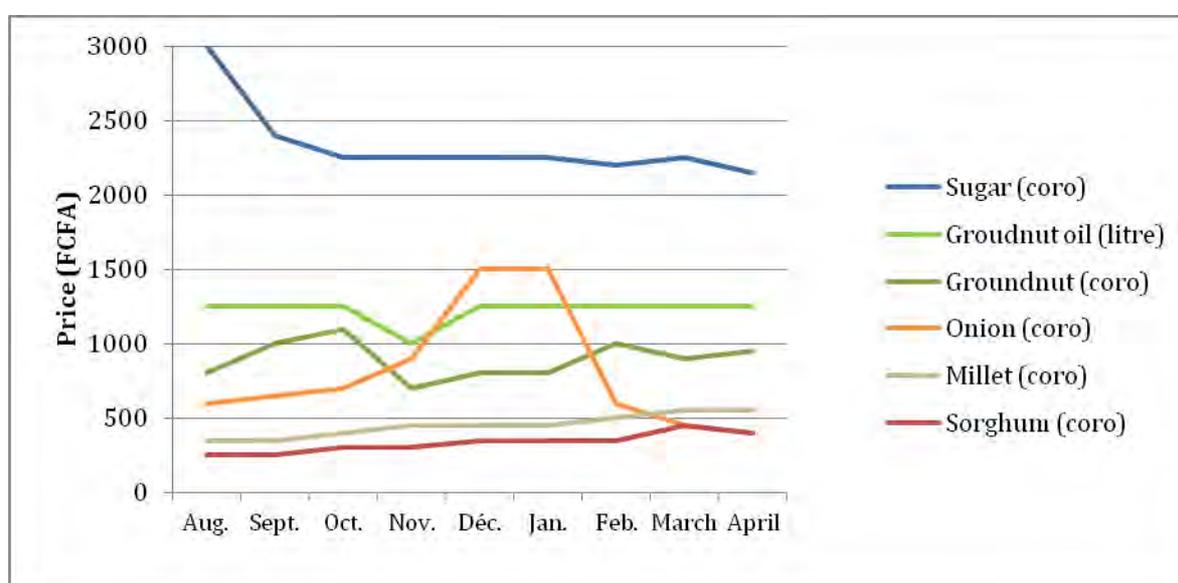


Figure 13: Graph of market price follow-up from August 2011 to April 2012

The monitoring of market price revealed an unusual variation of the prices of cereals. Indeed, cereal price normally decreases right after the harvest (in October/November) and then progressively increases again, especially during gap period (from July to September). But this year, due to the drought, the price of sorghum and millet, the most important cereals of the area, didn't fall down. Worst, the price continued to increase, even during harvests. This phenomenon could be explained by speculation; wholesalers from Chad and Sudan anticipated the cereals shortage, bought a huge quantity and created a local inflation.

Groundnut showed normal variations, but the lowest prices observed after the harvest remained high (like in a standard year in August). Groundnut oil followed the same price evolution as groundnut.

Sugar price followed its usual course: its price decreased at the end of the rainy season, when it is easier and cheaper to transport.

As a market gardening product, onion price showed an important increase from October/November to January, followed by an important fall in February (period of water fall crop harvest). The price continued to decrease during all the harvest of market gardening crop period (from February to May) and then slightly increased. Those variations were usual, price increased with product becoming rare and demand remaining constant.

The variation of the prices observed by the monitoring shows an important problem concerning the food crops (millet and sorghum), which prices were too high in the beginning of 2012, and then continued to increase. This created a food crisis among the poorest households reinforced by the low yields due to the drought.

### 2.1.2.2 Agricultural pattern

2011 harvest was deceiving, yields were low and production only reached 50% of the previous year (more details are available in the post-harvest part)

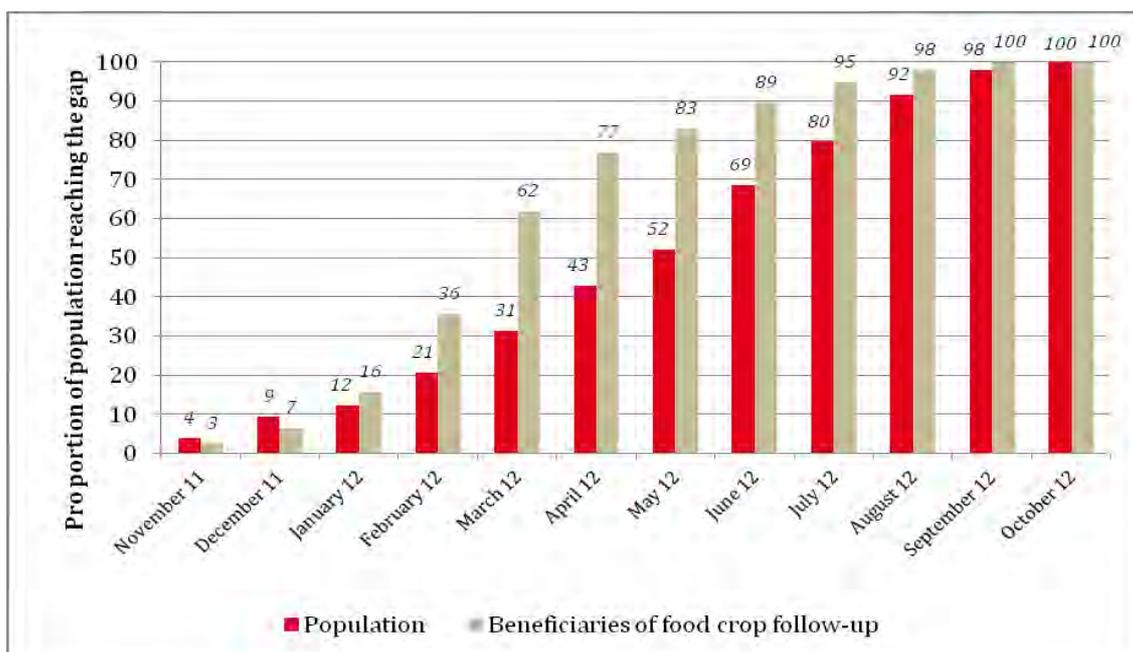


Figure 14: Bar chart of proportion of population reaching the gap each month

The majority of the population questioned estimated that their 2011 production would not exceed six months of food stock, and 9% of the respondents would not even produce the equivalent of one month of self-consumption needs. A vast majority of beneficiaries estimated that their 2011 production will not exceed 4 months of food stock.

Food insecurity in the area was expected to begin in early February and could reach alarming proportions in April if assistance was not up to scale.

### ***2.1.3 Sub-sector 3: Material support to health centers for the monitoring of malnutrition***

#### **2.1.3.1 - Health centers support**

5 health centers have been supported during this project in Arkoum, Goundiang, Allacha (Bardé canton), Borota and Goungour (Kado canton). These health centers have been helped by the national NGO BASE from 2008 to 2011, who gave them medical supplies. A stock of drugs is still available in Abéché, where the heads of the health centers can get supplies for the centers.

However, these 5 health centers are unable to look after malnourished children, as they have no trained staff to apply the Chadian National Protocol, neither anthropometric material nor specific supplies for the systematic treatment of new registered malnourished children (A vitamin, measles vaccines...).

The anthropometric material given by UNICEF to PU-AMI for the realization of the SMART nutritional survey conducted in both Bardé and Kado cantons in February 2012 was given to the leaders of the Health Comities. It is a first step to support the health centers to a performing malnutrition management's system.

Supplementary Plumpy, also given by UNICEF, was distributed to the 5 health centers to help them manage the cases of moderately malnourished children detected by the community volunteers during two months. In total, 27,104 Supplementary Plumpy doses were given to the health centers.

### **2.1.3.2 - Construction of nutritional education centers**

In order to support the monitoring and prevention of malnutrition, 7 nutritional education centers have been built near health centers (in Arkoum, Goundiang, Allacha, Borota and Goungour), and in villages without health centers but having a big market (Hilledeye and Ngueri). These education centers were built by the community with local material. They consist in shelters measuring 6m x 4m, with a roof in millet stalks. The decision to build these centers was motivated by the necessity to have a place reserved to:

- Nutritional training, especially for mothers with young children (younger than 5) ;
- Agriculture products transformation, equipped with mills, for the preparation of enriched gruel
- Hygiene promotion, through awareness sessions ;

The 7 nutritional education centers were finished in March 2012. 10'000 FCFA (about 19\$) have been given to the people involved in their construction. The money was used to buy the millet stalks for the roofs.

The nutritional education centers are supported by:

- Health officers : Nurses from health centers and community health workers ;
- COSAN (local health committees) ;
- Community volunteers trained by PU-AMI.

At the end of the project, the 7 nutritional education centers still existed, but needed support to have full activity. Indeed, the people in charge of these centers found it difficult to buy products to make improved gruel and animate trainings.

### **2.1.3.3 - Community volunteers' training**

In order to initiate a performing monitoring system involving the communities, 176 community volunteers have been trained by PU-AMI's team. Efforts have been made to train about 50% women, as they have an easier access to young children and can relay nutritional advices to the mothers. These volunteers are:

- 82 in the Bardé Canton: 43 men and 39 women;
- 94 in the Kado Canton: 53 men and 41 women.

These community volunteers have been trained between February and March 2012 to be able to detect children suffering from malnutrition (by the measurement of Brachial Perimeter), recognize the type of malnutrition detected and guide the children to the most appropriate health center.

These trainings took place during 2 to 3 days: 1 or 2 days for the theory followed by 1 day for practical lessons. During these trainings, community volunteers learned to detect severe or moderate acute malnutrition cases by measuring the Brachial Perimeter with MUAC given by PU-AMI at the end of training. The criteria of reference to Supplementary Feeding centers (SFC, in the health centers) and Outpatient Care Sites (OCS, managed by IRC in the north of Barde canton) are:

Case	Condition	Referencing
Severely malnourished	BP* < 115mm Or Bilateral Oedema	IRC nutritional center (Hadjer Hadid)
Moderately malnourished	115 < BP* < 125mm	Local health center
Pregnant or breast-feeding women		Local health center

Table 6- Criteria used by community volunteers to referencing malnourished children<sup>7</sup>

\*BP = Brachial Perimeter

At the end of the project, 484 children in both Barde and Kado cantons suffering from Moderate Acute Malnutrition have been detected and referred to the nearest health centers. Supplementary Plumpy given by UNICEF was given to the health comities to manage these cases for two months.

64 children severely malnourished were also identified and referred to IRC's Outpatient Care Sites in Tréguine and Bredjing refugee camps, in the north of Bardé canton.

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<sup>7</sup> Chadian Protocol for Nutrition

These children were still treated by IRC and in the health centers at the end of the project. PU-AMI's malnutrition management program, starting in July 2012, will allow measuring the cure rate of these children, and follow the treatment if they're still sick.

#### ***2.1.4 Sub-sector 4: Sensitization and training on good nutritional practices***

##### **2.1.4.1 - Beneficiaries identification**

The identification of the beneficiaries for the sensitization and training started at the beginning of the project, lasting until December 2012. 2,077 persons have been identified (70% in Barde canton and 30% in Kado canton). The criteria of identification were:

- Household with children under 5: 937 households (45%);
- Households with a pregnant woman: 593 (28%);
- Households with lactating woman: 326 (16%);
- Households with women in age of procreation (15 years to 49): 221 (11%).

