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Organic Farming and Farmer Income in India: Economic Opportunities, Constraints, and Policy Pathways

A Critical Review of Production Economics, Markets, Institutions and Policy

Baburao Vakada

Department of Economics, Government Degree College, Puttur, Andhra Pradesh, India

ABSTRACT: Organic farming is increasingly promoted in India as a pathway towards environmentally sustainable agriculture, resource conservation and improved rural livelihoods. Yet the relationship between organic production and farmer income is not uniform. Organic management can reduce expenditure on synthetic fertilizers and pesticides, increase on-farm recycling, diversify farm enterprises and create access to differentiated markets. At the same time, farmers may face transition-period yield reductions, greater labour requirements, certification costs, limited access to organic inputs and weak farm-gate price premiums. This review critically examines the economic conditions under which organic farming can contribute to higher and more stable farmer income in India. Evidence from Indian farm studies, long-term experiments, certification statistics, integrated farming systems and farmer producer organisation research is synthesized with international meta-analyses on yield gaps, profitability and diversification. India's certified organic farm area under the National Programme for Organic Production reached about 2.25 million ha in 2024–25, with another 1.71 million ha in conversion; certified organic farm production was about 4.39 million tonnes and organic exports were 368,155 tonnes valued at approximately ₹5,394 crore. The evidence indicates that organic farming is most economically attractive when lower purchased-input costs are combined with suitable crop selection, diversification, reliable markets, price premiums, collective organization and value addition. Conversely, conversion without transition support and market linkage can expose smallholders to significant income risk. The review proposes an income-centred policy framework based on cluster certification, FPO-led aggregation, local processing, transition assistance, digital traceability, market development and farm-level profitability assessment. Organic farming should therefore be viewed neither as a universally superior substitute for conventional agriculture nor as an inherently low-productivity system, but as a context-dependent economic strategy whose success depends on the interaction of agronomy, costs, prices, institutions and value-chain governance.

KEYWORDS: Organic Farming; Farmer Income; India; Profitability; Organic Certification; Smallholders; Farmer Producer Organisations; Value Addition; Sustainable Agriculture; Agricultural Policy

I. INTRODUCTION

Indian agriculture has entered a period in which productivity, profitability, environmental sustainability and climate resilience must be pursued simultaneously. The production gains associated with modern input-intensive agriculture have been substantial, but they have also increased concerns about soil degradation, nutrient imbalance, pesticide dependence, groundwater stress and rising exposure to purchased-input prices. These pressures are particularly important for small and marginal farmers, whose ability to absorb production shocks is limited. Organic farming has consequently received increasing attention as part of a wider movement towards agroecology, integrated farming, natural resource recycling and sustainable intensification.

Organic farming is not simply the absence of synthetic fertilizer and pesticides [1]. It is a production system based on ecological processes, biological nutrient cycling, crop rotations, organic amendments and preventive pest management. Its economic significance therefore arises through several channels: reduced cash expenditure on external inputs, changes in yields and labour requirements, improved soil condition, diversification of farm enterprises, access to premium markets and changes in risk. The central economic question is consequently not whether organic farming produces more or less than conventional agriculture, but whether the combination of output, cost, price and risk results in higher sustainable net income.

International evidence illustrates why simple yield comparisons can be misleading. A major meta-analysis found that organic yields were generally lower than conventional yields, but the size of the gap varied substantially with crop type, environmental conditions and management [2]. A later meta-analysis based on more than 1,000 observations reported an average organic yield gap of about 19%, while showing that crop rotations and multi-cropping substantially narrowed the gap [3]. Global evidence also indicates that organic farming can be financially competitive when price premiums compensate for yield reductions and additional labour costs [4]. The performance of organic systems is therefore strongly context-dependent [5].

The Indian context adds further complexity. The country contains highly diverse agroecological regions, farm sizes and market structures. Organic farming may be particularly compatible with areas where external-input use is already relatively low, where biomass resources are available, where high-value crops can be marketed at premiums, or where diversified farming systems permit effective nutrient recycling. However, organic production may be economically difficult where farms are highly specialized, labour is scarce, organic inputs are costly, and certified markets are poorly developed.

