The Impact of Wild Plant Foods in reducing the minimum Cost of a Nutritious Diet in Turkana, Kenya using Linear Programming Modelling

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INTRODUCTION

In Turkana, Northern Kenya, insufficient access to nutritious diets is a major challenge[1]. Women of reproductive age facing this challenge transit into pregnancy and lactating periods malnourished which in turn affect their children as well[2]. Through modeling diets for different target groups (children: 6-8 months, 9-11 months and 12-23 months, and women (15-49years): non pregnant/non lactating, pregnant, and lactating), this study sought to achieve the following objectives:

- To assess the minimum cost of nutritious diets for the target groups.
- To identify the ability of wild plant foods to reduce the cost of diets and close the nutrient gap if any.
- To study the contribution of local foods to the cost as well as energy and nutrient content of the diets.
- To predict the ability of households to afford the least cost of diet.

METHODS

- Three pastoralists and three agro-pastoralist villages were randomly selected from a list, and market surveys were conducted in both plenty and lean seasons.
- Focus group discussions were held with ten women in each village, to determine the culturally accepted dietary habits, and information was verified with the 25th and 75th percentile of dietary intakes collected from 180 households using quantitative 24h dietary intake recalls in the same villages.
- Three wild vegetables and three wild fruits were selected from a list of wild plant foods for modelling (Figure 2).
- Data were entered in the Cost of Diet linear programming tool developed by “Save the Children”-UK to model a Locally Adapted Cost Optimized Nutritious (LACON) diet.
- Affordability was measured using the 2016 Household Economic Approach from “Save the Children”.

RESULTS- Diet cost

- Daily LACON diet without wild foods for children costs between $0.5-$1 and $0.6-$1.2 in the plenty and lean seasons respectively. For women, it costs between $1.7-$2.4 in the plenty season and $2.2-$2.9 in the lean season (Figure 1).
- Adding the 3 wild vegetables in the model, showed the highest cost reduction for all categories (women and children).
- For children, 12-23months, all combinations of wild foods, fruits or vegetables significantly reduced cost by 34%-66%.
- The single food *Solanum americanum* reduced diet cost for reproductive women, especially pregnant women up to 47%.

Figure 1: Diet cost and Percentage reduction by wild plant foods

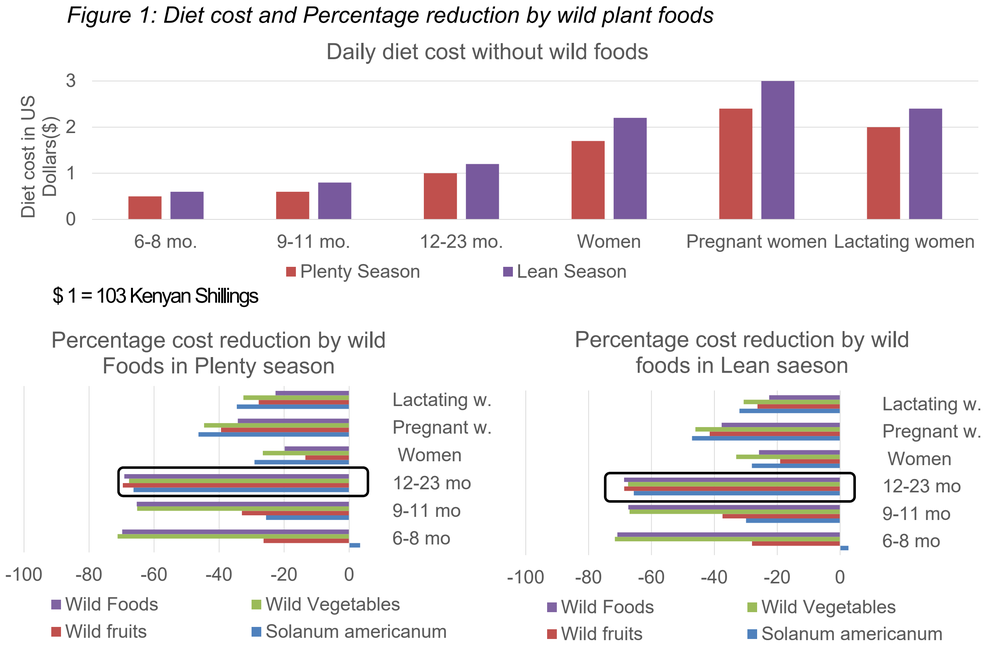


Figure 2: *Wild plant foods(Local names in parenthesis)*

Wild Vegetables

Amaranthus hybridus (Dodo)