These beneficiaries have been followed during the whole project through several training sessions.

##### **2.1.4.2 - Moringa's nutritional properties**

The first training session was conducted in September 2011 and was about the use of Moringa leaf powder for food consumption, especially to make improved gruel for young children. Indeed, Moringa leaves are very rich in nutriment such as calcium, A and C vitamins, protein and potassium. The figure below summarizes the properties of Moringa leaves:

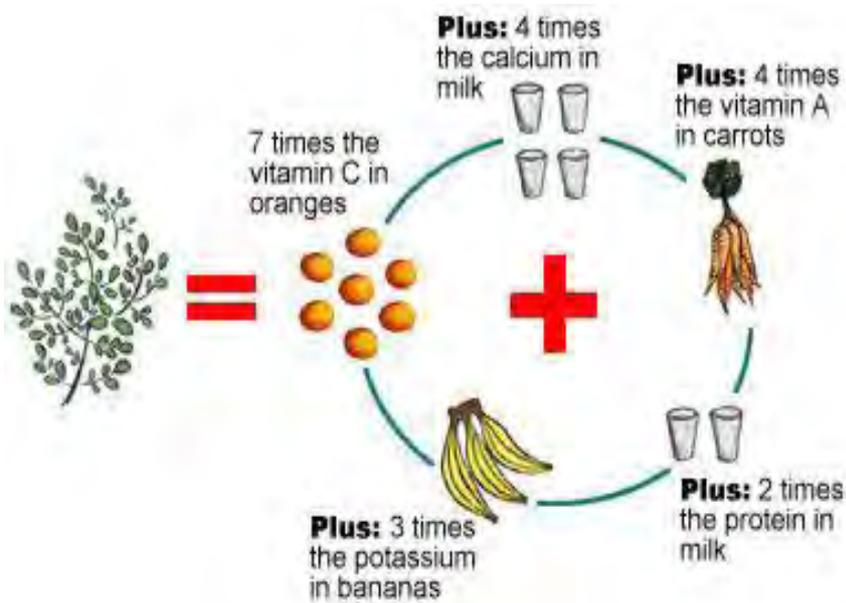


Figure 15- Nutritional properties of Moringa leaves

This fast growth tree is usually used in South Chadian and Sudanese kitchen to improve nutritional quality of gruel and sauces. It was inexistent in the area so the introduction of this species is an experiment and future cook training will be conducted as soon as it is possible to take leaves without damaging the tree.

1,668 women took part in this training. A young Moringa plant, coming from PU-AMI's tree nursery in Hadjar Hadid, was given to each participant. In February 2012, 82% of these plants were planted and looked after.

45 Moringa plants were also given to community volunteers, and 200 were planted around the health centers.



Figure 16- Moringa distribution in Allacha

#### 2.1.4.3 - Hygiene promotion

27 training sessions about breast-feeding practices, corporal and food hygiene, water treatment (using *Moringaoleifera* seeds) and food conservation techniques took place in 5 nutritional education centers. 1,519 beneficiaries participated in these trainings, including 176 community volunteers.

The Hygiene sessions were conducted with the participation of PU-AMI's WASH team.

#### 2.1.4.4 - Cooking lessons for community volunteers and women

Several cooking lessons took place in the 7 nutritional education centers improved during the project (see sub-sector 3). They intended to teach cooking techniques to women and community volunteers providing good nutritional practices.

Training's topic	Canton	Nutritional education center	Number of trainees		
			Men	Women	Total
Malting and treatment of ingredients	Barde	5	37	121	158
	Kado	2	36	69	105
Enriched gruel	Barde	5	43	135	178
	Kado	2	27	81	108

Table 7 - Number of participants of the cooking demonstrations

The malting techniques consist in the germination of sorghum before the cooking. The germination provides amylase development, which help children to improve the assimilation of the gruel.

#### DISTRIBUTION OF TRAINING MATERIAL

At the end of the training sessions, material was distributed at the nutritional education centers. These training kits will stay in the centers, where they can be used by beneficiaries in order to practice the new techniques learnt or to train other people.

Canton	Nutritional education center	Booklet	Moringa leaf powder (Kg)	Handmill
Bardé	5	75	33	42
Kado	2	50	18	43
<b>Total</b>	<b>7</b>	<b>125</b>	<b>51</b>	<b>85</b>

Table 8- Training material distributed.

### **2.1.5 Sub-sector 5: Agricultural product processing kit**

#### **2.1.5.1 - Installation of equipments in the nutritional education center**

#### COMBINED MILLS

7 combined mills (cereals and groundnut) have been implemented in 7 villages. The list of the villages is presented below:

<b>Canton Barde</b>	<b>Canton Kado</b>
Allacha	Borota
Arkoum	Goungour
Goundiang	
Hilledeye	
Ngueri	

Table 9- List of the villages equipped by combined mills.

The mills have been installed in the 7 nutritional education centers. Management Comities have been organized to ensure the running of the mills. Each Comity participated in a training session about the mills' utilization and maintenance. After the trainings, a kit composed by a bag of groundnut, a bag of sorghum, a bag of millet, 10 Kg of sugar and 5 Kg of Moringa leaf powder was given to each comity.



Figure 17- Combined mill installation in Borota, March 2012

The Management Committees are composed of men and women from 7 villages around the nutritional education center, with 4 people (2 men and 2 women) from each village. At the end of the project, the comities have difficulties to generate incomes to run the mills. Further support is needed, which can be done in the new project proposed to OFDA.

### OTHER EQUIPMENTS

In March 2012, each nutritional education center was equipped with material to process agriculture products and make enriched food. These kits were composed of:

- 40 plastic goblets ;
- 1 pot ;
- 225 liter cans ;
- 2 wood tables ;
- 2 wooden pestles.

This material is still managed by the committees, and could be used in further nutritional practices promotion projects.

## 2.2 SECTOR 2: AGRICULTURE AND FOOD SECURITY

<b>Objective:</b>	To restore food security among vulnerable IDPs and host populations by supporting agricultural production and livestock.
Number of Beneficiaries Targeted	7,800 beneficiaries – 1,300 Households
Number of IDP Beneficiaries Targeted	3,900 beneficiaries – 650 Households
<b>Achievement</b>	15,094 beneficiaries – 2,500 Households (farmers and breeders)
<b>Sub-sector Name:</b>	Seed Systems and Agricultural Inputs
<b>Indicator 1:</b>	<b>Projected increase in number of months of food self-sufficiency due to distributed seed systems/agricultural inputs for beneficiary families</b>
<i>Target</i>	+ 5 months
<b>Achievement</b>	+ 2 months : the target is not achieved due to the drought which has affected the program area
<b>Indicator 2:</b>	<b>Number of people benefiting from seed systems/ agricultural input activities:</b>
<i>Target</i>	6000 persons (1,000 households)
<b>Achievement</b>	7,800 persons (1,300 households) for pluvial crops and 5,880 persons (980 households) for market gardening
<b>Sub-sector Name:</b>	Livestock
<b>Indicator 1:</b>	<b>Number of animals benefiting from or affected by livestock activities</b>
<i>Target</i>	1,800
<b>Achievement</b>	24,631 animals affected by livestock activities
<b>Indicator 2:</b>	<b>Number of people benefiting from livestock activities :</b>
<i>Target</i>	600
<b>Achievement</b>	1,414 breeders split in 79 breeders' group
<b>Sub-sector Name:</b>	Veterinary Medicines and Vaccines
<b>Indicator 1:</b>	<b>Number of veterinary interventions, treatments or vaccinations administered :</b>
<i>Target</i>	127,000
<b>Achievement</b>	20,911 interventions
<b>Indicator 2:</b>	<b>Number of animals treated or vaccinated</b>
<i>Target</i>	45,000
<b>Achievement</b>	18,088 heads vaccinated <sup>8</sup>
<b>Indicator 3:</b>	<b>Percentage of animals identified during campaign vaccinated against symptomatic coal, anthrax and pasteurellosis</b>
<i>Target</i>	100%
<b>Achievement</b>	100% of animals identified during the campaign has been vaccinated <sup>9</sup>

### 2.2.1 Sub-sector 1: Seed systems and agricultural inputs

#### 2.2.1.1 - Beneficiaries identification and sensitization

<sup>8</sup> Due to an overevaluation of the target, as shown by the third indicator

<sup>9</sup> Except against anthrax for cattle in gestation (to avoid abortion)

## PLUVIAL FOOD CROP

The 1,300 households (average household of 6 persons which means 7,800 direct beneficiaries) were identified by PU – AMI's team in close co-operation with representatives of villages and IDPs committees.

Target population is composed of 45% of IDPs willing to stay for at least one additional agricultural season or willing to definitely settle in the area, and 55% of the most vulnerable local households. The beneficiaries are all from Barde Canton (from 42 different villages).

The selection criteria of direct beneficiaries are:

- Women head of families with children;
- Households having an annual income below 250,000 FCFA with lack of complementary income;
- Households with an insufficient production to ensure a food self-consumption of 8 months;
- Households with no livestock (except poultry and donkey);
- Households with elderly, handicapped or extremely vulnerable persons;
- Access to land;
- Experience in agriculture;
- Willingness to integrate groups' agricultural activities;
- At least one member physically able to work;
- Households which are not helped by any other NGO agricultural program.

If most households will have access to agricultural inputs for the next season, the late beginning of this rainy season and a sowing at the very first rains has caused low germination rate.

To avoid such problem, which causes low harvest, small quantities of FAO seeds (millet, sorghum and local bean (niebe)) have been distributed to the selected beneficiaries (1,300 households). Those seeds will allow a second sowing or a parcels' enlargement of the most vulnerable people who lost seeds. Daba (local hoe) has also been distributed to the

1,000 most vulnerable household beneficiaries and gumbo seeds to the women head of family with children (households of at least 3 persons).



Figure 18: Photo of a food crop seeds distribution in Arkoum (July 2011)

Those beneficiaries have been followed during the agricultural campaign thanks to community relays and PU staff.

## MARKET GARDENING

A total of 1,080 vulnerable households (average household of 6 people, that is 6,480 direct beneficiaries) had been identified as beneficiaries of the market gardening seeds in 42 villages of Bardé Canton, in close co-operation with local authorities and IDP committees.

Beneficiary selection criteria were identified in collaboration with communities. The final selection criteria for market gardening seeds are as follows:

- Access to a potential market gardening land (access to land with a nearby water point);

- Women head of families with children;
- Households having an annual income below 250,000 FCFA with lack of complementary income;
- Households with no livestock (except poultry and donkey);
- Households with elderly, handicapped or extremely vulnerable persons;
- At least one member physically able to work;
- Willingness to integrate learned agricultural techniques in cultivation practices;
- Households who have not received help from other NGOs or agricultural programs;

Beneficiaries are composed of 15% IDPs, most of whom are willing to stay through the market gardening season, and 25% former IDPs now considered to be integrated and who plan to settle indefinitely in the area. A total of 89% of the identified beneficiaries are women.

