

Fatal Economics of Jaggery – Commodity and Commerce

How Unfair Pricing Threatens Quality and Sustainability

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Jaggery, a traditional non-centrifuged sugar, represents one of India's most significant agro-processing sectors. With India producing approximately 70% of the world's jaggery from 88.5 million tonnes of sugarcane annually through 40,000 small units, the economics of this ₹18,500 million industry (₹7,500 million export + ₹11,000 million domestic) faces an existential crisis. The fundamental question confronting this sector is: can quality jaggery production survive when commodity market prices render unethical business practices making the business economically impossible?

The Pricing Crisis: A Death Spiral for Quality Production

Current commodity market prices of jaggery range between ₹40-60 per kg—a catastrophic level that makes quality-conscious production simply not sustainable and therefore economically suicidal. This pricing reality exposes the brutal mathematics destroying India's jaggery industry and forcing producers into dangerous, unethical manufacturing practices.

Table 1: Comparative Manufacturing Cost Analysis (Per Kg of Jaggery)

Cost Component	Traditional Plant	Mechanized Plant
Sugarcane @ ₹4,100/ton <i>Net Jaggery yield</i>	₹85.40 (@ 5% yield)	₹61.00 (@ 7% yield)
Labor	₹65.60	₹46.90
Packing	₹1.50	₹1.50
Electricity	₹8.00	₹8.00
Total Production Cost	₹161	₹117
Commodity Market Price	₹40-60	₹40-60
Loss Per Kg at Market Price	₹101-121	₹57-77

The numbers reveal an industry in terminal crisis: farmers don't receive compensation for all input costs—they cannot even meet conversion costs of labor, packing, and electricity (₹75.10 for traditional, ₹56.40 for mechanized). At ₹40-60/kg market prices, traditional producers would face

catastrophic losses of ₹101-121 per kg, while even highly efficient mechanized plants would lose ₹57-77 per kg. This pricing makes sugarcane—the fundamental raw material—a cost that producers cannot afford to account for. The ₹85.40 (traditional) or ₹61 (mechanized) sugarcane cost per kg simply evaporates, unpaid and unrecognized in the brutal economics of commodity markets.

In the unorganized jaggery sector, many small cane farmers—often unfamiliar with proper costing—are compelled to use the practices described below as a survival strategy.

The Survival Trap: When Pricing Forces Dangerous Practices

Operating at such devastating losses, producers face a stark choice: exit the business or engage in practices that compromise safety, quality, and ethics. The commodity market's unfair pricing compels & forces producers into dangerous unethical survival strategies:

- Severe Adulteration with Sugar:** Facing ₹101-121/kg losses, producers desperately add refined or raw sugar to reduce cane crushing requirements by 30-40%. This adulteration—now a survival necessity rather than unethical choice—dilutes essential minerals and nutrients, transforming jaggery into mere sweetener. The pricing crisis has made genuine jaggery production financially unviable, pushing widespread adulteration to become the industry norm—an outcome that, ironically, serves the interests of the sugar industry.
- Hazardous Waste as Fuel:** Traditional plants, being energy inefficient, require substantial fuel purchases for the open-pan boiling process. With crushing pricing pressure leaving no margin for proper fuel, producers resort to burning municipal and industrial waste including plastics, tires, cotton waste, and toxic materials—available free or at minimal cost. This desperate fuel substitution creates a cascade of disasters: toxic NOx gases polluting air, harmful chemical contamination of jaggery through smoke

absorption, severe health hazards for workers and nearby communities, and water pollution from ash disposal. What appears as environmental crime is actually economic compulsion—the ₹40-60/kg price makes legitimate fuel procurement financially suicidal and Jaggery a “poison”.