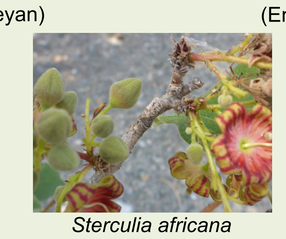
Solanum americanum (Suja)

Celosia argentea (Angelokothim)

Wild Fruits

Berchemia discolor (Emeyan)

Grewia tenax (Engomo)



Sterculia africana (Etete)

RESULTS- Nutrients

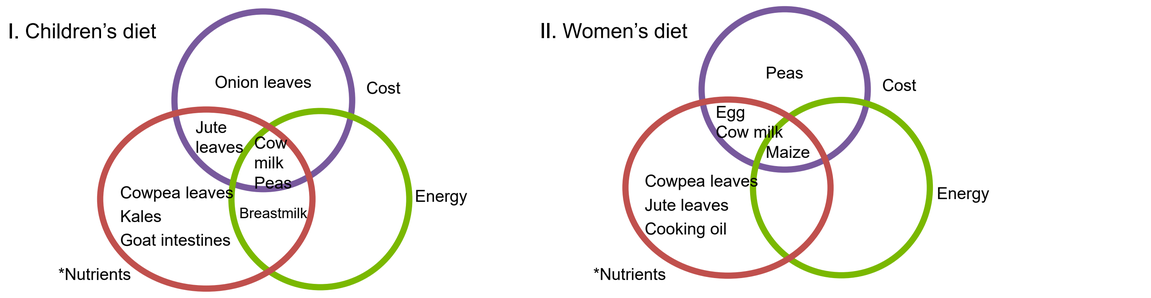
- Iron and zinc deficiencies were found in diets without wild foods for all groups except lactating women throughout the year.
- Diet modelled with wild vegetables or all wild foods were able to make up fully for the nutrient deficiencies(Figure 3).
- Single wild foods or all wild fruits alone were unable to fully fill the nutrient gaps

Figure 3: Nutrient percentage met without and with wild plant foods throughout the year

RESULTS- Cost, energy and nutrient contribution

- Cow milk and peas contribute most to diet cost for children, but also provide much energy and nutrients. Breastmilk, considered as “free”, provides high levels of energy and nutrients (Figure 4(I)).
- Maize was the single food contributing highly to cost, energy and nutrient content in women’s diet. Egg and cow milk contribute highly to diet cost and nutrients content (Figure 4(II))

Figure 4: Local foods highest contributions to Cost, Energy and Nutrient in modelled diets without wild foods.

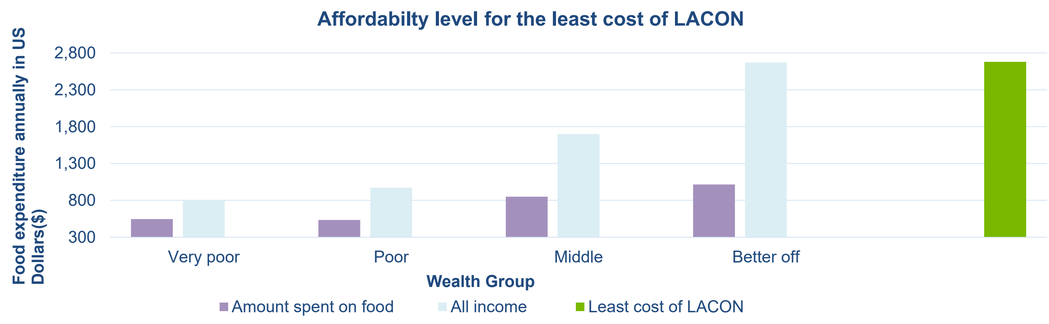


* refers to Protein, Fat, Folic acid, Ca, Fe, Mg, Zn, Vitamin A,B_1,B_2,B_3,B_6,B_{12},C

RESULTS-Affordability

- Diets modelled with wild vegetables provide the cheapest LACON diet of $2,660 annually for an average family of 9.
- Households irrespective of their wealth level are unable to afford the least cost LACON diet taking into account their food expenditure budget (figure 5).

Figure 5: Affordability level for the cheapest LACON diet



CONCLUSION

- Wild plant foods provide a huge potential of reducing diet costs as well as fulfilling nutrient requirements but their potential must be assessed on individual and location specific basis .
- Affordability of a nutritious diet in Turkana is still a big challenge (economic constraints) despite wild foods reducing the cost significantly when in season.
- Therefore, in addition, food subsidy on cow milk, maize and peas especially or cash transfer schemes can be introduced for households to be able to access a nutritious diet and meet daily nutrient requirements

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