The follow up of beneficiaries will be carried out throughout the market gardening by community volunteers and PU-AMI staff.

### **2.2.1.2 - Monitoring of food crop seeds cultivation**

#### **A. FOLLOW-UP**

The follow-up of food crop seeds is still essential to maximize the production in order to reduce the risk of low yield and increase the food self-sufficiency. Due to the large number of beneficiaries, and in order to reinforce the responsibility of communities, focal persons are selected per village to become community relays. Those persons will be trained by PU-AMI agriculture monitors on cultural techniques to skill them in following-up and training of beneficiaries on those techniques.

Community relays have to respond to a certain number of criteria as follows:

- They are identified beneficiaries of the program and they have received seeds;
- They have to be experimented farmers that can be recognized by the community as a key person regarding agricultural practices;
- They are key persons in their village, well-known, respected and listened to;

- They agreed to invest time and are motivated by this program;
- They are able to speak and understand local Chadian Arabic and Massalite (even if they cannot write and read it).

A total of 42 community relays have been identified, trained and followed all along the program. Periodic meetings, between community relays and PU - AMI staff, allowed exchanging on any agricultural issue and giving quick answers to any fear they might have had.

At the end of July, a follow-up of sowing has been done 1,300 households targeted and proved that around 96% of the vulnerable households have grown millet and sorghum. Around 60% of them also sowed groundnuts. Only a few part (less than 10%) of them have sowed local beans, sesame or vonzu peas.

The fears mentioned during the periodic meetings and close follow-up also allowed PU-AMI staff to tackle the problems such as locusts by training community relays on making bio-pesticides with local resources or using chemical pesticide without risks, especially during pulverization.



Figure 19: Photo of a general meeting with relays meeting in Alacha (September 2011)

Finally, square yields were settled and taken down during the harvest period, after a training session devoted to this monitoring method. Each community relay had to settle

three square yields in all their fields. Production rate in the square yields were measured with the help of PU-AMI's agents. Those following data were used to compare with yield calculated thanks to the post-harvest survey. It also allows to have an idea of the production rate of food crops distribution beneficiaries, and indicates the quality of the seeds.

Crop	Millet	Sorghum	Local beans
Square yields 2011	330 kg/ha	160 kg/ha	25 kg/ha

Table 10 : Square yields results

These results are compared with the post-harvey survey's estimation in the following part.

## B. POST-HARVEST SURVEY

### o **Methodology**

PU-AMI carried out a post-harvest inquiry in Bardé and Kado Cantons. 37 villages of each Canton were drawn and 20 households, chosen thanks to the cluster methodology, had been interviewed. A sample of 377 households, of 20 clusters in 17 villages, had been questioned in the South Bardé Canton. This sample size is representative for a population of 7,000 households, with a variability of 50% and a margin of error of 5%. To compare and evaluate the project 152 food crops seeds beneficiaries had also been queried.

### o **Main results**

#### ***Land access***

A large majority of interviewed households possess their own land, inherited for most of them. Some households hired land, in cash or in kind, from family or neighbors. Lands rented in cash (over 7% of land access for beneficiaries) were usually the most fertile plots on ouaddis' bank or in dip to grow sorghum (distributed in food crop seeds kit).

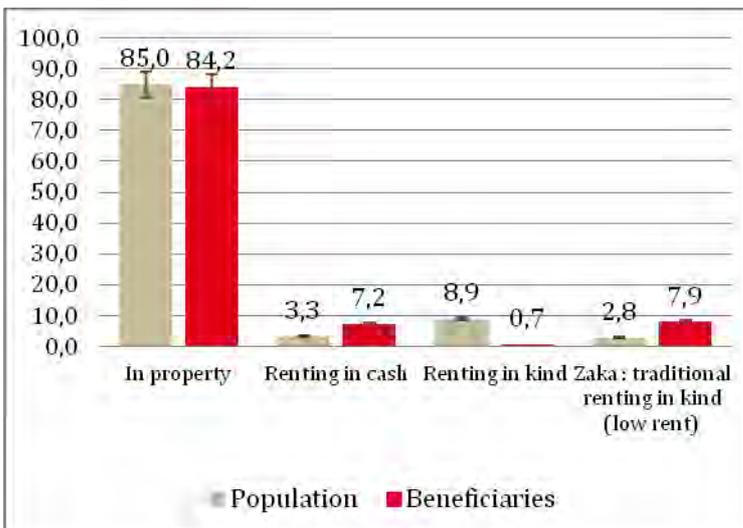


Figure 21: Bar chart of different land access type

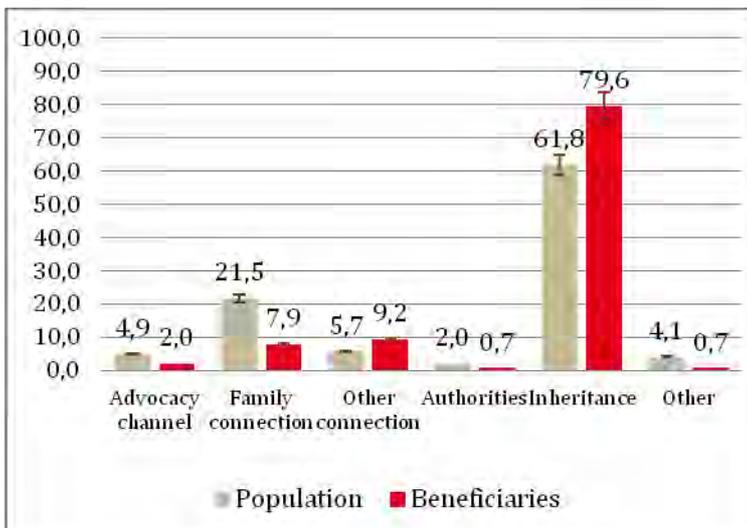


Figure 20: Bar chart of way of land access

Zaka, which concerned most of the beneficiaries, was a traditional type of renting. The farmer only gave a part of his crops if the harvest were good; he could keep all the production if it was not sufficient to spend the year. These types of land were regulated by the village leader and were rented to the poorest.

Advocacy channel to grant an access to land mostly concerned returnees, for which NGO and authorities worked for land release to facilitate their settling back home.

**Cultivated surface area and type of soil**

The average surface area of a household exploitation was around 2ha. This surface area tended to increase each year. This extension was mostly due to enlargement of the households land to fertility decrease (which caused yield decrease and a need of extension to maintain the same level of crop stock). Due to limited land resources, the expansion was only possible on poor soil (mostly goz: sandy soil or even stony one).

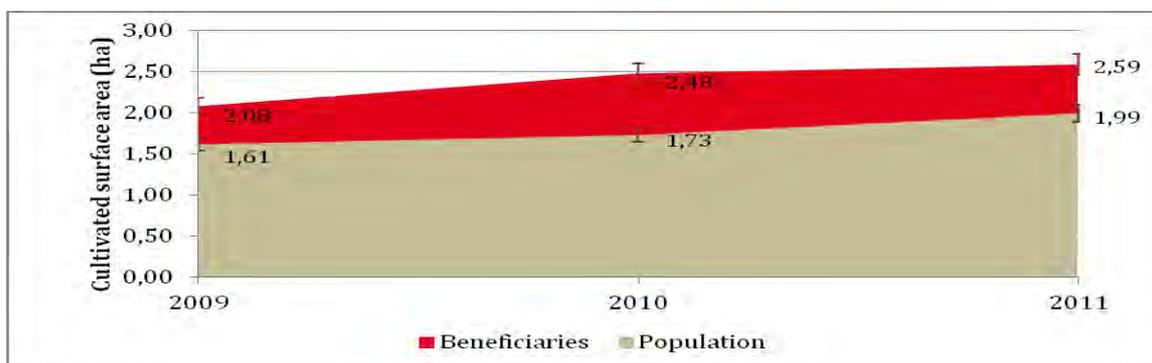


Figure 22: Graph of cultivated surface area over the year

The cultivated surface area of beneficiaries was a bit bigger than the average. This could be explained by the type of soil owned by the beneficiaries. Indeed, most of them possess very poor soil plot (stony one) and rented the good one (*ouaddi* and *djogoloy* one), whereas population average did not usually rent good plots.

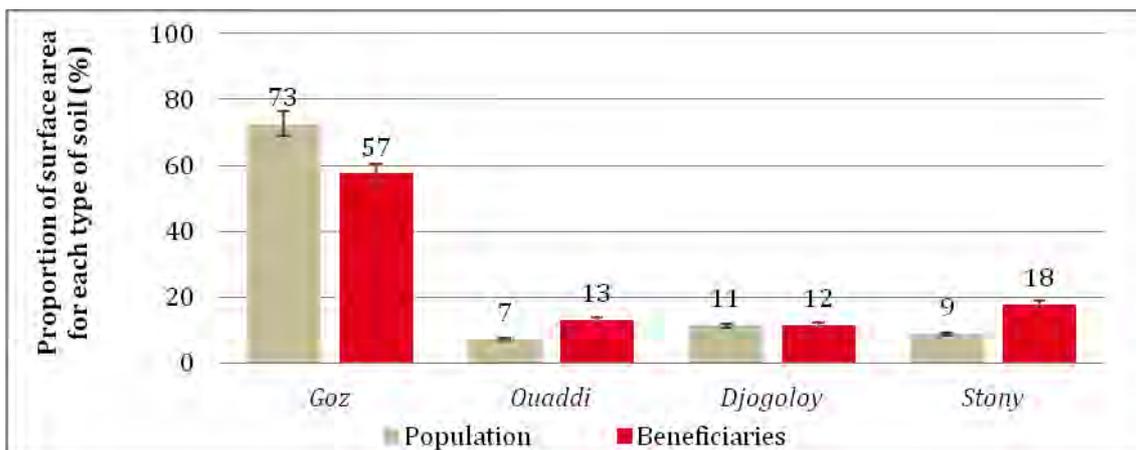


Figure 23: Bar chart of surface area proportion for each type of soil

The most common type of soil in the area is *goz*, sandy soils found quite everywhere. Stony plot appeared where the parent rock outcropped, generally on the upper spots. Those types of soil are mainly used for millet and groundnut cultivation, both little demanding crops.

Good soils, exploited with sorghum and counter-season market gardening, are on ouaddis berks and dip. These soils, called *ouaddi* and *djogoloy*, are composed of sand and clay, the latter traps organic matter (enriching the soil) and increase the water retention. *Ouaddi* soils also have silt matter, low slope but are often flooded during heavy rain. These floods can cause crop destruction by plant bending or roots asphyxiation.

Each type of soil and generally associated crop are drawn on diagram below.