3. **Chemical Shortcuts:** Polyacrylamide and sodium hydrosulphite—well known carcinogens—become economically mandatory clarifying agents. Their low cost and efficiency in processing make them irresistible to producers hemorrhaging ₹57-121/kg. Unlike sugar manufacturing where polyacrylamide is discarded with molasses, in jaggery production it remains in the final product, creating serious health risks for consumers. But at current pricing, health safety becomes an unaffordable luxury.
4. **Quality Degradation:** IS 12923 compliance requires investments in quality control, hygiene, and processing discipline but that is perceived to generate zero economic return when market prices don't even cover basic production costs. Producers abandon quality standards not from choice but from survival necessity—quality compliance accelerates bankruptcy. The result: very low shelf life of jaggery with high moisture, inconsistent composition, and hazardous contamination in place of what should be 18-24 month shelf-life having premium nutrition products.

The Consumer Tragedy: Unknowing Victims of Price Wars

End consumers remain entirely innocent, unaware, and unwary of the sweet poison they consume, seduced by the fatal attraction of low prices. The ₹40-60/kg jaggery appearing as an affordable traditional sweetener is, in reality, a hazardous cocktail of severe sugar adulteration (30-40%), carcinogenic chemical residues (polyacrylamide, sodium hydrosulphite), toxic contamination from hazardous waste combustion, and degraded nutritional value. Consumers believe they are purchasing wholesome traditional jaggery rich in minerals and health benefits, while actually consuming adulterated products that pose serious health risks. This consumer ignorance is not willful—it stems from complete absence of quality disclosure mechanisms, misleading labeling practices that disguise adulterated products as authentic jaggery, and lack of public awareness about the catastrophic quality crisis in commodity jaggery markets. The low price that attracts consumers is not a bargain but a warning signal of compromised safety and quality—yet without education and transparency, consumers remain trapped in unknowing consumption of contaminated

products, their health sacrificed at the altar of unsustainably low pricing.

The Domino Effect: Unfair Pricing Destroying the Industry

The commodity market's ₹40-60/kg pricing is so dominant and destructive that it poses an existential threat to any fair producer attempting quality-conscious operations. The economic realities create an impossible business environment:

- No producer—traditional or mechanized—can survive at these prices without compromising ethics
- Fair producers investing in quality, safety, and compliance face guaranteed bankruptcy
- The pricing systematically drives ethical producers out of business
- Market dominance of adulterated, contaminated products becomes inevitable
- There are zero incentives for producers to remain in legitimate jaggery business
- New entrants entering the business must adopt unfair practices from day one to survive

This is not market competition—this is market destruction. The commodity pricing has created a death spiral where only the most unethical operators survive, while quality-conscious producers are systematically eliminated. Even mechanized plants with 27% cost advantage (₹117 vs ₹161/kg) and 40% better yield cannot survive the ₹57-77/kg losses imposed by market prices. The industry is being hollowed out, leaving only adulterated, contaminated products masquerading as jaggery.

The Policy Imperative: Intervention Required for Industry Survival

The jaggery industry's crisis demands urgent policy-level intervention. Market forces have failed catastrophically, creating a race to the bottom where ethical production is impossible and adulteration is mandatory. The IS 12923 standard defines quality parameters for jaggery, but these remain meaningless aspirations when market economics actively punish compliance.

Characteristics of Quality Grade I Jaggery (Currently Economically Unviable):



- Moisture content: <1% (versus 5-8% in commodity jaggery)
- Shelf life: 18-24 months (versus 3-4 months)
- Sulfur-free, chemical-free, hygienic processing
- Consistent color, texture, and nutritional profile
- Export compliance to developed countries
- Produced from 100% sugarcane juice without adulteration
- Processed using food-grade equipment and legitimate fuel sources

Current market pricing makes every single quality parameter economically impossible to achieve. Policy intervention must establish minimum price floors that enable viable production of IS 12923 compliant jaggery.

