

## More Pulses Please! *Micro-nourishment with mega benefits*

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Four-year old Kakuli from a village in Nadia district in West Bengal, India, typically eats rice with a bowl of lentil for mid-day meal. While rice provides calories, lentil is the main source of protein and essential minerals for many growing children in this part of the world. The bowl of lentil though has been diminishing over the past 20 years – a worrisome trend.

In India, 43 percent of children under five are underweight and almost half have stunted growth.<sup>i</sup> Anemia or deficiency of iron afflicts 69 percent of preschool children and over 55 percent of women,<sup>ii</sup> which negatively affects pregnancy outcome and physical and cognitive development.

Micro-nutrients, like iron, zinc, and vitamin A, although required in small quantities, are responsible for vital functions of the human body. Yet more than two billion people worldwide suffer from micro-nutrient deficiency – a condition that goes unnoticed even in the affluent countries. Commonly known as “hidden hunger”, their deficiency causes low birth weight, anemia learning disabilities, increased morbidity and mortality rates, and low work productivity. The condition is of epidemic proportions in the developing world, glaringly so in South Asia and sub-Saharan Africa where high levels of poverty and limited access to diverse food options aggravates the situation. [Every second pregnant woman and about 40 percent of preschool children are estimated to be anemic.]<sup>iii</sup>

Pulses are part of traditional diet in many developing countries, particularly in South Asia, Africa and Latin America, where they play an important role as a major source of macro- and micro-nutrition. Along with 23% protein content on average, which is twice more protein compared to wheat and thrice that of rice, pulses are also rich in iron, potassium, magnesium and zinc.

Crop science and research has further demonstrated an even higher potency of pulses in alleviating micro-nutrient deficiency. Scientists at the International Center for Agricultural Research in the Dry Areas (ICARDA) analyzed more than 1700 accessions of lentil germplasm, breeding lines, cultivars, and wild relatives for their micronutrient content and found the iron content to vary hugely from 43 to 132 parts per million (ppm) and the zinc content from 22 to 96 ppm (read [Science Matters](#)). The lentil varieties with higher iron and zinc concentration can intensify the intake of micro-nutrients as part of routine traditional diets.

#### **Pulses are potent food to fight anemia**

*A bowl of cooked lentil (100 gm) can provide as much as 65 percent of daily requirements of iron for young children and 37 percent for women. Their high potency for combating anemia was further established by a study completed by scientists on children in Sri Lanka with mild anemic children. The results showed that when fed on 50 gm of red lentils per day for two months, the children showed significant improvement in their iron status.*

Several micro-nutrient intense lentil varieties screened by the scientists have been released by national programs in India, Bangladesh and Nepal. 'Pusa Vaibhav' variety of lentil, containing 102 ppm iron, is doubling up iron content and contributing to reducing anemia in Bihar, Uttar Pradesh and Madhya Pradesh states of India. Similarly, Bangladesh released 'Barimasur-8', which is providing 25 percent more of iron and 60% more of zinc to the farmer families. The fortified lentils have already reached more than 1.2 million farmers in the region.

Reviving the pulses diet, however, is a challenge of our times. Thanks to the Green Revolution, we saw global intensification of cereals with high yielding varieties from the 1970s to mid-1990. It dramatically improved their abundance addressing world hunger. However, it had a fallout – micronutrient-rich foods such as pulses got neglected and even replaced.

In India, the productivity of pulses saw a mere 12.2 percent increase from 1966 to 2009 as against the 162.6 percent increase in yield of wheat,<sup>iv</sup> not to mention the dramatic reduction in cultivation area for pulses. Farmers switched to cereals with the advent of Green Revolution technologies, further promoted by government subsidies for cereals. A concurrent drop in pulses consumption was inevitable. The annual pulses consumption per capita has dropped by roughly 28 percent in poor and rural households and by an even steeper amount of 37 percent in rich households over the past two decades.<sup>v</sup> The trend of cereal mono-cultures has also been detrimental to soil productivity since pulses replenish the soil through atmospheric nitrogen fixation.

With the designation of UN's 2016 International Year of Pulses, it's time to change that and put more pulses back in – both on our plates and in the fields.

Giving millions of children like Sunil a chance at healthy and normal development is an easy fixwell within our reach – an opportunity we cannot afford to not avail. Pulses not only complete a diet providing both macro and micro-nutrients but also make the soils healthier for sustainable food production – making the deal even sweeter.

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<sup>i</sup><http://micronutrient.org/mi-in-the-world/asia/india/>

<sup>ii</sup><http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2782240/>

<sup>iii</sup><http://www.who.int/nutrition/topics/ida/en/>

<sup>iv</sup>[http://oar.icrisat.org/6812/1/26\\_Policy\\_BriefIndia%20\\_2013.pdf](http://oar.icrisat.org/6812/1/26_Policy_BriefIndia%20_2013.pdf)

<sup>v</sup><http://www.slideshare.net/southasia-ifpri/ifpri-changing-consumption-pattern-of-pulses>