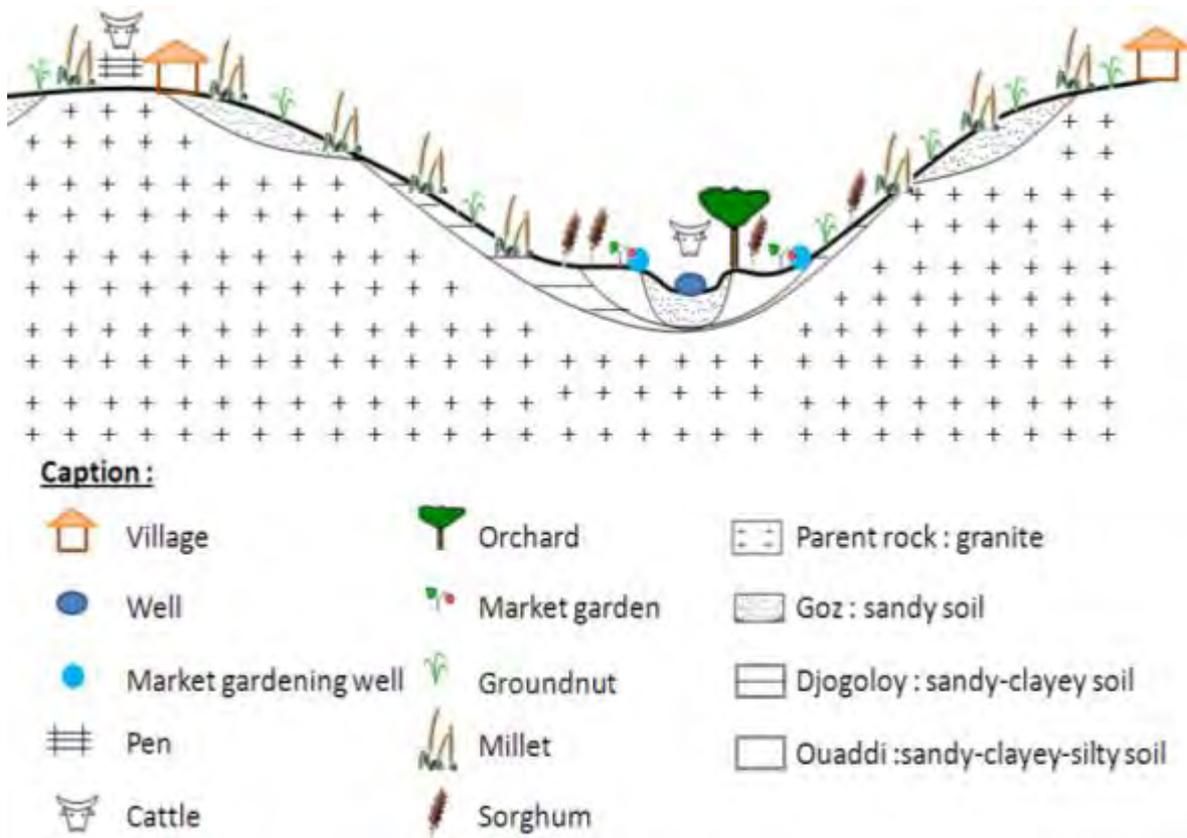


Figure 24: Cross section of ouaddi zone

### ***Crop cultivation***

Among the population, 95% of respondents grow millet on an average surface area of 1.1 hectare; 95% grow groundnuts on 0.8 hectares; 45% of households, those who own land near to a river (ouaddi), grow sorghum on an average surface area of 0.5 hectares and 10% grow local bean on 0.2 hectares. There are few differences between global population and beneficiaries except for sorghum grown by 78% of the beneficiaries and local bean cultivated by 43%. The sorghum and the local bean seeds were part of the FAO distributed kit (see chart).

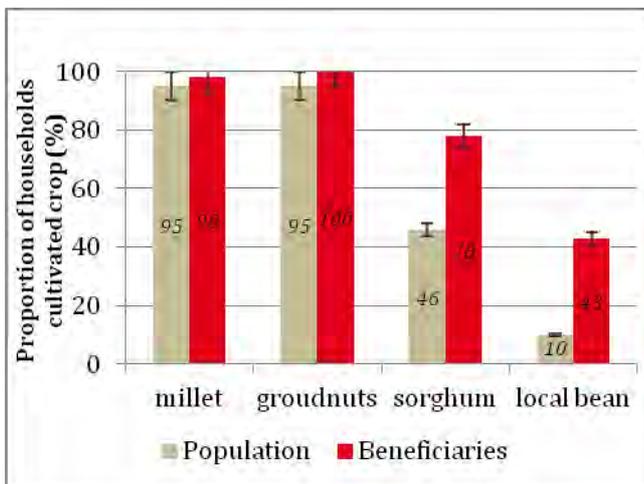


Figure 25 : Bar chart of households cultivated crop proportion

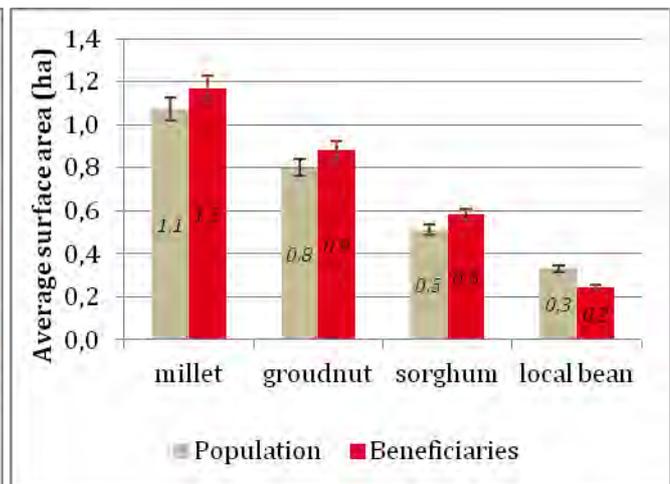


Figure 26 : Bar chart of average surface area for each crop

Among both population and beneficiaries, around 25% of the plots were cultivated with a crop association, mostly groundnuts or local bean with sorghum.

#### **Working capacity**

Households had between 1.5 to 2 active persons working per hectare. For one hectare, only 1.1 or 1.2 active person from beneficiaries' households worked. This difference could be explained by the fact that beneficiaries were selected on criteria of few active people per dependant members. Moreover they tend to have larger surface areas to cultivate.

However, according to the number of working days needed per month for a classic farm (1.8ha for millet, groundnut and sorghum cultivation), only two active members for the whole surface area were absolutely needed during work peaks (56 days of work). So, for a classic way of farming, one active person per hectare was enough.

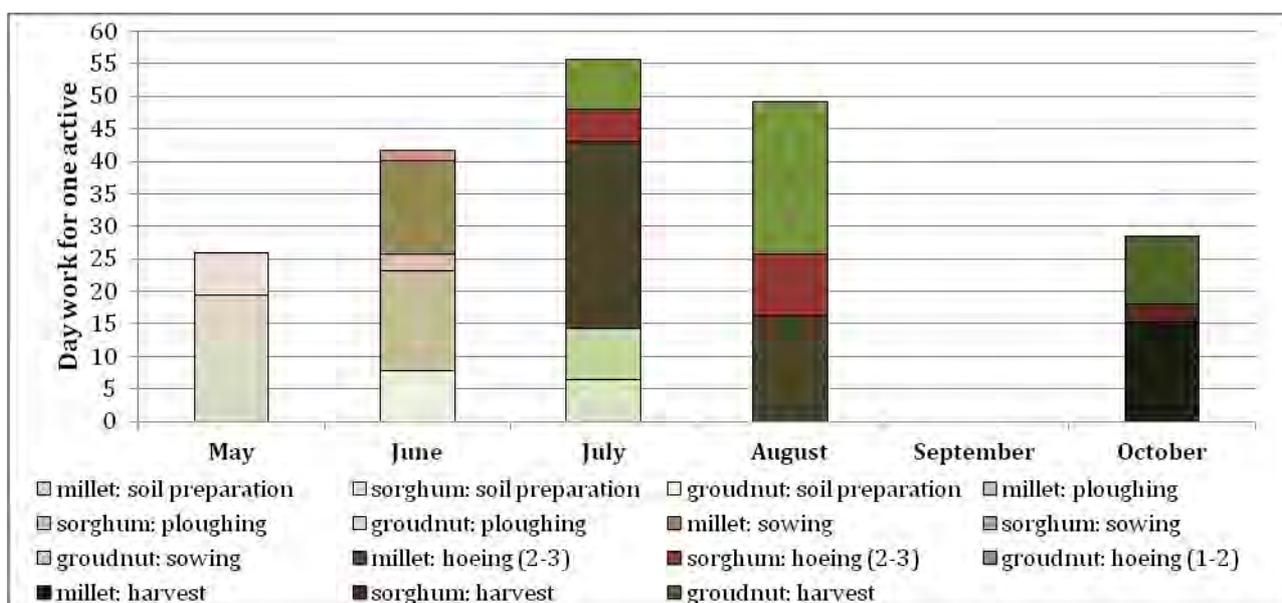


Figure 25: Bar chart of an agricultural working calendar for an average farm

Nevertheless, according to yield, it seemed that when more active people worked the same surface, the farming was done better. A careful hoeing enhances the plant growth and could increase the final production. A supplementary worker might be interesting, more than anything when the active people are weak such as pregnant women, children, handicapped or malnourished persons.

### Sowing

That difference of number of active workers partly justified the lower density of sowing. The other cause of such a difference was the accessibility of seeds for beneficiaries (poorer than the average population). A lower sowing density could impact on harvest.

	Population (kg/ha)	Beneficiaries (kg/ha)	ONDR's recommendations (kg/ha)
millet	12,0	9,2	7
groundnut	44,3	51,2	50
sorghum	12,6	10,4	15
local bean	12,4	9,6	-

Table 11: Sowing density comparison

Population, who began to sow after the first June rain, had to sow again due to the late rainy season start. This late sowing shortened the plant growth cycle, and impacted the yields. Indeed, millet had a growth cycle of 90 days at least (for precocity varieties).

Around 120 days were needed to a complete sorghum development and 90 to 120 days for groundnut. Without a full development time, plants could not produce ear and grain.