The scale of India's certified organic sector has expanded considerably [6]. According to the latest NPOP data, 2024–25 included approximately 2.25 million ha of certified organic farm area and 1.71 million ha in conversion, while certified organic farm production was about 4.39 million tonnes. Organic exports reached 368,155 tonnes with a value of approximately ₹5,394 crore [7]. The NPOP system also reports more than 2.18 million farmers participating through grower groups [7]. Earlier NPOP certification statistics provide a useful baseline for interpreting this expansion [8]. These statistics demonstrate that organic agriculture is now an economically significant component of Indian agriculture rather than a purely experimental niche.

However, national scale should not be interpreted as evidence that individual farmers automatically earn more. Farm-level research reveals both positive and negative outcomes. A pan-India survey found significant regional variation in the economic impact of organic agriculture [9]. Research on certified black-pepper farmers in Kerala found income benefits associated with certification, while also showing that fair-trade participation does not necessarily add income to organic certification in every dimension [10]. In contrast, a detailed economic appraisal of organic pineapple in northeastern India found that growers often failed to recover total production costs when imputed family labour and other non-cash costs were included [11].

This review therefore addresses a specific research problem: under what conditions does organic farming translate into improved farmer income in India? It synthesizes evidence on production economics, yield and cost trade-offs, certification, price premiums, FPOs, value addition, diversification and policy. Rather than presenting organic farming as uniformly superior or inferior, the article develops a conditional framework linking farm-level management and value-chain conditions to income outcomes.

II. REVIEW SCOPE AND ANALYTICAL FRAMEWORK

This article adopts a critical narrative review approach supported by targeted synthesis of peer-reviewed studies, official Indian organic-sector statistics and international evidence. Priority was given to studies that report farm economics, income, net returns, profitability, certification effects, collective marketing, resource recycling or transition constraints. Indian evidence was emphasized because the objective is to explain farmer income under the country's institutional and agroecological conditions. International meta-analyses were used primarily to establish the broader relationships among yield, diversification, profitability and environmental performance.

The analytical framework treats farmer income as an outcome of interacting production and market variables. In simplified form, net farm income can be represented as: $\text{Net income} = (\text{physical output} \times \text{realized farm-gate price}) - \text{cash costs} - \text{imputed family labour} - \text{land and capital opportunity costs} - \text{certification and transaction costs}$. Organic management can influence every term in this expression. It may reduce fertilizer and pesticide expenditure, increase labour requirements, alter yields, create a premium, change the diversity of products sold and modify exposure to input-price volatility.

Figure 1 summarizes this framework. The key implication is that organic farming should be evaluated as a system of interacting mechanisms rather than through one indicator such as yield. The analysis also distinguishes between certified organic production, non-certified ecological production and integrated organic farming. These categories can

overlap in farm practice, but only certified production can reliably access many formal organic markets and therefore capture certification-related premiums.