Required Policy Framework for Industry Viability

Comprehensive policy-level changes are essential along with its rigorous implementation to ensure the viability of the jaggery business and protect public health:

1. **Minimum Price Floor Implementation:** Establish mandatory minimum pricing of ₹150-180/kg for IS 12923 Grade I compliant jaggery. This pricing level covers actual production costs (₹117-161/kg) plus reasonable returns on capital investment (15-20% ROI), working capital requirements, and quality maintenance. Anything below ₹150/kg perpetuates the current crisis where ethical production is economically impossible.
2. **Revision of IS 12923 Standard:** Include mandatory testing methodology for sugar adulteration detection, polyacrylamide residue limits, and ash content analysis to identify contamination from hazardous waste combustion. Current standard inadequacy enables widespread malpractices that destroy market integrity.
3. **Mandatory Process Audits:** Annual third-party audits certifying polyacrylamide-free production, GRAS (Generally Recognized As Safe) clarificant usage, legitimate fuel sources, and pollution control compliance. Surprise inspections to prevent fraudulent certification and ensure continuous compliance.
4. **Strict Pollution Control Enforcement:** Rigorous enforcement of MPCB/CPCB guidelines for boilers and heaters. Ban on use of municipal and industrial waste as fuel with heavy penalties for violations. Mandatory fuel

source documentation and emission testing to eliminate hazardous waste combustion that contaminates jaggery and pollutes the environment. Also, enforcement of wash water treatment plants is needed to prevent soil & water body pollution.

5. **Product Traceability Mechanisms:** Implementation of comprehensive traceability from sugarcane source to final product to prevent C3/C4 sugar mislabelling and verify authentic jaggery versus adulterated substitutes. QR code systems linking products to certified production facilities.
6. **Fiscal Support for Mechanization:** Credit facilities at fair & reasonable terms, capital investment grants, moratorium on interest payments & principle term loan instalments and tax incentives for modern technology adoption. Mechanized plants demonstrate 27% cost reduction and 40% yield improvement—policy must actively enable this technological transition rather than abandoning producers to commodity market destruction.
7. **Consumer Awareness Campaigns:** Government-led generic publicity promoting jaggery as healthier alternative to refined sugar while educating consumers on identifying quality products versus adulterated/contaminated substitutes. Clear labelling requirements distinguishing IS 12923 compliant jaggery from commodity market products.
8. **Incentive Structures for Compliance:** Create positive incentives for producers remaining in legitimate business through preferential procurement programs, export facilitation, quality certification benefits, and market access support. Currently there are zero incentives—policy must reverse this to retain ethical producers.

Conclusion: A Policy Choice Between Quality and Catastrophe

India's ₹18,500 million jaggery industry faces an existential crisis manufactured by unfair commodity pricing. The current market reality—₹40-60/kg prices against ₹117-161/kg production costs—has created an economic environment where ethical production is impossible, adulteration is mandatory, and quality compliance guarantees bankruptcy.

This pricing crisis forces producers into severe adulteration with sugar (30-40% cane reduction), hazardous waste combustion creating toxic contamination and severe air/water pollution, carcinogenic chemical usage, and systematic



quality degradation. The result is not merely an economic problem but a public health catastrophe where consumers unknowingly purchase adulterated, contaminated products labeled as traditional jaggery.

The unfair pricing is so dominant that it poses a serious threat to the sustenance of any fair producer, systematically driving ethical operators out of business. With zero incentives to remain in legitimate production, the industry faces complete collapse into a market of exclusively adulterated, contaminated products. Even mechanized plants—demonstrating 27% cost efficiency and 40% better yields—cannot survive commodity market economics that impose ₹57-77/kg losses.

A policy-level change is therefore essential—not optional—to ensure viability of the jaggery business. The solution requires comprehensive regulatory intervention: minimum price floors of ₹150-180/kg for IS 12923 compliant products, mandatory quality standards enforcement, pollution control measures, traceability systems, fiscal support for mechanization, and incentive structures retaining ethical producers. Without decisive policy action establishing fair pricing frameworks, India's traditional jaggery will transform completely into adulterated, contaminated substitutes, destroying both a cultural heritage and public health while decimating the livelihoods of ethical producers who refuse to compromise on quality and safety.