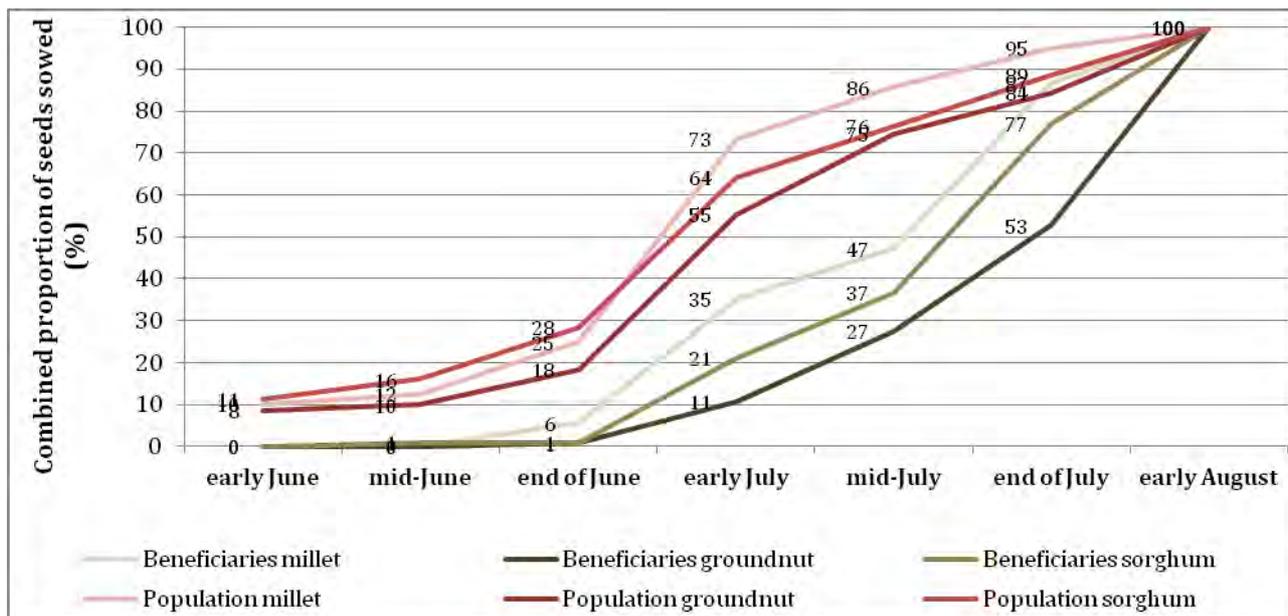


Figure 26: Graph of evolution of sowing of each crop at the beginning of rainy season

### 2011 harvest

Thus in 2011 approximately 50% of the total cultivated area might be harvested for the population average and only 35% for the beneficiaries (which are the most vulnerable).

Crop	Global population yields 2011 (kg/ha)	Beneficiaries' yields 2011 (kg/ha)	Square yields 2011 (kg/ha)	Average yields for a non-drought year <sup>10</sup> (kg/ha)
Millet	260	190	330	600
Sorghum	260	190	160	600
Groundnut	260	190	-	700
Local bean	90	100	25	-

Table 12: 2011 yields comparison

<sup>10</sup> Source : ONDR HadgerHadid

Poor harvests in 2011 were primarily due to drought and its consequences such as neglected state of plot due to the hardness of soil and/or the dryness of young plants and ravage by pests (primarily locusts and grain-eating birds).

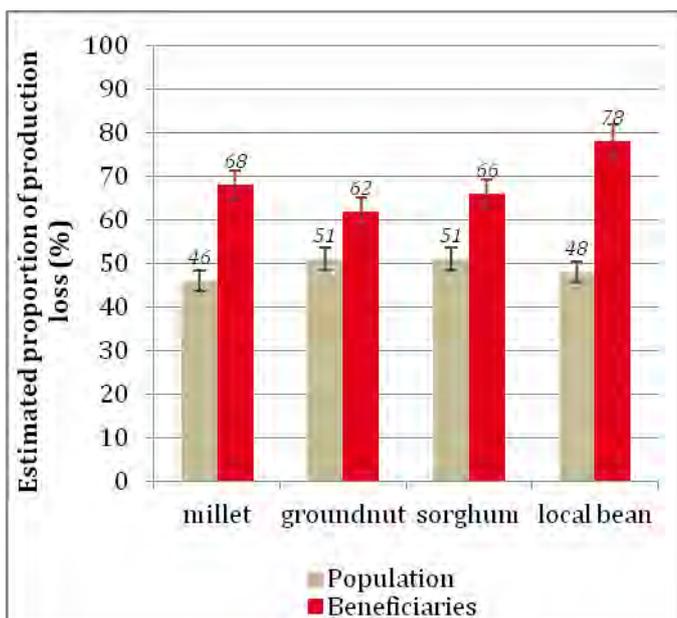


Figure 28: Bar chart of estimated loss of production for each crop

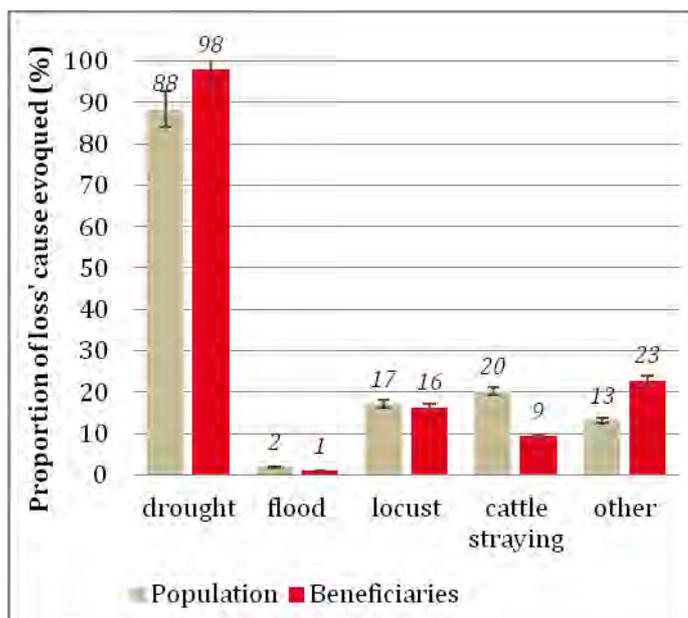


Figure 27: Bar chart of main causes of production's loss

Population estimated the loss at 50% of the total production and beneficiaries around 65%. Beneficiaries were more concerned by drought due to their more draining soil because of their location on the upper area. However, those locations avoided cattle straying, mostly concentrated near water points.

Finally yields differences between population and beneficiaries could be explained by several reasons:

- Beneficiaries' soil were poorest than average population : more stony plot and sandy plot on the upper place;
- Beneficiaries sowed lately compared to population;
- Beneficiaries had less seeds than the average population (lesser sowing density);
- Beneficiaries had less workers for more surface area;
- Beneficiaries crops had been ravaged by pests more than population ones;

- Beneficiaries might underestimate their production to increase their chance of benefiting from a potential future help.

Whatever the differences between population and beneficiaries, 2011 harvests were cruelly low. Over 50% of beneficiaries were bridging the gap since March 2012 (only 4 months of self-sufficiency). Half of the population bridged the gap in May 2012 (6 months of food sufficiency).

### **2.2.1.3 - Market Gardening production support**

#### **A. DISTRIBUTION**

PU-AMI identified 1,080 vulnerable households throughout 42 villages to benefit from market gardening seeds distribution. A total of 980 beneficiaries' households (average household includes 6 persons, total being then 5,880 direct beneficiaries) were present during distributions. Most of the absentees were IDPs who had already returned to Kado Canton, and will be integrated in the other distribution program for returnees.

Beneficiaries were encouraged to organize themselves into farmer's cooperatives, and 52 groups were formed (49 of the cooperatives now remain active after three IDPs groups returned to their Canton of origin). The seeds kits were distributed individually, whereas tools (such as wheelbarrows and ropes) were donated to the groups as a whole.

The market gardening kit is composed of different selected varieties such as:

- Short cycle productions that can quickly be ready for harvest and sale (ex. arugula, spinach, *cocoris*);
- Long cycle productions, that can be stored and progressively sold on the markets (ex. onions, gumbo, tomato, garlic);
- Daily consumed products (onions, garlic, okra, tomato);
- New varieties that have been experienced in previous projects and which had a great success with beneficiaries (potatoes, Roma tomatoes, eggplant, arugula);
- Brand new varieties with high dietary value(carrot, beetroot, spinach) which will be introduced through nutritional demonstrations;

- Varieties to generate a supplementary income, such as garlic and beetroot (according to a 2010 market gardening study in Hadjer Hadid);
- Less attractive varieties for cattle in order to reduce grazing risks (onion, garlic).

All of the selected seeds varieties meet the following requirements:

- Easy installation of the nursery;
- No need for chemicals to protect crops;
- Adequate with local consumption habits.

Market gardening crop	Quantity initially planned per kit (grams)	Quantity distributed per kit (grams)	Beneficiaries	Total quantity distributed (kg)
Onion	25	25	980	24,5
Okra	30	30	980	29,4
Tomato Roma	2	3	980	2,9
<i>Cocoris</i>	10	10	980	9,8
Carrot	3	3	980	2,9
Garlic	1,000	1,500	980	1470
Potato	1,500	1,500	980	1470
Beetroot	0	3	980	2,9
Eggplant	0	2	980	1,9
Spinach	0	10	980	9,8
Arugula	0	10	980	9,8
<b>TOTAL KIT</b>	<b>2,570</b>	<b>3,096</b>	<b>980</b>	<b>3034</b>

Table 13: Market gardening seeds kits and quantities distributed

Sensitization on the nutritional values of the seeds distributed and techniques of caring for the nursery were carried out with beneficiaries during distributions.

## B. MONITORING OF MARKET GARDENING CULTIVATION

### o Follow-up

A daily follow-up of market gardening activities was led by PU-AMI staff. The follow-up was done directly on beneficiaries or community relays' plots. For each visited plot, a form based on PU-AMI monitor observation was filled in. These evaluations were a mean of adapting training to needs and reinforce rapidly the lack of knowledge of the beneficiaries on some practices. On these forms, a part was prevailed to write down any piece of advice

given to the farmers. This advice was then also given to the relay to spread the information to everyone.

Three sessions of follow-up were done (one after each training on agricultural practices). In each session, 2 to 3 beneficiaries and the community relay of each village were visited.

Beneficiaries' market gardening plots usually had 80 to 100m<sup>2</sup> surface area. A traditional well was dug in the center of the plot and traditional irrigation channel were fashioned in the clay.



Figure 29: Photo of a traditional market garden irrigation system in HiléDyé (February 2012)

The plot was then shared in beds for each type of production (as summarize in the table below). All plots were enclosed with traditional fences.

Market gardening crop	Cultivation rate (in % of beneficiaries)	Surface (number of bed of 1m <sup>2</sup> )
Onion	99%	21
Garlic	97%	12
Tomato Roma	84%	5
Eggplant	61%	2
<i>Cocoris</i>	91%	5
Arugula	88%	4
Okra	90%	12
Potato	72%	2
Beetroot	36%	2
Spinach	41%	2
Carrot	22%	2
<b>Total</b>		<b>69</b>

Table14: Cultivation rate and surface cultivated for each market gardening crop

- **Market gardening production**

The project ended on the 30th April 2012. The last follow-up, which estimated market gardening production, took place mid-April (right before the KAP survey). At that time, harvest of some market gardening production had still not begun (for example onion, tomato, eggplant, beetroot). Some other products had begun to be harvested and were still harvested during follow-up (as okra, arugula, corcoris,...). In fact, only garlic was fully harvested (variation detailed in the graph below).

