

How to grow more rice without draining the land



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Over the past 25 years, Bangladesh has added nearly five crore people to its population, intensifying pressure on the country's staple: rice. While production has grown, its pace has lagged behind population growth, raising fresh questions about long-term food security and sustainability.

Bangladesh's population rose from about 12.9 crore in the year 2000 to roughly 17.6 crore in 2025, an increase of more than one-third. Over the same period, national rice output increased from around 3.6 crore tonnes to 3.7-3.9 crore tonnes, indicating only modest net growth. Experts say yield growth has slowed in the last decade as land constraints, climate stress, and resource limitations intensified. Total rice demand continues to rise due to population growth, meaning even small production fluctuations can influence prices and imports.

This long-term pressure is now amplified by the ongoing energy crisis. With the critical Boro paddy season disrupted by acute diesel shortages, increased fuel costs, and power outages, traditional, resource-heavy farming is proving dangerously vulnerable. Thousands of irrigation pumps have lain idle and state-run fertiliser factories have faced forced shutdowns. This immediate crisis underscores that shifting to sustainable agriculture is no longer just a future environmental goal, but an urgent necessity. As the country looks for ways to produce more rice with fewer resources, adopting modern, resilient practices can offer a vital lifeline.

The central challenge facing Bangladesh is compounded by the fact that the relationship between rice production and the environment is a dangerous two-way street. The drive for

higher yields through traditional methods is actively harming the ecosystem in several ways.

Methane emissions: Traditional rice cultivation requires fields to remain flooded for long periods. Under these waterlogged conditions, soil microorganisms decompose organic matter without oxygen, producing methane (CH₄)—a greenhouse gas far more potent than carbon dioxide in trapping heat. Globally, rice cultivation contributes roughly 10-12 percent of agricultural greenhouse gas emissions, and Bangladesh is a significant contributor.

Groundwater depletion: Dry-season Boro rice, which accounts for more than half of Bangladesh's total output, depends heavily on groundwater. Millions of tube wells pump water from underground aquifers, causing water levels to decline precipitously in regions like northwestern Bangladesh. Pumping this water requires immense energy, contributing to carbon dioxide emissions and leaving farmers vulnerable to fuel shortages.

Fertiliser pollution and nitrous oxide: Inefficient use of chemical fertilisers, particularly urea, releases nitrous oxide (N₂O) into the atmosphere, another powerful greenhouse gas. Over application also leads to nutrient runoff into rivers and wetlands, destroying water quality and aquatic ecosystems.

Ecosystem loss: Expanding agricultural footprints can lead to the loss of biodiversity and the reduction of vital wetlands, which play a crucial role in natural carbon storage, flood control, and supporting rural fisheries.

Simultaneously, climate change is increasingly threatening the very rice farming that contributes to it. Rising temperatures, erratic rainfall, frequent floods, droughts, and salinity intrusion in coastal regions are already affecting crop yields. Studies suggest that temperature increases during the growing season can significantly reduce yields, particularly for Boro rice, while sea-level rise threatens soil fertility through

Climate-tolerant varieties: Deploying rice strains resistant to floods, salinity, and drought is one of the most effective tools. These varieties help stabilise yields in vulnerable regions such as coastal belts and flood-prone haor areas, reducing the risk of crop loss.

Smarter irrigation: Techniques like alternate wetting and drying (AWD), where fields are not kept continuously submerged, can cut

management can significantly improve fertiliser efficiency. Applying nutrients precisely when and where crops need them reduces chemical waste and nitrous oxide emissions.

Integrated Pest Management (IPM): Using biological controls and monitoring pests before spraying helps farmers reduce toxic pesticide use without sacrificing productivity, protecting biodiversity and human health.

Reducing post-harvest losses: A massive portion of rice is lost during harvesting, drying, storage, and milling due to outdated practices. Upgrading to modern milling facilities and hermetic storage technologies could save millions of tonnes annually, effectively increasing food availability without growing a single additional crop.

Mechanisation: The use of rice transplanters, combine harvesters, and other modern equipment can increase efficiency, offset rural labour shortages, and support resource-saving practices like direct-seeded rice.

Opportunistic expansion: While the primary focus must remain on intensifying yields on existing farmland, Bangladesh can also strategically explore new agricultural frontiers. Newly emerging river char lands and parts of the coastal region offer opportunities for expanding cultivation, provided climate-resilient varieties and community-based irrigation are used.

Bangladesh's success in increasing rice production over the past few decades has been vital for national food security, serving as a global example of agricultural progress. However, the environmental and energy costs of intensive, traditional cultivation can no longer be ignored.

