Food and nutrition status of households with homegardens in the Nuba Mountains, Sudan

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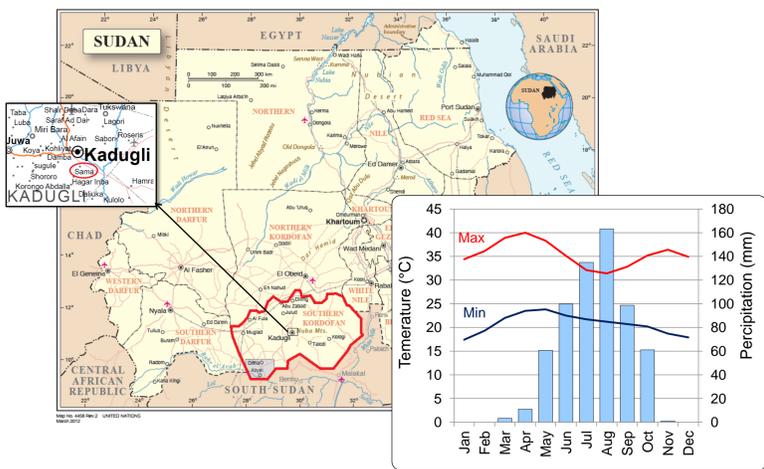
Background

Sudan is one of the last developed countries and many people particularly in South Kordofan (see map) suffer from food insecurity. Food production from homegardens and wild collection are seen as key elements in strategies to overcome nutrient deficiencies. Food intake 24h-recalls were conducted and food samples were taken in four households in Sama (see map), to evaluate the *status quo* and the contribution of homegardens and wild collection during three seasons (June, October and December).

Characterization of households

Management: traditional; commercial (selling >50% of their homegarden harvest and using chemical fertilizer)

Importance: In a questionnaire households were asked if the homegarden is important or not for them.

Characteristics of the 4 homegardens:

Commercial Important	Commercial Not-important
Traditional Important	Traditional Not-important

Picture: Harvest from homegarden

Nutritional status

Methods: 24h-recalls, calculation of nutrient intake with NutriSurvey[1] and other databases, comparison with recommended daily intake (DGE[2]), determination of dietary diversity scores.

Results: Severe deficiencies were found in energy and vitamin A and C, medium no deficiencies were found for iron, zinc and protein (Figure 1). Household consumed on average per day 8 food groups, this is more than reported in other studies conducted in Tanzania[3] and 16 different items which is more than needed for an adequate diet[4].
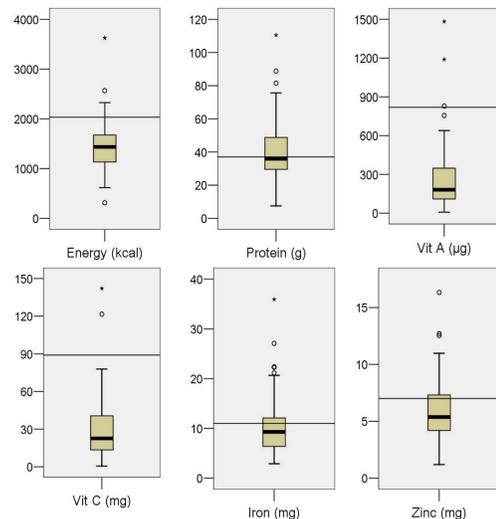
Figure 1:Daily nutrient intake per person (Boxplot) compared with the recommendation given by DGE (line)

Homegarden and wild collection

Methods: Within the 24h-recalls households were asked which items were taken from the homegarden or collected in the wild, items were counted and the share of nutrients coming from those items were calculated.

Results: Overall 12 items were used from homegarden and 7 collected form the wild (see list on the right). From homegarden households used mostly green-leafy vegetables (rich in vitamin A, iron and zinc) and fruits (rich in vitamin C) from the wild. The contribution to the nutrient intake was up to 7 % (Figure 2).