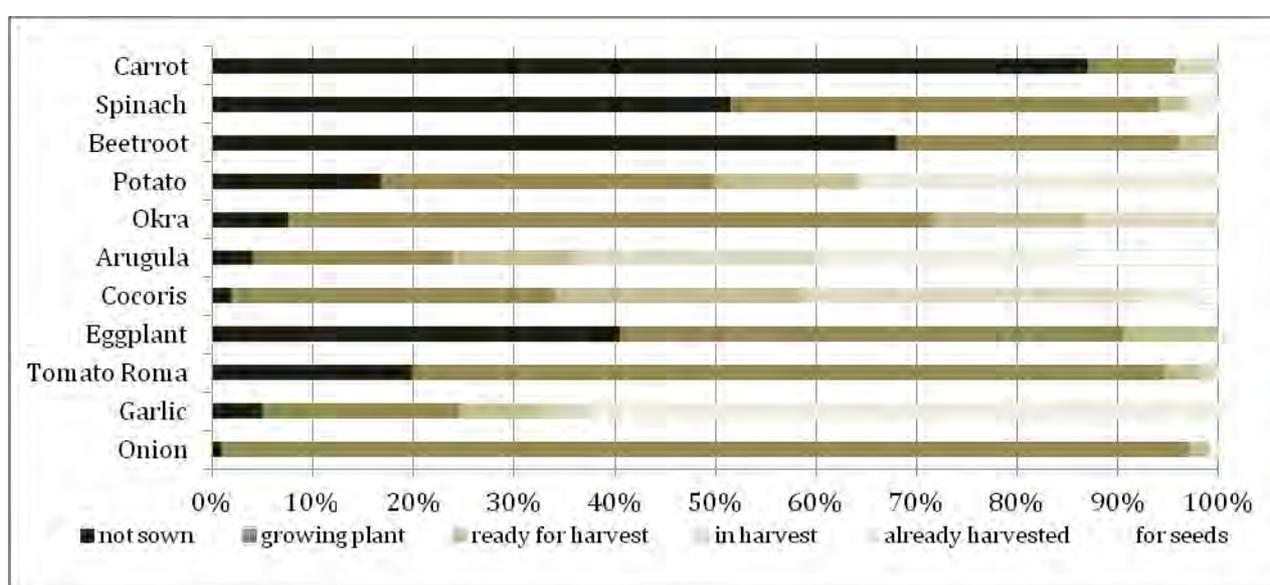


Figure 30: Bar chart of development state of each market gardening crop

Nevertheless, estimation of income generated by this activity could be done. Indeed, a farmer who took care of his market gardening plant could produce an equivalent of 26,000FCFA, which is around 2 months of self-sufficiency (for vulnerable type of households). The detail is developed in the table below.

Market gardening crop	Surface (number of bed of 1m <sup>2</sup> )	Income generated per bed (FCFA)	Income generated per type of crop (FCFA)
Onion	21	500	10,500
Garlic	12	900	10,800
Tomato Roma	5	no data	-
Eggplant	2	no data	-
<i>Cocoris</i>	5	400	2,000
Arugula	4	450	1,800

Okra	12	no data	-
Potato	2	650	1,300
Beetroot	2	no data	-
Spinach	2	no data	-
Carrot	2	no data	-
<b>Total</b>			<b>26,400</b>

Table 15: Estimated income generating thanks to market gardening

According to farmers' estimations, total production of market gardening vegetable may have reached an income assuring around 5 months of self-sufficiency.

#### 2.2.1.4 - Capacity building and training through community relays

##### A. METHODOLOGY

###### o Training creation

Each single training had been designed by the PU-AMI agronomy team. The frame of such training has been outlined by the team. Terms of references are developed for each training topic. This frame set a training goal and precise objectives. It was also the baseline for animation evaluation.

Each training was designed during a discussion group between 3 to 7 monitors. Then the training was presented to the all team, debated and redesigned. At the same time, a training booklet was designed. This booklet enhanced the key information of the training. It was only made with pictures to be understandable and used by everyone and also to be used as a teaching support.

###### o Community relay intermediary

For both food crop and market gardening trainings, one community relay was identified per village.

The 1,300 food crop beneficiaries received technical support from 42 community relays. Each relay followed a group of about 30 persons. The 980 beneficiaries of market gardening seeds kits were already gathered around joint nursery. Each group of 20 beneficiaries chose a relay to facilitate the technical training and follow up of the market gardening productions.

## B. PLUVIAL FOOD CROP

42 community relays have been identified and followed-up during the agricultural campaign. Each community relay has an assistant in case of absence during follow-up or training period. Periodic meetings between community relays and PU-AMI staff made the exchange of knowledge about any agricultural issue easier, and allowed quick answering to their needs in training.

- **Training during the agricultural campaign 2011-2012**

Due to a late start of the project in relation to the agricultural season (i.e. June 2011), agricultural training on soil preparation and sowing techniques were inappropriate. Nevertheless, according to the KAP survey results, those trainings were necessary for most farmers, so there were led in April 2012 for the agricultural campaign 2012-2013. However, the following trainings were given during the rainy season 2011.

### ***Fight against destructive plagues***

According to their needs mentioned during a periodic meeting in August, the community relays had been trained on bio-pesticide production with local inputs (neem, hot pepper, ashes, soap or tobacco), choice and use of chemical pesticide and their risks and, finally, on the best way to pulverize their fields, in early September.

In parallel with this training, small sprayers were distributed to each relay (one per person) to pay them back for the time they spent in follow-up and training.

### ***Square yields settlement***

In October 2011, the community relays were also trained to manage square yields. This training included some tips to calculate the yield and analyze the data collected.

### ***Conservation and storage systems for agriculture productions***

At the end of harvest, in December, PU-AMI staff drove trainings on good practice of food conservation and storage in mid-January for cereals, groundnuts and local beans. These conservation techniques include storage in granaries, individual storage, use of local treatment (as Neem: *Azadirachta indica*) to limit losses, food stock management and simple drying techniques.

- **Training for the agricultural campaign 2012-2013**

According to the results of the initial KAP survey, a lack of knowledge about some agricultural aspect needed to be taken in charge.

Trainings dealing with plot preparation, fertilization techniques, sowing methods, crops upkeep and production of bio-pesticide with local inputs have been realized. A booklet summarizing those aspects in images has been printed and distributed to each community volunteer.

### C. INITIAL AND FINAL KAP SURVEY

A KAP survey among IDPs and host communities was led to obtain precise data on agriculture practices and consequent training needs.

Done at the same time as the nutrition one, the food security KAP survey targeted 4% of the population of the 42 villages of Barde canton. The sample was identified as relevant by villages' leaders.

	Total of villages	Total of Households in targeted villages of South Bardé	Number of households interviewed
Initial KAP survey	42	6258	229
Final KAP survey	42	5364	144

Table 16: Sample interviewed for initial and final KAP survey

For this survey, it was mostly the head of the family who was interviewed.

Thanks to several meetings and KAP survey results, training sessions according to population needs were given, especially on pest treatments. The impact of these trainings was measured thanks to the comparison between initial and final KAP survey. Nevertheless, a KAP survey is supposed to measure practices, which could not be fully

observed due to the duration of the project (ended before the new rainy season). Those KAP could only evaluate the penetration of knowledge of the new agriculture good practices and certainly not the attitude towards such practices, and even less the implementation of those practices on the fields.

We can get some conclusions from the final KAP survey as detailed below:

- **Soil preparation**

At the beginning, 35% of the farmers did not know the reason to what they did to their soil. At the end of the project, 57% declared preparing their soil with the most suitable technique for their soil type. Thanks to that change, 87% of them who initially did the same thing to whatever type of soil they had, might change their practices according to their soil type (and stop ploughing their sandy fields for example).

- **Fertilization**

Originally 74% of the farmers waited to have bad yield to fertilize their soil and the only practice they did at that time was a rotation with groundnuts or carry animal dejection. At the final KAP survey time, still around 70% of them do the same. Nevertheless, other fertilization practices (such as carry of organic matter, crop association with leguminous plant, fallow,...) are now known by those farmers.

- **Pest treatments**

Pests are the main cause of yield losses. 80% of the farmers did not take preventive measures and 62% of them did not do anything in case of pest. After several trainings on pest treatments, none of the interviewed farmers seem to change their practices. That can be explained by the fact that treating one field is worthless if the surrounding fields are not, especially when fighting against destructive elements such as locust.

The fact that today 36% of farmers now know how to fight against pests should be noted. Indeed initially this knowledge was inexistent in the population.

- **Storage**

Primarily 70% of households did not do any preparation before storage. On the 2011 harvest, around 56% of the interviewed people had made a carefully prepared the crop (drying it, careful shelling it or packing it into treated bags) before the storage. 46% of them also treated their crop before storage. Most of them use local chemical insecticide (“Rambo”) and other with a preparation from local products such as neem (17%), ashes (8%) or hot pepper (8%).

#### **D. MARKET GARDENING**

PU-AMI trained the 49 leaders of the farmer’s cooperative as local focal points on cultivation techniques who follow-up and train other beneficiaries.

- **Bringing market gardening seeds under cultivation**

This first training began in mid-January, on how to bring market gardening seeds under cultivation. This training was mostly focused on sowing and transplanting plants with a spotlight on the new market gardening species implemented (eggplant, carrot, spinach, and beetroot). But it also dealt with soil preparation, irrigation system and weight of watering. Before this training a sensitization on those practices had been led during the seeds kits distribution (end of November).



Figure 31: Photo of market gardening training in Bourtail (February 2012)

- **Monitoring of market gardening**

The second training dealing with market gardening parcels upkeep (watering, weeding, staking, earthing up, pruning ...) and production of bio-pesticide with local inputs, took place in early February.

In parallel with this training, small sprayers were distributed to each beneficiary (one per person) to motivate them to do preventive treatment against pests and avoid curative plans.

- **Market gardening seeds production**

Since the availability of market-gardening seeds remains low in quantity and quality on the local market, and in order to ensure sustainability of seeds supply, all community relays have been trained on market-gardening seeds multiplication techniques. This capacity building will improve seeds availability on the market and create an income generation activity for the multipliers. This training took place between the end of February and early March.

- **Market gardening products conservation**

Training on market gardening products conservation throughout simple techniques of transformation, as drying and cooking, were led in early April to enlarge the consumption of vegetable during the year. Cooking demonstration, focused on new market gardening species implemented (eggplant, carrot, spinach, beetroot), was also given.

At the same time, traditional dryers were distributed to encourage community volunteers to change their drying techniques and stop spreading vegetables directly on the floor to dry them. These dryers were a compensation for the work done by the community relay for follow-up and training spreading.



Figure 32: Photo of "pélé-pélé" distribution to community relays (Matourouda, April 2012)

### 2.2.1.5 - Market Gardening parcels fence

Fences are necessary to avoid animal grazing on agricultural parcels. Traditional fences were built in the past with millet stalks and wood. To put traditional fencing in place, farmer's needed some tools and therefore wheelbarrows, mattocks, spades and rakes were given to each group. These tools were given through contract of good nursery care by the group.

Nature of item	Item	Quantity	Unit
Tools	Wheelbarrow	1	Unit
	Mattock	2	Unit
	Spade	2	Unit
	Rake	2	Unit

Table 17: Distributed tools to nursery groups

We have to note that quickset hedges could represent a good alternative, letting more sustainable the parcels fences, even if it is virtually impossible to find young plants of acacia on the market, making it necessary to establish tree nurseries.

### **2.2.1.6 - Conservation and storage systems for agriculture productions**

Harvest ended in December, and PU-AMI staff gave trainings on good practice for food conservation and storage in mid-January for cereals, groundnuts and local beans. These conservation techniques include storage in granaries, individual storage or use of local treatment (as Neem: *Azadirachta indica*) to limit losses, food stock management and simple drying techniques.