The path forward for our rice sector is not about producing at any cost, but about producing smarter. By combining scientific innovation, efficient resource management, and strong agricultural policies, Bangladesh can achieve sustainable growth—increasing yields even under a constrained environment while safeguarding the natural resources its people depend on.



PHOTO: MOSTAFA SHABUJ

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seawater intrusion.

How can Bangladesh produce more rice to feed a growing population without damaging the environment on which agriculture depends? The answer lies in adopting a strategy of sustainable intensification—increasing productivity from existing farmland while actively reducing environmental stress. Agricultural specialists point to several key strategies.

water use significantly while drastically lowering methane emissions. Pairing this with solar-powered pumps and better field levelling helps farmers reduce energy costs and bypass grid failures.

Precision nutrient management: Modern techniques such as site-specific nutrient management, leaf colour charts for nitrogen application, and integrated soil fertility

Global buyers must share the cost in RMG's green transition



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For years, Bangladesh's export success was built on a simple promise to global buyers. We would deliver at scale, at speed, and at low cost. In return, the buyers invested, expanded, and hired millions of workers and helped turn the country into one of the world's leading sourcing destinations.

The times, however, they are a-changin'.

Across the global supply chain, decarbonisation is becoming a new commercial test. Buyers increasingly want suppliers to cut emissions, install renewable energy, upgrade machinery, improve energy efficiency, recycle effluent, track data more closely, and meet a growing list of environmental requirements. In principle, this is understandable. Climate change has posed many real challenges for us and the apparel sector, like many other industries, must reduce its environmental impact. However, I believe there is a serious problem in how this transition is unfolding.

Too often, decarbonisation and sustainability are being treated not as a shared responsibility but as a cost to be pushed down the supply chain. My personal observation is that, in Bangladesh, that means the burden

is falling hardest on small and medium-sized enterprises. This is creating a dangerous divide especially when larger suppliers, with stronger balance sheets and easier access to finance, are better placed to respond to the pressing demand to go greener. They can invest in solar energy, efficient boilers, water recycling, modern machinery, energy audits, and compliance teams. Smaller factories, even if they are efficient, reliable, and vastly experienced, often cannot move at the same speed. They may lack access to affordable finance or not have the land, internal technical capacity, or margin room to fund major upgrades on their own. This means buyers are consolidating their sourcing base around bigger partners who can promise rapid progress on decarbonisation. Small and medium-sized enterprises (SMEs), including many that have served customers loyally for years, are being quietly edged aside. This should concern all of us.

Bangladesh's SME manufacturers are the backbone of the economy. They create employment, support local communities, and often provide flexibility, specialised production, and entrepreneurial energy that

larger groups alone cannot replace. If these businesses are slowly phased out because they cannot self-fund the green transition, then the country risks building a two-tier industrial model. One tier will consist of large suppliers able to keep pace with rising buyer demands while the other will be made up of smaller firms struggling to survive not because they are unwilling to improve, but because they are being asked to finance a global transition without any support.

For decades, international buyers benefited from Bangladesh's low wages, competitive overheads (operating costs such as factory rent, utilities, staff salaries, and maintenance), and relentless pressure on prices. That cost advantage helped global brands, retailers and importers build profitable sourcing models. Now, when major investment is needed to decarbonise those same supply chains, many buyers appear to want the producing side to absorb the bill alone which is not entirely fair. If decarbonisation is genuinely a strategic priority, then it cannot be treated as a free add-on extracted from suppliers through tougher scorecards and shifting compliance demands. A factory cannot install new systems, reconfigure operations or invest in cleaner energy simply on goodwill. These are commercial decisions with real costs.

If the buyer still expects the lowest price, the fastest lead time and the highest compliance standard, while contributing nothing to the investment required, then decarbonisation becomes another mechanism for putting more pressure on the suppliers. And this will widen the existing gaps in the industry when it comes to being just and inclusive as many suppliers might fail to meet the goal, some

might lose orders, while the rest may leave the industry altogether. This issue is not limited to ready-made garments. Similar pressures are emerging across other export-oriented sectors. Wherever global supply chains adopt stricter environmental standards, the same question arises: who pays? If the answer is always the supplier, then developing-country producers will once again carry a disproportionate burden. However, I believe there is a better way.

First, buyers should move towards genuine co-investment models. If a supplier is expected to make measurable decarbonisation upgrades, then the commercial relationship should reflect that. This could include longer-term sourcing commitments, preferred supplier agreements, shared financing structures or direct support for approved projects. A buyer that wants cleaner production should be prepared to help create the conditions for it.

