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Cotton Farming Crisis Creates Opportunity for Millets Revival in Tribal Odisha

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Introduction

Rayagada, a tribal-dominated district in southern Odisha, reflects the ecological and economic vulnerabilities of shifting from traditional mixed farming systems to monoculture cotton cultivation. Cotton's promise of quick income has been overshadowed by debt, ecological degradation, and climate-related risks, particularly as unregulated *Bt* cotton seeds spread throughout the region. In contrast, millet cultivation - long marginalized but deeply rooted in tribal agro-ecology- is being revived, supported by community resilience and state-led interventions such as the Odisha Millets Mission (OMM) launch in 2017 and The Shree Anna Abhiyan (SAA), which is a Special programme for the promotion of Millets in Tribal Areas of Odisha.

Ecological Degradation Under Cotton

1. Soil nutrient depletion due to monoculture and intensive use of inputs.
2. Water stress in a fragile rainfed Agro-ecology.
3. Pest evolution is reducing the utility of illegal *Bt* cotton.
4. Biodiversity loss with the collapse of traditional crop diversity.

Socio-Economic Pressures

- Debt cycles from high-cost commercial seeds and chemical inputs.
- Market exploitation by middlemen who capture the bulk of cotton's value.
- Institutional neglect due to weak rural banking access and poor extension services.
- Knowledge gaps, leaving tribal farmers vulnerable to misinformation about seed and pesticide use.

The Millet Revival

With growing mistrust in cotton, farmers are turning back to millets. This return reflects not just an economic necessity, but also cultural pride and nutritional security.

- Cost-effective cultivation: Millets require little external input.
- Resilience to erratic rainfall: Their short cycles match Rayagada's unstable climate.
- Restoration of agro-biodiversity: Millets thrive in intercropping systems, rebuilding ecological balance.
- Nutritive value: Millets provide iron, calcium, and fiber, improving local diets.

- Policy support: Through the Odisha Millets Mission, subsidies, training, and market linkages are improving farmer confidence.

Table 1: Comparative Overview: Cotton vs. Millets

Parameter	Cotton (Rainfed)	Millets (Traditional Varieties)	Implications for Farmers
Water Requirement	600 mm (high)	300mm (low)	Cotton depletes scarce water, millets thrive on limited rainfall
Input Costs	High: hybrid seeds, pesticides, fertilizers	Low: largely seed-saved, minimal fertilizer use	Millets reduce dependency on credit and input markets
Pest Vulnerability	High: bollworms, whitefly, pink bollworm (Bt resistance emerging)	Low: generally resilient with diverse varieties	Cotton drives pesticide traps, millets lower risk
Market Dependence	High: heavily controlled by traders/middlemen	Moderate: supported through OMM procurement and local consumption	Cotton exposes farmers to price exploitation, millets ensure food and income security
Soil Health Impact	Negative: monoculture reduces fertility	Positive: supports mixed cropping, restores nutrients	Millets can regenerate degraded land
Climate Resilience	Low: sensitive to erratic monsoon patterns	High: drought, heat and flood resilience crop	Millets provide stability in climate-uncertain environments
Food/Fodder Value	None: cash crop with no local dietary use	High: nutritious staple + livestock fodder	Millets improve household self-reliance
Average Yield	400–600 kg lint/acre (declining over time)	800–1000 kg grain/acre (depending on variety)	Millets often yield more usable produce per acre in rainfed conditions
Risk of Debt	High: input costs + volatile markets	Low: self-seed saving + local utility	Millet adoption reduces indebtedness

Discussion

The contrast in outcomes between cotton and millets illustrates a fundamental debate within Indian agriculture: the ecological unsuitability of commercial monocultures versus the resilience of traditional, low-input, diverse systems. Cotton has proven to be a maladaptation to Rayagada's

fragile ecology, fostering financial dependence and ecological crises. Millets, by contrast, align with both ecological necessity and cultural food systems, embodying an intersection of food sovereignty, resilience, and empowerment.

Fig: Millets successfully cultivated by Gunupur Farmers in Rayagada District, Odisha

Conclusion

The trajectory of Rayagada's cotton crisis underscores the risks of profit-driven monoculture strategies in tribal farming systems. The millet revival, however, demonstrates the possibility of integrating ecological wisdom with modern policy frameworks to secure sustainable rural futures. While cotton amplified ecological risks and economic vulnerability, millets now offer stability, climate adaptation, and greater food-fodder security. This shift represents not a nostalgic return to the past, but an emergent model for sustainable tribal agriculture in India.

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