Training sessions on market gardening products conservation throughout simple techniques of transformation, as drying and cooking, were also led in early April to enlarge the consumption of vegetable during the year.



Figure 33: Photo of culinary demonstration of market gardening products cooking (Goundiang, April 2012)

## **2.2.2 Sub-sector 2: Livestock**

### **2.2.2.1 - Beneficiaries' identification**

This activity targets vulnerable breeders organized in groups. The existing groups, composed of really vulnerable and less vulnerable breeders, are targeted in priority.

The selection criteria of groups for fodder seeds distribution are as follow:

- Breeders group with a maximum number of households having an annual income below 250,000FCFA with a lack of complementary income;
- Groups having an access to cultivable lands for fodder cultures;

- Households practicing breeding as main activity;
- Households without fodder seeds stock;
- Households having a limited access to cultivable lands for market gardening cultures;
- Groups with community projects;

79 groups of breeders fit into those criteria. These breeder groups included around 20 breeders each, which means a total of 1,414 breeders. The breeders have individual livestock, in average 20 heads per breeder (with huge diversity between breeders, from 4 to 100), mostly sheeps and goats and some cows. The 1,414 breeders conjointly own 24,631 animals according to our census.

#### **2.2.2.2 - Purchase of fodder seeds**

The fodder seeds distribution allows minimizing the difficulties linked to lean season. Fodder is an alternative source of feeding to nutritional complements based on groundnuts, whose accessibility remains difficult during the lean season for the most vulnerable breeders.

PU-AMI selected cowpeas, pigeon pea and alfalfa to be distributed for their high rate of proteins.

PU-AMI has selected cowpea and pigeon pea for their tolerance to drought and high temperatures. Moreover these varieties are available locally and are traditionally cultivated in the area.

Alfalfa is a perennial fodder with high yield that enables at least two harvests per year. Both varieties are legumes and contribute to improve soil fertility. This factor is important in an area where access to the input is not easy.

Germination tests have been led by PU-AMI's employees to allow us to choose the best local supplier for such seeds.

An information phase preceded each distribution, where seeds characteristics were introduced to farmers-breeders. Agriculture training on how to prepare a fodder seeds plot has also been led at the same time. In order to improve the success of these cultures, PU-

AMI agents verified the plot choice and soil preparation before the fodder seeds distribution.

### 2.2.2.3 - Distribution of fodder seeds and natron stones

#### FODDER SEEDS

79 breeders' groups received fodder seeds and tools. Each group owned a plot of 0.15ha on average for a cumulated surface area between 10 and 12ha.

Nature of item	Item	Quantity	Unit	Sowing surface area	Unit
Fodder seeds	Cowpea	240	Kg	6	ha
	Alfalfa	24	Kg	6	ha
	Pigeon pea	38	Kg	4	ha
Tools	Sickle	237	Unit	-	-
	Hoe tourie	79	Unit	-	-
	Sprayer	79	Unit	-	-
	Rake	158	Unit	-	-
	Mattock	79	Unit	-	-

Table 18: Distributed fodder seeds kits and tools to breeders' groups

The seeds have been distributed in early February, during the lean season, right after the soil preparation trainings.

The monitoring of this distribution has been implemented by PU-AMI agronomy monitors in close cooperation with usual veterinary monitors in the field. Farmer-breeders have been monitored in the sowing, growing and have been followed-up until the end of the project. Harvest had not begun before the end of the project so no data is available on fodder cuts quantity or yields. Nevertheless follow-up data is available and significant.

If fodder fields of alfalfa and cowpea have given good results in around 80% of the fields (20% loss due to straying), only 4% of pigeon pea fields grew normally (mostly due to a lack of watering and because of the late germination of this type of seeds).

## NATRON STONES

Natron stone is also an efficient complement, providing mineral salts and trace elements. It is hardly locally found and surely not accessible for the most vulnerable breeders. So rather than distributing one stone to each breeder, trainings on how to make natron stone with locally market products (salt, cement, bran, bones powder), were led in early April. During the training, each present beneficiary could produce its own stone.

Remaining products needed for natron stone production were given to veterinary pharmacies as endowment

### **2.2.2.4 - Trainings on the use of fodder seeds and natron stones**

The management of produced fodder could be optimized by a better harvest and conservation. Training sessions, focused on the following, have been implemented:

- Cultivation of fodder culture (soil preparation, sowing, weeding, follow-up, fertilization, use of pest treatment done with local inputs);
- Support, structuring, viability and organization of agro-breeders groups;
- Techniques of reaping, conservation and storage of green fodder;
- Composition and constitution of complementary feeding with fodder.

Training on preparation and use of natron stone also took place in early April.

## ***2.2.3 Sub-sector 3: Veterinary medicines and vaccines***

### **2.2.3.1 - Cattle vaccination campaign**

#### **A. VACCINATION**

With the aim to improve sanitary conditions of the livestock following the 2010 crisis, a vaccination campaign was done in July 2011, in partnership with the Livestock Delegation. All cattle heads brought by the breeders were vaccinated.

The vaccination is subsidized but not fully free of charge, in order to avoid a negative dynamic and enable the public veterinary service to progressively take in charge the

campaigns as they did before the crisis. This strategy has been decided at the regional level and is progressively being implemented by NGOs. The financial participation of the breeders represented 25% of the real cost (25Fcfa for goats and sheep, 50Fcfa for horses and donkeys, 75Fcfa for cows and camels). The participation of the breeder will become more and more important each year to reach a level enabling a full cost recovery for governmental services.

A total of 18,088 heads have been vaccinated (i.e. 40%), a quantity lower than the one planned and due mainly to a lack of sensitization. Indeed, the breeders tend to criticize the practice of charging the vaccinations (first time in the area) even if it is still highly subsidized. The sensitization on how important the vaccination is for the safety of cattle suffered from a late approval of the contract (June 2011). This lack of sensitization had important effects: there was no vaccination campaign in 2010, and luckily only few cattle losses (especially compared to 2009), so breeders do not fully understand the importance of this practice. Moreover, some breeders accuse vaccination to cause cattle diseases or abortion. Even with the involvement of authorities and cattle auxiliaries, the number of breeders who took their cattle to the vaccination site did not increase significantly.

Furthermore, some breeders, to reduce the lean season for their cattle, went to the south, so they were not in Barde Canton during the first part of the campaign.

Nevertheless, an agreement has been settled with the livestock delegation, so the remaining vaccines given to them must be used in the area of the program.



Figure 34: Photo of cattle vaccination during the campaign in Kechmer (July, 2011)

## B. TREATMENTS

If the results of the vaccination part were a bit disappointing, the treatment part worked quite well. Indeed, it was really appreciated by breeders. Even if it was not free of charge, nearly 1,000 animals had been treated. Most of them (80%) suffered from different types of parasitosis, which cause weight loss due to diarrhea and loss of appetite, until death. Horses were treated in priority by breeders because those animals are useful, expensive and somehow fragile. There were mostly treated for parasitosis, injury and osteoarthritis.

## C. CAMPAIGN RESULTS

Just after the vaccination campaign, a survey was lead to evaluate the impact of this campaign and to estimate more precisely the number of animals in the area. The census of cattle underlines that today there are less than 92,000 heads in the area. Considering the fact that many important breeders are migrants, the initial target of 127,000 heads treated (45,000 vaccinated) seems to have been overestimated.

Species	Cattle	Sheep	Goat	Horse	Donkey	Camel	Total
Census heads	17,319	38,840	25,210	2,297	7,628	0	<b>91,289</b>
Number of vaccinated heads	3,508	8,350	4,299	1,307	509	115	<b>18,088</b>
% of vaccinated heads compared to census one	20%	21%	17%	57%	7%	-	<b>20%</b>
Number of treated heads	215	360	43	198	90	42	<b>948</b>
% of treated heads compared to census one	1,2%	0,9%	0,2%	8,6%	1,2%	-	<b>1%</b>

**Table 19: Vaccination campaign results compared to cattle census**

For the survey, 200 breeders of the 42 villages of the area were interviewed. Only 41% of them vaccinated their animals during the vaccination campaign. Different explanations were mentioned to justify this decision:

- 48% were not well informed due to the lack of sensitization – caused mainly by the low involvement of the charismatic leaders to relay it
- 42% were not present in the area during the campaign

- 9% avoid vaccination, which might cause cattle diseases or abortion without suppressing cattle mortality.

Among the breeders who had actually vaccinated their cattle this year, 71% consider that their cattle are in best shape than ever. 20% say they did not notice any change. 5% had some animals which were ill after vaccination, and 2% presented severe diseases which caused abortion (1 head) or death (1 head).

The great success of the campaign was the treatments: 98% of the breeders who use it notice a remarkable improvement of their cattle condition.

According to the interviewed breeders, if another subsidized vaccination campaign takes place, 94% of them will vaccinate their cattle if they are in the area.

#### **2.2.3.2 - Cattle auxiliaries' follow-up and capacity building**

Improvement of cattle sanitary condition is also based on reinforcement of cattle auxiliaries. For this purpose 19 auxiliaries trained were followed-up by the 3 veterinary monitors of PU-AMI team.

The reinforcement of cattle auxiliaries started in mid-February when the cattle auxiliaries had more time to spend in training, following the period of harvest and storage. This training course was held in partnership with the Livestock Delegation according to the agreement established in December.

This course should reinforce the abilities of auxiliaries on the following topics:

- Veterinary techniques: diagnose improvement, individual follow-up of breeders, level 2 training, training on specific topics;
- Advocacy towards beneficiaries on different topics: vaccinations, hygiene (on water point for example), issue of sanitary meet on market, fodder good practices, fodder nutritional rations elaboration...
- Cashbox Management: cashbook management, supply and stock monitoring and management...

Each day, the content of the training was adjusted to answer auxiliaries' needs and fill their lack of knowledge.

This training ensured workshops on specific issues and experience sharing between the whole team of auxiliaries, PU-AMI's veterinary monitors and Livestock Delegation training officers.



Figure 35: Photo of veterinary demonstration during the training in Arkoum (March 2012)

At the end of the project, 20,911 heads (i.e. 16.5% of the total number of heads) had been vaccinated or treated by auxiliaries. This low number can mostly be explained by the overestimated census at the beginning. Moreover the follow up of auxiliaries by PU-AMI veterinary monitors had only begun in September, while the 3 veterinary pharmacies were not functional, so auxiliaries did not have an easy access to drugs at that time. The fact that pharmacies reach only smooth functioning in March (due to a long process caused by Chadian law regulation on veterinary pharmacy), had a great impact on the results.

	Cattle	Sheep	Goat	Horse	Donkey	Camel	Total
Census heads	17,319	38,840	25,210	2,297	7,628	0	<b>91,294</b>
Number of heads treated or vaccinated	4,048	9,358	4,837	1,753	718	197	<b>20,911</b>
% of treated or vaccinated heads compared to census one	23%	24%	19%	76%	9%	-	<b>23%</b>

Table 20: Veterinary interventions results compared to cattle census

### 2.2.3.3 - Setting up of veterinary Pharmacies

#### A. EVALUATION

During the vaccination campaign evaluation survey, 89% of breeders interviewed agreed to pay more for higher quality cattle medicines, making them potential future clients for the veterinary pharmacies.