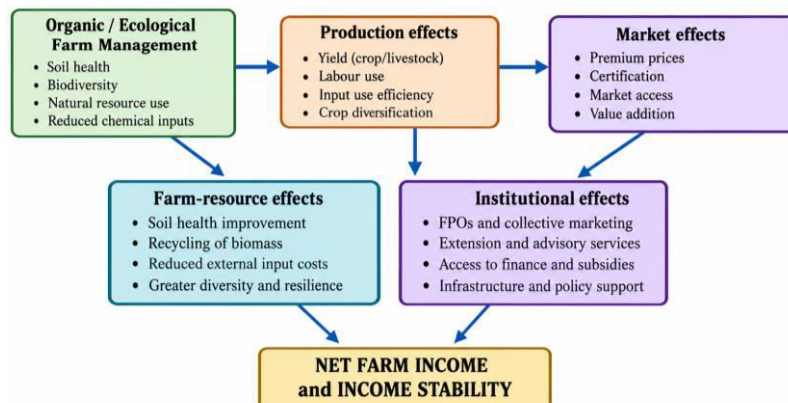


Figure.1. Conceptual pathway linking organic farming with farmer income

III. CURRENT STATUS OF ORGANIC FARMING IN INDIA

India's organic sector is supported by the National Programme for Organic Production (NPOP), implemented by APEDA under the Ministry of Commerce and Industry. NPOP establishes production standards, accreditation procedures, inspection and certification requirements, grower-group certification and the India Organic logo [12]. Its international recognition has helped Indian producers participate in export markets. The 2024–25 NPOP data provide a useful snapshot of the sector. Certified organic farm area was 2.254 million ha and the area in conversion was 1.714 million ha. Certified farm production was 4.391 million tonnes, while production from farms in conversion was approximately 0.309 million tonnes. Organic exports reached 368,155 tonnes, valued at ₹5,394.32 crore [7]. Cereals and millets represented the largest export category by volume, followed by processed food, oilseeds, sugar, medicinal plant products, spices, tea and coffee [7].

The geographical concentration of certification is also important for income policy. Madhya Pradesh, Maharashtra, Rajasthan and Gujarat together account for a large share of certified farm area, while Sikkim has a distinctive state-wide organic identity. Telangana and Andhra Pradesh have comparatively smaller certified areas but substantial conversion areas, indicating continuing transition potential [7]. Figure 2 shows the leading states by certified organic farm area. The national figures also reveal an important structural feature: grower groups dominate the number of farmers participating in NPOP. This is economically relevant because smallholders rarely possess the scale required to manage certification, aggregation, processing and marketing individually. Group certification and collective marketing are therefore not peripheral institutional arrangements; they are central to the commercial viability of organic agriculture in India. Selected indicators of India's certified are shown in the Table 1.

Table.1. Selected indicators of India's certified organic sector under NPOP, 2024–25[7]

Indicator	2024–25	Economic significance
Certified organic farm area	2,254,324 ha	Potential production base for differentiated markets
Area in conversion	1,713,714 ha	Large future pipeline but exposed to transition risk
Certified farm production	4,391,083 t	Commercial output available for sale
Organic exports	368,155 t	Evidence of external market demand
Export value	₹5,394.32 crore	Potential value capture from premium markets
Farmers in grower groups	2,184,807	Importance of collective certification and marketing
Processors	1,324	Scope for domestic value addition

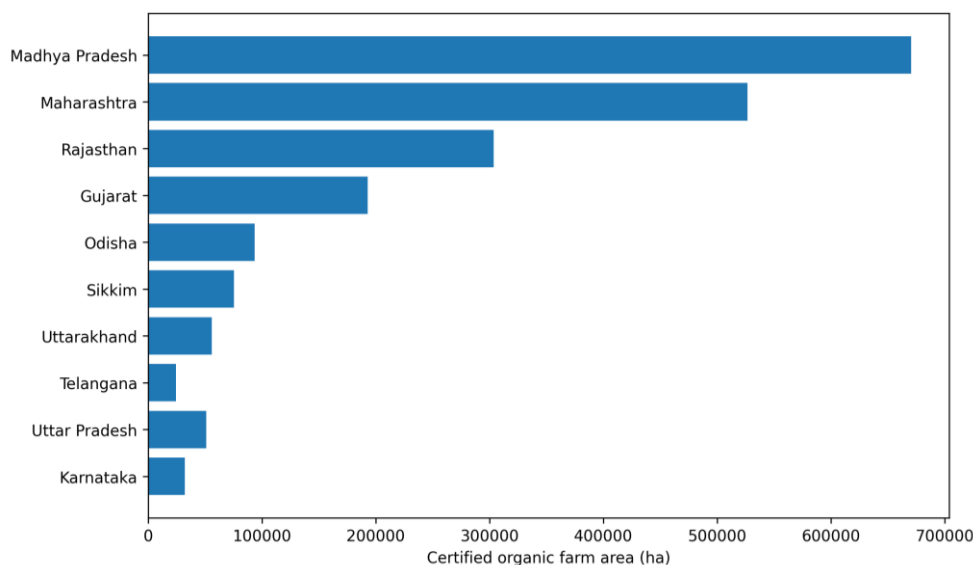


Figure.2. Leading Indian states by NPOP-certified organic farm area, 2024–25 [1]