Second, pricing must become more honest. For years, sustainability has been discussed as if it can be delivered without any serious cost implications, which is unrealistic. Cleaner production often requires capital expenditure and operational adjustment. Suppliers cannot be expected to deliver lower emissions while prices remain detached from the cost of achieving them.

Third, SME-focused green finance needs to expand. Bangladesh's policymakers, financial institutions, and development partners should work together to design instruments that are practical for smaller manufacturers. Credit guarantees, concessional lending, pooled financing platforms, and technical assistance programmes can help here.

Financial schemes should be easy for SMEs to access without requiring extensive technical or financial expertise, while also avoiding overly strict or impractical conditions.

Fourth, technical support must be widened beyond the largest players. Many SMEs need help with energy mapping, emissions data, equipment selection, project design and verification. Shared service platforms, industry associations and public-private partnerships could play a bigger role here.

Finally, buyers should adopt transition pathways that are realistic and inclusive. Not every supplier can transform overnight. But many can make meaningful progress if expectations are clear, timelines are sensible, and support exists. The right question is not which factories are already perfect; it is which factories are committed and capable of improvement if given a fair chance.

Bangladesh should not accept a future in which only the largest suppliers are allowed to remain in the game while smaller firms are left behind. That would weaken the diversity and resilience of our industrial base. It would also send the wrong message to the businesses that helped build this country's export strength over decades. If global buyers want cleaner supply chains, they should not merely demand change from afar; they should contribute to the transition they say they want. They should support the suppliers, including SMEs, that have stood by them for years. They should also acknowledge that a truly sustainable global supply chain cannot be achieved if costs, risks, and responsibilities are distributed unfairly.

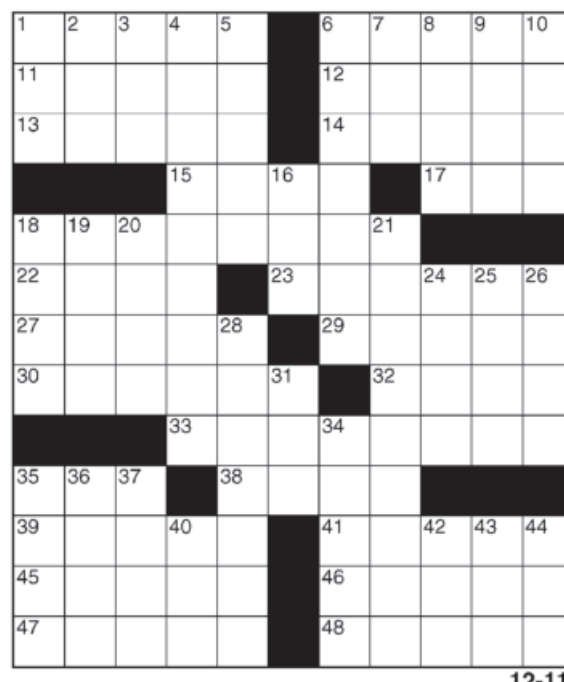
CROSSWORD
BY THOMAS JOSEPH

ACROSS
1 Taken --- (surprised)
6 Of the kidneys
11 Praline nut
12 Sports venue
13 Tick off
14 Burger part
15 Heaps
17 Bro's sibling
18 Chihuahua, for one
22 Leslie Caron film
23 Jazz pianist Garner
27 Less friendly
29 Mideast peninsula
30 Paris subways
32 Letter after epsilon

33 More disreputable
35 --- Vegas
38 Boat part
39 Entertain
41 Human, for one
45 "Water Lilies" painter
46 Christopher of "Superman"
47 Cart pullers
48 Rockies resort

DOWN
1 Phone download
2 Hive dweller
3 Star pitcher
4 Cleveland cagers
5 Ring
6 Toronto cagers
7 History stretch
8 Brooklyn cagers

9 Opposed
10 Puts down
16 Poem of praise
18 Narrow
19 Maze runners
20 Stepped down
21 Memphis cagers
24 "Dedicated to the --- Love"
25 Past due
26 Deceitful person
28 Houston cagers
31 Take to court
34 Horse's cousin
35 Tibetan monk
36 Singer Tori
37 Phoenix cagers
40 Spot
42 Energy
43 Genesis woman
44 Cub's cave



YESTERDAY'S ANSWERS

R	A	C	E	D	I	S	A	A	C
A	B	O	V	E	M	A	L	T	A
G	R	U	E	L	P	O	U	T	S
T	A	P	S	I	N	M	I	T	
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G	E	N	I	B	E	R	I	A	
		C	O	O	L	S			
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S	M	E	A	R	U	S	I	N	G
T	E	S	T	S	S	E	N	S	E

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