Items used from homegarden:
Amaranthus leaves, Corn, Cowpea, Cucumber, Jews mallow, Okra, Peanut, Pumpkin, Pumpkin leaves, Sorghum, Stylochaeton hypogeum, Tomato

Items collected in the wild:
Baobab, Christ´s thorn, Gum arabic, Mango, Marula, Purslane, Yellow
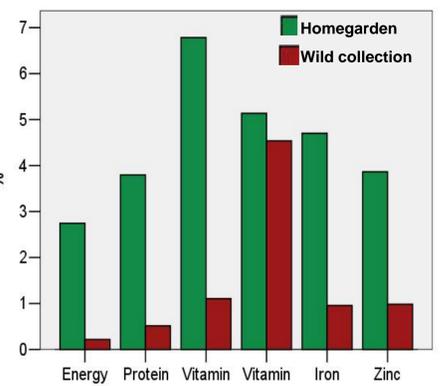
Figure 2: Share of nutrients of items from homegarden and wild to the whole nutrient intake

Management vs. importance

Methods: The difference in nutrient intake and dietary diversity between the two management type and between the two importance levels were calculated in percent and compared.

Results: Differences between traditional and commercial (market-oriented) homegardens were smaller (Figure 3). Households which considered homegarden to be important for their daily life had a better nutrient intake, but less diverse diet than those with a reduced importance of homegardens. Thus the perceived importance of the homegardens seemed to affect household nutrition more than the level of their commercialization.
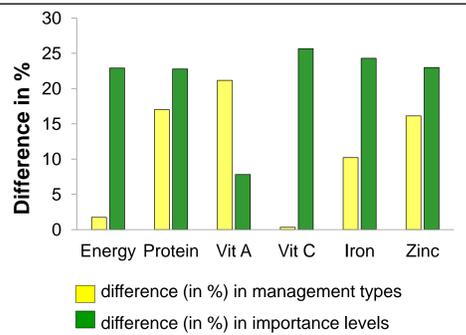
Figure 3: Comparison of differences in management types and importance levels

difference (in %) in management types
difference (in %) in importance levels

Pictures: Family and children in Sama

Analysis of food samples

Methods: Samples of prepared food were taken, energy (bomb caloriemeter), protein (DUMAS), iron and zinc (microwave pressure digestion and AAS) were analyzed in the laboratory.

Results: Values from the laboratory were higher than what was calculated from the recalls and databases (Figure 4), especially for foods with meat and fermented porridge.
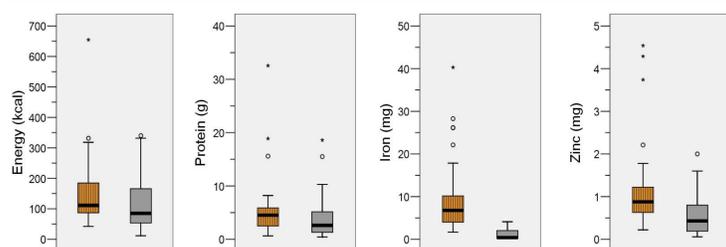
Figure 4: Mean content of nutrients in foods: left (orange) measured in the laboratory, right (grey) calculated with databases

Conclusions:

The results of the 24h- recalls indicate a malnutrition of the people in the research area. But the people does not look like suffering from hunger, also the results of the laboratory suggest that the foods are more nutritious than calculated by means of the recalls and databases. Homegardens supply households with green-leafy vegetables and thus contribute to the vitamin A intake, as well as iron and zinc. Wild collection increases the vitamin C intake and the fruits, here mostly Christ´s thorn (*Ziziphus spina-christi* (L.) Willd) are available even after the rainy period. The impact of gardens and wild collection is less affected by the management than by the importance level. Homegardens can play a crucial role in secure the food security, especially in the micronutrients of households. Homegardens should be promoted to strengthens their importance to the homegardens and thus their role in nutrition and income generation. Further research should focus on more reliable data for calculation of nutrient intake and for techniques for processing and preserving foods in a nutrient protecting way.

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