IV. ORGANIC FARMING AND PRODUCTION ECONOMICS

4.1 Input-cost reduction

The most direct economic mechanism through which organic farming can increase income is reduction in expenditure on purchased fertilizers and pesticides. Organic systems can substitute farmyard manure, compost, crop residues, green manure, legumes, botanical preparations and biological control agents for part of the purchased input bundle. The advantage is strongest when these materials are produced on-farm or obtained locally at low opportunity cost. The importance of this mechanism is especially clear in diversified systems. Farm residues can become feed, bedding or compost; livestock manure can return nutrients to crop fields; crop by-products can support livestock; and water harvested in farm ponds can support high-value crops during dry periods. Thus, the economic value of organic farming may come from reducing purchases across the whole farm rather than from eliminating one chemical input at a time.

Nevertheless, lower cash expenditure should not be confused with lower economic cost. Compost preparation, weed control and biological pest management require labour, and family labour has an opportunity cost. Economic studies that report only cash expenditure can therefore overstate profitability. The pineapple study from northeastern India is an important warning: the system appeared profitable when perceived out-of-pocket costs were considered, but was often economically unviable after imputed costs were included [11].

4.2 Yield effects and the transition period

Yield is the most persistent concern in the economics of organic agriculture. Organic systems may initially face nutrient limitations, weed pressure and pest-management difficulties [13,14,15]. Organic systems may initially face nutrient limitations, weed pressure and pest-management difficulties. The magnitude of the yield difference is highly variable, however. Seufert et al. [2] reported lower organic yields on average, while Ponisio et al. [3] showed that diversification practices can substantially narrow the gap. These findings are particularly relevant to India because crop rotations, intercropping and mixed farming are already compatible with many smallholder systems.

The transition period is economically distinct from the mature organic system. Soil biological processes and nutrient cycling may take several seasons to stabilize, while certification and market recognition may lag behind production changes. Farmers with limited savings may therefore experience a temporary decline in income before any premium or cost advantage appears. A rational policy framework should treat transition as an investment period and provide targeted support rather than assuming that farmers can absorb the risk themselves. The economic threshold can be expressed conceptually as follows: organic production becomes attractive when the reduction in cash and resource costs plus any price premium and risk benefits exceeds the value of yield losses, additional labour and certification costs. This threshold differs among crops and regions. High-value horticultural crops with strong consumer demand may reach it more easily than low-value staple crops sold into undifferentiated markets.

V. EVIDENCE FROM INDIAN FARMING SYSTEMS

Indian evidence is heterogeneous, but several recurring patterns emerge. Integrated organic farming systems have demonstrated substantial potential for increasing income by combining crops, livestock, horticulture, fisheries, water harvesting and nutrient recycling. In a long-term integrated organic farming system in the northeastern hill region, Das et al. [16] demonstrated the potential of diversified farm components to increase resource recycling, employment and income. A later five-year study in Meghalaya similarly found that integrated organic models could supply much of their own nutrient requirements while improving productivity and livelihood outcomes [17]. The importance of integration is economically significant. A farm that relies on a single organic crop remains exposed to yield and price risk. By contrast, a farm producing cereals, vegetables, fruits, milk, eggs, fish or livestock products can spread risk over several enterprises. Manure from livestock reduces crop-input costs, while crop residues support livestock and compost production. Organic farming is therefore potentially most competitive when the farm operates as a circular production system.

Evidence from commodity-specific systems is less uniform. Certified black-pepper production in Kerala has been associated with income benefits, although the incremental effect of fair-trade participation was not identical to the effect of organic certification [10]. The finding demonstrates that market institutions matter: certification may improve access to buyers, but a second label or marketing arrangement does not automatically produce another proportional income gain.

