

Supplemental Knowledge Paper: Quantifying the Abundance



Subtitle: Empirical Data on Crop Uptake Versus Soil Bank Reserves

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Authoring Body: PQNK Knowledge Initiative

Reference: Supplemental to "Knowledge Paper: The Perpetual Abundance Principle"

1.0 Preamble

This supplemental document provides the empirical backbone to the philosophical and scientific arguments presented in the main PQNK knowledge paper, "The Perpetual Abundance Principle." The following data and analysis translate the principle of abundance into tangible, quantifiable terms, using region-specific yields for the subcontinent. It serves to remove any abstraction, making the "undeniable disparity" between soil reserves and crop demand irrefutably clear.

2.0 The Core Data: Annex A - Crop Uptake vs. Soil Bank Reserves

The following table is the cornerstone of this supplement. It details the nutrient removal of major crops at typical subcontinental yields against the immutable background of the soil bank's total reserves.

Annex A: Crop Nutrient Uptake vs. Soil Bank Reserves per Acre

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Crop	Average Yield (kg/acre)	Phosphorus (P) Uptake (kg/acre)	Potassium (K) Uptake (kg/acre)	Nitrogen (N) Uptake (kg/acre)
Soil Bank Reserve (kg/acre)		**P: 800	K: 14,000	N: 2,000**
Wheat	2,000	4.4	10.0	44.0
Rice	2,000	4.2	12.0	38.0
Corn	4,000	12.0	20.0	112.0
Potato	12,000	9.6	66.0	60.0
Cotton	1,400	4.9	11.2	35.0
Sugarcane	48,000	24.0	144.0	96.0

Source: Crop uptake data calculated from standard agronomic removal values. Soil Bank Reserve based on median global soil composition data (Sparks, 2003) for the plow layer.

Footnotes on Soil Bank Reserves:

- **Phosphorus (P: 800*):** The 800 kg represents the total elemental phosphorus in the topsoil. The ultimate "geological bank" is the parent rock and deep sediments, a reserve of thousands of tonnes per acre that is continuously weathered by the microbial assembly line, making the P cycle truly perpetual.
- **Nitrogen (N: 2,000*):** The 2,000 kg represents the total nitrogen in soil organic matter. The ultimate, infinite bank is the Earth's atmosphere, which is 78% nitrogen gas (N₂). This atmospheric reserve is continuously replenished into the soil by nitrogen-fixing microbes (diazotrophs).
- **Potassium (K: 14,000):** The immense reserve in the soil's mineral structure alone demonstrates overwhelming abundance, and it is also continuously weathered from an even larger geological reserve.

3.0 Analysis: Interpreting the "Undeniable Disparity"

The data in Annex A reveals a consistent and staggering reality across all crops:

The ratio of the Soil Bank Reserve to the annual Nutrient Uptake is overwhelmingly large.

To illustrate this, let us take the example of Wheat:

The Topsoil "Current Account" vs. Crop Demand - Wheat

Element	Total in Topsoil/ Acre (kg)	Crop Uptake/ Acre (kg)	Ratio (Bank:Withdrawal)
Phosphorus (P)	~800 kg	~4.4 kg	~182 : 1
Potassium (K)	~14,000 kg	~12 kg	~1,167 : 1
Nitrogen (N)	~2,000 kg	~40 kg	~50 : 1

This means:

- For every 1 kg of Phosphorus the wheat crop removes, the soil bank holds 180 kg in reserve.
- For every 1 kg of Potassium removed, the bank holds a staggering 1,400 kg.
- Even for Nitrogen, which has a smaller total reserve and higher plant uptake, the bank holds 45 times the annual withdrawal.

This pattern holds true even for the heaviest feeder, Sugarcane. While it removes 24 kg of Phosphorus, the 800 kg reserve is still 33 times larger than this substantial withdrawal.

4.0 Implications for the PQNK System

This quantitative analysis leads to two inescapable conclusions:

- I. **The Problem is Access, Not Scarcity:** The data proves conclusively that mineral deficiency in agriculture is a management failure, not a resource shortage. The soil is not "poor"; our methods are. The crisis is one of liquidity, not capital.
- II. **The Folly of Input-Based Agriculture:** The practice of applying, for example, 50 kg of P_2O_5 fertilizer to meet a wheat crop's need for ~4.4 kg of P is revealed as fundamentally illogical. It is an attempt to solve a biological access problem with a chemical brute-force approach that further damages the very biological system required for the solution.

5.0 Conclusion: Data as a Testament to Natural Design

This supplement provides the numerical proof that validates the PQNK paradigm. The "Perpetual Abundance" is not a philosophical concept but a quantifiable reality. **The figures in Annex A should liberate the farmer from the fear of scarcity and redirect their focus from procuring external inputs to nurturing the internal, biological key—the microbial assembly line.**

The annotated reserves for P and N further strengthen this argument, revealing that the soil bank is not a static pile of minerals but a dynamic interface connected to infinite reserves—the bedrock and the atmosphere. By adopting the PQNK principles, we shift from being

miners of a finite resource to wise managers of an infinite, self-replenishing system. The data shows us unequivocally that the path to sustainable, prosperous agriculture lies not in the fertilizer bag, but in the life within the soil.

Footnote: Any Production Process That Inundates Soil With Water, Disturbs Soil Through Tillage, Or Leaves Soil Bare Without Organic Mulch Cover Does Not Qualify As Natural Ecosystem Science For Production Agriculture.

PQNK, to be pronounced as 'picnic', which stands for Paedar Qudratti Nizam Kashatqari, and means: the regenerative & sustainable Pristine Organic Farming System.

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WhatsApp +92 320 677 6666