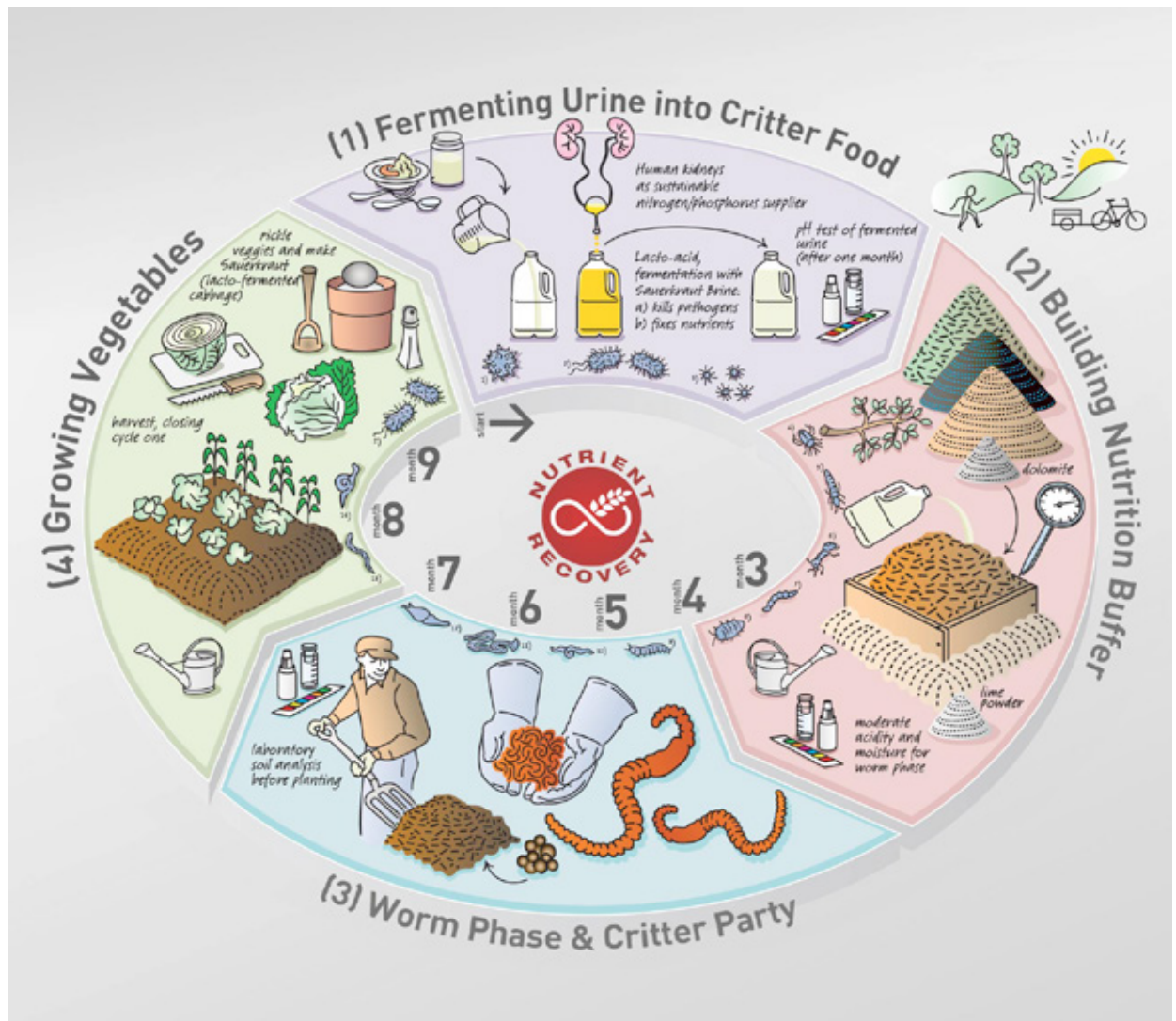


# FEEDING SOCIAL ORGANISMS MAKING TERRA PRETA



Terra Preta provides regenerating, long-lasting soil fertility informed by recent insights on plant nutrition and the role of soil microbes. This 'empathetic approach' is guided by the practice of biologist Dr. Jürgen Reckin and scientific research at the Institute of Wastewater Management at Hamburg University of Technology and allows the conversion of human waste products into the food cycle in a responsible and safe way.