The northeastern pineapple evidence is more cautionary. Paul et al. [11] found that growers often failed to recover full economic costs when family labour and other imputed expenditures were counted. This result is important because it challenges the assumption that low purchased-input expenditure is sufficient for profitability. It also illustrates the role of market structure: when growers have weak bargaining power and limited access to higher-value markets, the organic attribute alone may not generate enough additional revenue.

More recent evidence strengthens the case for resource-based organic management. Peddi et al. [18], using data from 900 millet farmers and an endogenous switching regression model, found that adoption of organic soil-fertility measures had a positive and statistically significant effect on farm profits. The estimated treatment effect suggests that appropriately designed soil-fertility practices can generate measurable economic gains in rainfed systems. The study is particularly relevant because it addresses selection bias rather than relying only on simple adopter–non-adopter comparisons.

Collective organization also appears to matter. Gurung et al. [19] examined 560 organic farming households in Sikkim and found that FPO members achieved higher annual net returns, return on investment and profit margins than comparable non-members after propensity-score matching. The estimated differences were approximately ₹7,254–8,133 in annual net returns, 4.6–4.8 percentage points in ROI and 8–8.4 percentage points in profit margin [19]. This provides direct evidence that institutional organization can influence organic-farm profitability. Recent evidence from Telangana highlights the other side of the problem. Swetha et al. [20] surveyed organic farmers and found certification and marketing constraints to be the most severe category of constraints, followed by economic and technological barriers. Initial yield loss during conversion ranked as the leading economic constraint, while high certification cost was the leading certification/marketing constraint. The highest-priority policy responses identified were transition support, simplified certification and improved marketing channels [20]. Evidence for the selected organic farming and farmer economics are shown in the Table 2.

Table.2. Selected Indian evidence on organic farming and farmer economics

Study	Location/system	Method/evidence	Main economic finding	Implication
Reddy et al. [9]	Pan-India	Farm/household survey	Economic effects vary by region and production system	Avoid universal profitability claims
Parvathi & Waibel [10]	Kerala; black pepper	Panel data; counterfactual analysis	Organic certification associated with income benefits	Certification can matter when linked to markets
Paul et al. [11]	Northeast; pineapple	Farm budgeting and long-run appraisal	Full economic costs often not recovered	Count family labour and improve marketing
Das et al. [16]	NE hill region; integrated organic	Long-term system assessment	Diversification and recycling improve income potential	Integrated systems can outperform single-enterprise models
Layek et al. [17]	Meghalaya; integrated organic	Five-year farm models	High on-farm nutrient recycling and improved livelihood potential	Resource integration reduces external-input dependence
Peddi et al. [18]	Rainfed millet regions	900 farms; endogenous switching regression	Organic soil-fertility adopters had higher profits	Resource-based practices can be economically effective
Gurung et al. [19]	Sikkim; organic households	560 farms; propensity-score matching	FPO membership increased net returns, ROI and margins	Collective action strengthens farm economics
Swetha et al. [20]	Telangana; organic farmers	120 farmers; Garrett/AHP	Certification, marketing and transition losses are major constraints	Policy must reduce transition and transaction costs

VI. ORGANIC PRICE PREMIUMS AND VALUE-CHAIN ECONOMICS

A price premium is often presented as the key mechanism that compensates organic farmers for lower yields or higher labour costs. Global evidence supports this logic: Crowder and Reganold [4] found that organic farming was generally more profitable when organic price premiums were included. However, the relevant variable for the farmer is not the retail organic premium but the additional price actually received at the farm gate after certification, aggregation, transport and marketing costs. This distinction is critical in India. Consumers may pay a substantial premium for packaged organic products in urban markets while farmers receive only a modest increase over conventional farm-gate prices. The difference represents value captured by processors, retailers and intermediaries. If farmers bear certification and production costs but cannot capture the downstream premium, organic conversion may not improve income.

