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THE NEED FOR DIVERSITY – IN OUR DIETS AND ON FARM

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Recently there has been a renewed global call for diversity by motivated scientific communities, and concerned organizations, driven by health issues, climate change and development concerns. Diversity is not new. Didn't we all learn the food pyramid of a balanced diet in school? Agricultural science has long taught the value of on-farm diversity to improve soil health; to manage outbreaks of pests and diseases; and to avoid livelihood destruction in extreme climates.

Despite this, consumers are feeding on what is recognized as a 'globalized diet' - dairy products, cereals, refined cereals, refined sugars, refined vegetable oils, fatty meats, salt, and combinations of these foods.¹ FAO has noted that the **diversity of cultivated crops has declined 75% during the 20th century.**² A recent article in the Proceedings of the National Academy of Sciences of the USA notes that national food supplies worldwide have become more similar, reflected also by a global increase in supply of key cereals while there is a global decrease of other cereals and crops.³

This is depicted well in Table A that shows which crops have increased or decreased in their significance, using their calorie contribution relative to all the other crops. Dominant crops include wheat, rice and some oil crops. Crops which faced the biggest decline are sorghum, cassava and millets. Pulses are also in the group of declining crops.

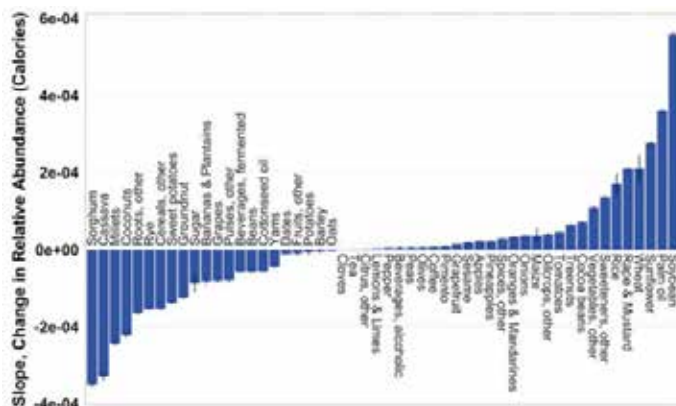


Table A Change in relative contribution of crops to our diet (in regards to calorie intake).
(Proceedings of the National Academy of Sciences USA³)
Increasing homogeneity in global food supplies and the implications for food security)

The report also points out that although the number of crops available to consumers in a country has generally increased, these are of minor significance. **At the global level there is, instead, a narrowing of the diversity of crops that play a major role in our diets.** One reason for this trend is globalization and preference for Western diets.

One downside of this preference for Western diets is a rise in the incidence of diabetes, heart diseases and obesity. The American Journal of Clinical Nutrition¹ reports that **in most Western countries, diet-related chronic diseases represent the single largest cause of morbidity and mortality.** There is evidence showing that these diseases are not due to one element of the diet, e.g. high saturated fats, but from the entire diet, along with genetic susceptibility and environmental factors. This prompts us to seriously reconsider our diet preferences tending towards homogeneity. After all the word diet is derived from the Greek word *díaita* which meant way of living.

Could the answer be to move back to some traditional diets? We know that legumes are high in protein and rich in calcium, iron and zinc, folate and provitamin A.⁴ Nutri-cereals like millets are highly digestible, gluten free, have a low glycemic index, high in antioxidants and micro nutrients, with, for example, pearl millet having the highest iron and zinc of any cereal grain.⁵



Photo Credit: L. Vidyasagar, ICRISAT

Scientists inspecting new varieties of Pearl Millet at the experiment station at the headquarters of the International Crops Research Institute for the Semi-Arid Tropics in India. Millets are a nutri-cereal high in micronutrients and naturally drought tolerant that may save many farmers in the harsh drylands being further impacted by climate change.

To reverse this dangerous trend of a narrow and over-processed diet it is necessary to promote diet diversity and change the image of lesser known crops. Legumes are commonly seen as the poor person's protein. A recent survey undertaken in Malawi, by the International Potato Centre, identified that a third of the respondents would eat less sweet potato if they became richer. This indicated that sweet potato was associated with being poor and changing perceptions was an important part of crop development.⁶



Photo Credit: S. Sridharan, ICRISAT

Dr Said Salim, former ICRISAT Regional Director for East and Southern Africa providing advice on how to harvest pigeonpeas to a farmer in Malawi. Legumes like pigeonpea are high in protein so when combined with cereals like millet, provide a balanced mix of nutrients.