A BALANCED INPUT OF GREEN WASTE AND **FERMENTED** HUMAN WASTE PRODUCTS ARE TREATED IN A TWO-STEP PROCESS OF LACTO-FERMENTATION AND VERMIN-COMPOSTING.

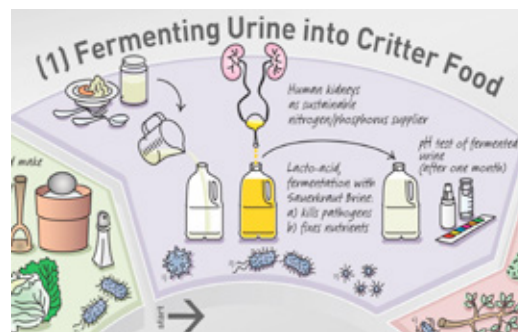
The system is based on a balanced input of green waste and human waste products that are treated in a two-step process<sup>1</sup> of lacto-fermentation, followed by vermin-composting. Lacto-fermentation (widely used to preserve foods) is a biological anaerobic (airless) process that doesn't release any odors. Vermin-composting employs the digestion of earth worms which make nutrients palpable to plant roots.

An organic charcoal mix (containing finely shredded wood and ash) provides the buffer medium to host the micro-organisms and optimize the carbon-nitrogen ratio required for vermin-composting. The high black carbon content is characteristic for Terra Preta soils, which contributes to their amazing water retention and nutrition storage properties<sup>2</sup>. Instead of using artificial (mineral) fertilizer, fully stabilized, fermented urine is used because it concentrates 80% of water-soluble plant nutrients like nitrogen, phosphorus and potassium delivered free of charge by the human organism day by day.

The Nutrients Recovery adapts the Terra Preta method that works best — using a minimum of resources — alongside full-time employment and with existing infra-structures. The main pre-requisite is time since it takes up to six months to produce Terra Preta black soil consisting of the following phases:

- 1) Lacto-fermentation of urine (ca. one month)
- 2) Micro-biological conversion of carbon and nutrients (ca. three months)
- 3) Vermin-composting (ca. two months)

Between each phase the developing substrate is observed and moderated to ensure the integrity of the final fertilizer. Depending on weather and local conditions this process will be sensitively adapted.



FERMENT & APPLY URINE — COLLECT URINE IN RECYCLED MILK CONTAINERS AND FERMENT WITH SAUERKRAUT BRINE. AFTER THE MONTH-LONG LACTO-ACID FERMENTATION ITS PH VALUE NEEDS TO GO BELOW 4 AND TURN SOUR. ONLY PH-TESTED URINE IS APPLIED AT A RATE OF 3 LITERS EVERY THIRD DAY OVER EACH COMPOST BED.

REFERENCES

<sup>1</sup> *Development Process and Possible Manufacturing Method, Notes from an excursion to Dr. Jürgen Reckin's Terra Preta Garden on April 28, 2012* [German], Kathrin Ollendorf, Wendepunkt Zukunft, 2012. [http://wendepunktzukunft.org/wp-content/uploads/2012/07/TerraPreta\\_Exkursion\\_DrReckin-3.pdf](http://wendepunktzukunft.org/wp-content/uploads/2012/07/TerraPreta_Exkursion_DrReckin-3.pdf)

<sup>2</sup> *The Amazon, Unnatural Histories*. TV documentary, BBC Four. The story of a far less natural Amazon is revealed — enormous manmade structures, even cities, hidden for centuries under what was believed to be untouched forest. All the time archaeologists are discovering ancient, highly fertile soils that can only have been produced by sophisticated agriculture far and wide across the Amazon basin. This startling evidence sheds new light on long-dismissed accounts from the very first conquistadors of an Amazon teeming with people and threatens to turn our whole notion of wilderness on its head. <http://www.youtube.com/watch?v=-YS8l6AZRfg> [cue at 34:44 minutes]