Value addition is therefore a major opportunity. Processing turmeric into powder, millets into flour or ready-to-cook products, fruits into dried products, or oilseeds into cold-pressed oil can increase the value retained in rural areas. Packaging, grading, branding and traceability can further differentiate products. FPOs are particularly suited to these activities because they can aggregate sufficient volume to justify small-scale processing and negotiate with larger buyers. Export markets offer another opportunity. NPOP data show that the United States and European Union are major destinations for Indian organic products, while cereals and millets and processed foods account for substantial export volumes [7]. Export growth can create demand for higher-value products, but export orientation also requires consistent quality, certification, traceability, food-safety compliance and reliable aggregation. Consequently, export opportunity is not simply a matter of producing organic crops; it is a value-chain capability.

The most sustainable income strategy is therefore likely to combine certification with collective organization and value addition. Certification creates market identity; FPOs reduce transaction costs; processing captures value; and direct or contracted marketing improves price transmission. Each component reinforces the others.

VII. FARMER PRODUCER ORGANISATIONS AS AN INCOME MECHANISM

Small and fragmented landholdings are a structural constraint on Indian agriculture. Individual smallholders often lack bargaining power, have insufficient marketable surplus, and face high per-unit costs for transportation, certification and packaging. Organic production can intensify these problems because certification and identity preservation require additional coordination. FPOs can address these constraints through collective input procurement, group certification, aggregation, grading, storage, transport, processing and marketing. The Sikkim evidence from Gurung et al. [19] is particularly valuable because it moves beyond descriptive claims and estimates the income effect of FPO membership. The positive impact on net returns, ROI and profit margins suggests that collective organization can be treated as an economic intervention rather than merely a social institution.

However, FPO formation alone does not guarantee income improvement. An FPO without professional management, working capital, reliable buyers and processing infrastructure may simply add another administrative layer. Policy should therefore emphasize business viability, governance, market contracts, quality management and managerial capacity. Organic FPOs should be developed as value-chain enterprises rather than only as certification groups.

VIII. SOIL HEALTH, RESOURCE RECYCLING AND LONG-TERM FARM INCOME

Organic farming has an economic dimension that is not fully captured by annual crop budgets [21,22,23]. Repeated application of organic matter can improve soil structure, water retention and biological activity, while rotations and legumes can contribute to nutrient cycling. Long-term organic research has documented improvements in soil fertility and biodiversity under appropriate management [24]. These ecological changes may reduce future input requirements and improve resilience to drought and other climatic stresses.

The economic value of soil health is partly an avoided-cost benefit. A farmer does not receive an immediate market payment for increasing soil organic matter, but improved soil condition may reduce fertilizer requirements, improve water-use efficiency and stabilize yields. This is especially important in rainfed agriculture, where production risk is closely linked to soil moisture retention. Diversification further strengthens resilience. Ponisio et al. [3] found that multi-cropping and crop rotations reduce the organic-conventional yield gap. For Indian smallholders, diversification can simultaneously reduce yield risk, generate different harvest periods and provide biomass for livestock and compost. Thus, integrated organic systems may offer a more robust economic model than specialized organic monocultures.

IX. MAJOR CHALLENGES AFFECTING ORGANIC FARMER INCOME

- **Transition-period income loss:** Yield reductions can occur before soil and nutrient-management systems stabilize; smallholders have limited capacity to absorb temporary losses.
- **Certification and compliance cost:** Inspection, documentation and traceability can be costly relative to farm size; group certification can reduce transaction costs but requires strong organization.
- **Organic input availability:** Farmers without livestock or adequate biomass may need to purchase manure and biological inputs, reducing the cost advantage.
- **Labour requirements:** Manual weed control, composting and biological management may increase labour demand, and family labour has a real opportunity cost.
- **Weak price transmission:** Retail premiums do not automatically reach farmers; intermediaries and processors may capture a substantial share of value.
- **Quality and aggregation problems:** Small volumes, inconsistent grading and post-harvest losses reduce bargaining power and market access.
- **Limited technical extension:** Organic nutrient and pest management require knowledge-intensive practices; generic advice can lead to poor yields.
- **Credit and working capital:** Conversion, certification and processing require investment before premium markets are established.
- **Market volatility:** Organic markets are still smaller than conventional markets for many commodities, making demand and price realization uncertain.