On my recent trip to Mali and Niger, very strong traditional millet eating countries, I was surprised that millet was never on the menu or served. Each person I asked, independently answered, "Oh that's what they eat in the villages." An international NGO I met there was providing mid-day meals for children at school and wanted to use millet because of its high nutritional value and is a traditional crop that grows well in the area. But the children and parents argued against millet being served as they wanted the more popular rice meal - a trend which was already strong in the city and now being emulated in the villages. The NGO was in a difficult situation as they did not want the meal they provided to be the least nutritious meal of the day.

The 'image' of crops runs deep even among farmers. It is a status symbol among some farmers to be growing what is considered to be a modern crop like maize, rather than a traditional crop like millet.

Quinoa has made the leap from a village crop to the latest 'must have food' due to a new wave of global attention to its nutritional value making it modern and trendy. This raises the danger that the traditional farmers in poor countries are selling quinoa that they once ate and using the extra income for less healthy foods. Rising popularity has also meant higher quinoa prices making it unaffordable for the poor.⁷

An FAO reports points out that small-scale farmers produce

over 70% of the world's food.⁸ **We will not have enough food to feed the growing world population if we do not care about these smallholder farmers - their wellbeing, health, fair share in the value chain developments and sustainable livelihoods.**

For sustainable solutions we need to:

- Build awareness of the value of eating more diverse and nutritious foods;
- Change the image of highly nutritious traditional foods to being a more modern food;
- Revive and invest more in the research and development of nutri-cereals, legumes and root crops, that in comparison to other major crops, have been left behind;
- Channel more efforts and support into developing the whole value chain from farming to new products and market development of these 'revived' crops;
- Ensure that smallholder farmers in developing countries are partners and benefit from these efforts; and
- Understand more about the nutritional aspects including bioavailability of the nutrients of these crops, and factors affecting this.

The necessary shift to a more diversified diet and agricultural system will not happen through niche marketing. Niche marketing will only continue the trend of more diversity within countries but will not change the stronger dominance of the major crops globally. It will happen only by changing mindsets of consumers as well as the industry. **For the sake of the health of our future children and the planet, we need a revolutionary change in our diets – a switch to 'Smart Foods' that are good for you and good for the planet.**

¹ Loren Cordain, S Boyd Eaton, Anthony Sebastian, Neil Mann, Staffan Lindeberg, Bruce A Watkins, James H O'Keefe, and Janette Brand-Miller, 2005, *Origins and evolution of the Western diet: health implications for the 21st century*, *The American Journal of Clinical Nutrition*, February 2005 vol. 81 no. 2, pp 341-354. <http://ajcn.nutrition.org/content/81/2/341.full>

² Mark Kinver (Environmental Reporter), 2014, *Crop diversity decline 'threatens food security'*, *BBC News*, 3 March 2014. <http://www.bbc.com/news/science-environment-26382067>

³ Colin K. Khoury, Anne D. Bjorkman, Hannes Dempewolf, Julian Ramirez-Villegas, Luigi Guarino, Andy Jarvis, Loren H. Rieseberg and Paul C. Struik, *Increasing homogeneity in global food supplies and the implications for food security*, *Proceeding of the National Academy of Sciences of the USA*, 3 March 2014, doi: 10.1073/pnas.1313490111. <http://www.pnas.org/content/early/2014/02/26/1313490111.full.pdf+html>

⁴ International Crops Research Institute for the Semi-Arid Tropics, 2013, *Grain Legumes: Chickpea, groundnut and pigeonpea: From subsistence to international trade*, website. http://exploreit.icrisat.org/page/grain_legumes/684

⁵ International Crops Research Institute for the Semi-Arid Tropics, 2013, *Dryland Cereals: New techniques and strategies for dryland cereals*, website. http://exploreit.icrisat.org/page/dryland_cereals/679

⁶ K. Sindi, C. Kiria, J. Low, O. Sopo, and P.E. Abidin, 2013, *Rooting out hunger in Malawi with nutritious orange-fleshed sweetpotato: A baseline survey report*, Blantyre, Malawi, International Potato Center (CIP). <http://cipotato.org/wp-content/uploads/2013/08/006116.pdf>

⁷ Dan Collins, 2013, *Quinoa brings riches to the Andes - Bolivian and Peruvian farmers sell entire crop to meet rising western demand, sparking fears of malnutrition*, *The Guardian*, 14 January 2013. <http://www.theguardian.com/world/2013/jan/14/quinoa-andes-bolivia-peru-crop>

⁸ Karla D. Maass Wolfenson, 2013, *Coping with the food and agriculture challenge: smallholders' agenda - Preparations and outcomes of the 2012 United Nations Conference on Sustainable Development (Rio+20)*, Food and Agriculture Organization of the United Nations, Rome, April 2013, revised July 2013. http://www.fao.org/fileadmin/templates/nr/sustainability_pathways/docs/Coping_with_food_and_agriculture_challenge_Smallholder_s_agenda_Final.pdf