PU-AMI began with an evaluation of the existing Arkoum veterinary pharmacy in order to understand the existing weaknesses of the organisation.

#### B. SPECIFICATION OF A NEW PHARMACY ORGANIZATION

##### o **Organization committee**

Right after the evaluation, a focus group was held with all the auxiliaries, breeders and local authorities of the area in order to discuss their perspectives on local veterinary pharmacies, to expose the main weakness of the former pharmacy and to suggest solutions to these problems. The table below shows the primary problems identified and the solutions proposed by focus group participants.

Problems	Solutions
<ul style="list-style-type: none"> <li>- No implication from breeders</li> <li>- Products too expensive</li> <li>- No real interest from breeders</li> <li>- Lack of control (risks of misappropriation)</li> <li>- Management and accountancy weakness</li> <li>- Difficulty to find someone to buy the products in Abéché</li> <li>- Lack of visibility</li> <li>- Few persons during the meeting</li> </ul>	<ul style="list-style-type: none"> <li>- Integration of breeders in the committee</li> <li>- Global commands from the 3 pharmacies</li> <li>- Awareness raising sessions</li> <li>- Control committee+ constant monitoring of the cash box + inventory</li> <li>- Training from PU-AMI on management and accountancy</li> <li>- Creation of a buyer position</li> <li>- Sign for each pharmacy</li> <li>- Assistant for each crucial position + application of the internal rules</li> </ul>

Table 21: Identified problems and solutions proposed during the discussion group work

As a relief to most of the weaknesses, a new structure for the Pharmacy Management Committees emerged from this process, as shown below.

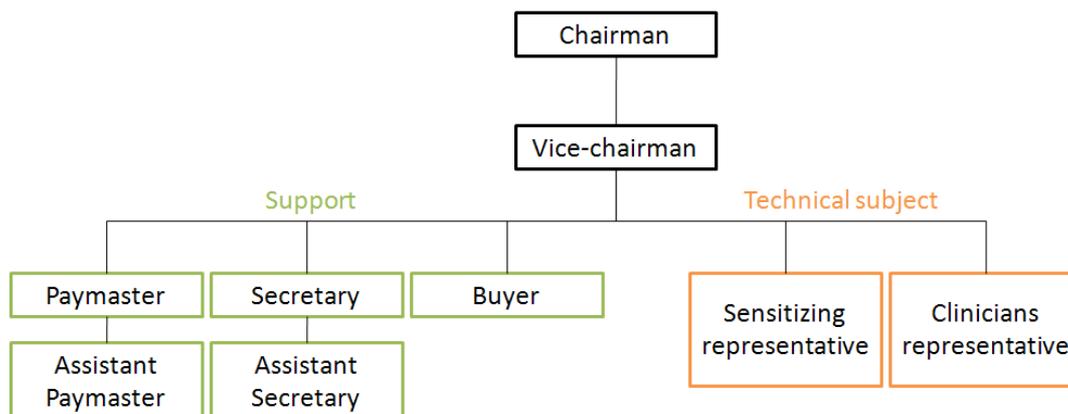


Table 22: Organization chart of the new pharmacy committee

This new organization chart was adopted during a second general meeting in which it was decided that a general committee grouping chairman and paymaster of the three management committee would be established. Specifications of the positions were also defined.

The new committees were formed during separated meetings in the three areas of intervention, allowing the election of one Committee Chairman to act as the focal point for communications with PU-AMI.

- **Statutes and rules of procedure**

The establishment of veterinary pharmacies is highly regulated by Chadian law. The statutes and procedures have to be approved by the permanent ministerial representative of the Canton (to have the authorization to exist), and by the livestock minister representative (to have the authorization to purchase pharmaceutical products).

PU-AMI staff worked with the communities and committees, breeders and authorities in order to define the main guidelines of statutes rules of procedure of the management committees.

Following those various discussions with committees PU-AMI drafted a proposal of statutes and procedures, which was twice submitted to the committees for amendments, and from which a final version has been voted.

After the adoption by the committees, the Livestock Delegation and the permanent ministerial representative of the Canton approved them in mid-January.

- **Drugstore building**

According to the committee of the previous pharmacy, the lack of visibility, retail outlet, storage shop and committee meeting place was a huge weakness. All those problems could be easily solved by the construction of a small drugstore.

Advocacy was done towards local authorities to give a plot for each pharmacy committee to build a store near the market place. Donation certificate were signed by the authorities to attest that the plot is now a property of the pharmacy association.

So, in parallel of the drafting, breeders and cattle auxiliaries built common storage places thanks to their own inputs (brick, gravel, sand, clay, part of cement, water and labour) and PU-AMI expertise (building supervisor) and help for some building material (part of cement, metal sheet, timber and metal door). All the shelves were brought by the committees and members of veterinary pharmacy association.

- **Capacity building**

PU-AMI staff was focused on training committee members. General trainings were led in management techniques, way of taking inventory, managing a budget and accountancy book keeping.

Then, personal trainings were given according to each one's position. The buyer received training focused on inventory and stock management; the paymaster on portfolio management and budget administration; the secretary on accountancy book keeping and wording.

Each committee member had its own book keeping, worked out in closed cooperation with a PU-AMI monitor.

A final training on main management practices was led at the same time as medicine endowment.

- **Medicine endowment**

The veterinary products have been defined by the needs of auxiliaries from a combined point of view from the Livestock Delegation and pharmacy's committee.

The purchase process took a long time (over one month) due to the high volume of products needed and the few number of veterinary pharmacies registered within the Livestock Delegation. The total medicines distribution took place in mid-April. The distributed products are summed up below.

Nature of item	Item	Unit	Quantity	Pharmacy	Number of items
Medicines	Oxytétracycline 20%	bottle	50	3	150
	Oxytétracycline 10%	bottle	10	3	30
	Phénoxyzone	bottle	20	3	60
	Fercobsang	bottle	10	3	30
	Ivermectine	bottle	5	3	15
	Vermitant 2500mg	tablet	167	3	501
	Vétoantidiar	sachet	105	3	315
	Avitone	sachet	20	3	60
	Diminazene 23,6	sachet	10	3	30
	Diminazene 2,36	sachet	26	3	78
	Vétospray	bottle	2	3	6
	Bolumisol 1	box	2	3	6
	Bolumisol 3	box	2	3	6
Medical consumables for treatments	Intrafer	bottle	1	3	3
	Betadine	bottle	2	3	6
	Permanganate	sachet	20	3	60
	Compress 10x10	box	1	3	3
	Absorbent cotton wool	packet	1	3	3
Small medical	Rubber gloves	box	1	3	3
	Needle 18g	box	1	3	3

equipment	Needle 14g	box	1	3	3
	Syringe 20cc	piece	2	3	6
	Syringe 10cc	piece	2	3	6
	Cat gut	piece	10	3	30
	Bistoury blade	piece	3	3	9
	Bistoury	piece	1	3	3
	Pair of scissors	piece	1	3	3
	Haemostatic forceps	piece	1	3	3
				<b>Total of medicines</b>	<b>1290</b>
				<b>Total of consumables</b>	<b>75</b>
				<b>Total of small medical equipment</b>	<b>66</b>

# 1. PROJECT CONCLUSION

## **A first step towards malnutrition management:**

In terms of nutrition, this project aimed at setting up a malnutrition screening system, based on community participation. The 176 community volunteers trained in malnutrition detection are now able to help the health centers' workers to reach the malnourished children in the most inaccessible areas of both Bardé and Kado cantons.

The nutritional KAP and food security monitoring allowed PU-AMI to better understand the underlying causes of malnutrition, which can be summarized as follow:

- Climatic factors, as frequent droughts ;
- Lack of access to good quality water, as diarrheic diseases vector ;
- Lack of hygienic knowledge and practices, as another factor of diarrheic diseases ;
- Inappropriate nutritional practices, especially concerning young children and pregnant women.

By working in partnership with the health centers, PU-AMI could also better understand the main constraints that prevent the implementation of a strong malnutrition management.

These constraints are:

- Lack of material and financial resources ;
- Lack of human resources ;
- Lack of political investment in the intervention area.

Thanks to that experience, PU-AMI could develop a strategy to fight against malnutrition in the intervention area, using a community based approach. Several projects were written to develop programs to fight the prevalence of malnutrition, with the collaboration of Ministry of Health agents and community volunteers. These projects should begin in July 2012.

The KAP survey showed the importance of integrating hygienic consideration to fight malnutrition. For this reason, a “WASH in Nut” strategy will be implemented, consisting in supporting health centers with hygienic equipments (latrines, shower, hand-washing points), and the distribution of water treatment supplies to the households of malnourished children. A follow up in these households will be ensured to make sure the treated children live in the best possible conditions.

An agreement between PU-AMI and the Chadian Ministry of Health is currently in discussion to establish the modality of this partnership. Through material support, trainings, monitoring and evaluations, PU-AMI will bring a sustainable support to the health workers and community volunteers in order to fight malnutrition in Assoungaha, contributing to decrease children mortality and morbidity.

Community volunteers and Management Committees of the nutritional education centers built during this project will play a major role in the implementation of the program, by relaying key messages on nutritional and hygiene practices and detecting cases of malnourished children. The combined mills installed will also be followed in order to spread new nutritional practices, such as enriched gruel for children, in the community.

As a conclusion, we can say that this project was a first step that allowed PU-AMI to develop an integrated approach to fight against malnutrition, which will be one of the main activities of PU-AMI in Assoungaha in the next months.

### **A second step to fight against malnutrition by increasing food accessibility and availability**

In terms of agriculture, this project aimed at setting up a solid knowledge basis of agricultural good practices both for food crop and market gardening cultivation. These trainings were devoted to the making and use of treatment products made with local resources (such as *Azadirachta indica* seeds and hot pepper), and to appropriate storage techniques. 91 community relays had been trained and are now able to convey knowledge to everyone, which will help to sustain agriculture activities despite the difficulties known in the area.

Nevertheless, agricultural productions met with extremely low yields in food crop and limited available surface area for market gardening seeds. Those results due to 2011 drought may have disastrous consequences.

In order to fight against the food security crisis, large scale food distribution had to take place to bridge the gap of the most vulnerable households until new harvests.

Those food distributions had to be coupled with food crop seeds distributions because most of the households, as coping strategy, had already eaten their seeds. Both those distributions may allow farmers to cultivate (with enough energy) the 2012 agricultural campaign.

However, to avoid cattle straying, which may cause important loss, livestock management and fodders cultivation had to be developed even during rainy season to limit strenuousness work, increase fodder yields and enlarge its consumption.

### **A third step to improve global health in the area through veterinary support**

Even if the previous campaign results were disappointing, due to an over estimation of cattle census and a lack of time for sensitization; maintaining a sufficient level of cattle health is still a major issue. Indeed, assuring cattle vaccinations avoids large scale epidemics and transmission to men, so it both ensures public health and economic stability (cattle are a traditional way of saving).

A new vaccination campaign will be led at the beginning of 2012 rainy season.

**Annex 1 – Map of the intervention area**