- **Policy fragmentation:** Certification, organic production, FPOs, processing, exports and rural livelihoods are governed through different programmes and institutions.

X. OPPORTUNITIES FOR INCREASING ORGANIC FARMER INCOME

High-value crops provide one of the clearest opportunities. Spices, medicinal and aromatic plants, tea, coffee, fruits, vegetables, millets and specialty grains can obtain stronger differentiated-market prices than undifferentiated staple commodities. The NPOP export profile confirms the commercial importance of cereals and millets, processed food, medicinal plant products, spices, tea and coffee [6,7]. Domestic markets are equally important. Urban consumers increasingly seek traceable food, residue-conscious production and differentiated products. Direct farmer markets, community-supported agriculture, institutional procurement and digital commerce can shorten the value chain. The economic benefit will depend on trust, quality and reliable supply rather than simply attaching an organic label.

Processing offers another major opportunity. Instead of exporting or selling raw commodities, farmer organizations can undertake cleaning, grading, milling, drying, oil extraction and packaging. Such activities create rural employment and increase the proportion of final consumer value retained near the farm. Integrated crop–livestock systems can reduce dependence on purchased inputs. Livestock supplies manure and provides additional income, while crop residues can support animals and composting. Water harvesting, horticulture, fisheries and agroforestry can further diversify income. The integrated organic models documented in northeastern India illustrate the potential of this circular approach [16,17]. Digital traceability can strengthen the connection between farmer and consumer. QR-linked farm records, batch identification, certification information and transparent origin claims can reduce information asymmetry. The value of such systems will be greatest when digital tools are integrated with FPO aggregation and credible certification rather than used as marketing claims alone.

XI. POLICY PATHWAYS

- a. Transition support should be treated as an investment in structural change. Farmers converting to organic systems need temporary financial assistance, crop-specific technical guidance and access to suitable organic inputs. The recent Telangana evidence identifies transition-period yield loss as the leading economic constraint, reinforcing the importance of this intervention [20].
- b. Group certification should be strengthened. Because millions of farmers already participate through grower groups under NPOP [7], investment in internal control systems, digital records and local certification facilitation could lower per-farmer transaction costs.
- c. FPOs should receive business-oriented support. Working capital, aggregation centres, cold storage, processing equipment, branding and market contracts are more likely to improve farmer income than registration alone. The positive Sikkim evidence supports this direction [19].
- d. Local organic-resource infrastructure should be developed. Village-level composting, biomass recycling and bio-input production can convert locally available resources into productive inputs and reduce purchased-input dependence.
- e. Price realization should be measured at farm gate. Government programmes and research should track the proportion of consumer and retail premiums that reaches producers. Without this information, a large reported market premium may coexist with low farmer income.
- f. Agricultural research should report full economic costs. Organic farming trials should include paid labour, family labour, land rent, certification, transport, processing and marketing expenses. The pineapple study demonstrates why excluding imputed costs can produce misleading conclusions [11].
- g. Policy should prioritize diversified systems rather than universal monoculture conversion. Crop rotations, intercropping, livestock integration and water harvesting can reduce yield gaps and spread risk [3].
- h. Organic farming should be integrated with climate-resilient agriculture [25,26,27]. Soil organic matter, water conservation, biodiversity and diversified production have economic value through risk reduction even when these benefits are not immediately priced in markets.

XII. RESEARCH GAPS AND FUTURE DIRECTIONS

The literature has progressed considerably, but several methodological gaps remain [27,28]. First, many studies are cross-sectional and therefore cannot fully separate the effect of organic adoption from pre-existing differences between adopters and non-adopters. The use of propensity-score matching and endogenous switching regression in recent Indian studies is a positive development [18,19]. More longitudinal evidence is needed. Second, economic studies should

distinguish cash profitability from full economic profitability. Family labour, land opportunity cost and capital costs should be reported explicitly. Third, research should follow the product through the value chain so that farm-gate price realization can be compared with retail prices. Fourth, studies should measure income stability and downside risk, not only average annual returns.

Fifth, greater attention should be given to gender and labour distribution. Organic farming can create employment but may also increase unpaid household labour, particularly for women. Sixth, research should compare certification models and determine when certification costs are economically justified by actual premiums. Finally, more evidence is needed from eastern, central and southern India, where organic systems differ substantially from the better-studied Himalayan and northeastern cases. A useful future research design would combine farm surveys, panel data, value-chain tracing, soil measurements and quasi-experimental impact evaluation. Such an integrated approach could determine whether organic farming increases income because of lower costs, higher prices, diversification, better soil productivity, institutional participation or combinations of these mechanisms.

The most promising Indian model is therefore a value-chain-oriented organic enterprise. At the production end, the system should use locally available nutrients, diversified rotations and integrated crop–livestock components. At the institutional end, farmers should organize through FPOs and group certification. At the market end, aggregation, processing, branding and traceability should allow farmers to capture a greater share of the final value. At the policy end, temporary transition assistance and technical extension should reduce the risk of conversion. When these elements are aligned, the probability that organic production will translate into sustained farmer income becomes considerably higher. For policy, the implication is that organic agriculture should be targeted rather than universally prescribed [29,30,31]. Where farmers can access biomass, have suitable crops, participate in effective FPOs and sell into differentiated markets, organic production may be highly competitive. Where those conditions are absent, a gradual agroecological transition or integrated nutrient-management strategy may be economically safer than immediate full certification. The broader sustainability literature similarly emphasizes that agricultural systems should be evaluated according to local resource conditions, institutions and market structures rather than by a single ideological template [30].

The environmental benefits of organic management also have an economic dimension, although they are difficult to monetize [21,22,23]. Organic systems can support soil biological activity, biodiversity and reduced chemical exposure. Reviews have found biodiversity benefits under many organic management conditions [32,33], while broader assessments caution that environmental advantages can differ depending on whether impacts are measured per hectare or per unit of output [34]. This reinforces the need for a systems perspective: farmer income, environmental services and food production should be assessed together rather than assuming that one dimension automatically predicts the others.

A third distinction concerns risk. Conventional and organic farms may have similar expected returns but very different exposure to input-price volatility, pest outbreaks or market fluctuations. Organic farms that rely more heavily on farm-produced inputs may be less exposed to sudden fertilizer-price increases. Conversely, farms dependent on premium markets may be more exposed to demand fluctuations. Diversification can reduce this vulnerability [27,35] by distributing income across crops and enterprises. Future economic assessments should therefore include measures such as coefficient of variation of income, downside risk and income stability rather than reporting only average returns.

A second distinction is between farm-level profitability and household income. A diversified organic farm may generate moderate crop returns but substantially increase total household income through milk, poultry, fish, vegetables, processing or direct marketing [25,26,27]. Integrated organic farming systems are therefore better evaluated at the whole-farm level. Das et al. [16] and Layek et al. [17] demonstrate why resource recycling and multiple enterprises can change the economic performance of a farming system even when no individual crop is exceptionally profitable.

This distinction is especially important for Indian smallholders because many farms use family labour and locally available resources that do not appear as cash expenditure. When a farmer prepares compost using farm residues, feeds crop residues to livestock or performs manual weed control, the farm budget may show very little additional cash spending. Yet these activities consume time and labour that could have been used elsewhere. Economic studies should therefore report both cash profitability and full economic profitability. The latter should include family labour, land opportunity cost, capital and certification costs. The pineapple evidence illustrates how conclusions can change when imputed costs are included [11]. A central issue in the organic-farming debate is the tendency to use yield as a proxy

for economic success. For a commercial farmer, however, physical yield is only one component of income. A crop producing 2.0 tonnes per hectare at a high cost may generate less income than a crop producing 1.7 tonnes at a substantially lower cost. Likewise, a higher retail price does not necessarily mean a higher farmer price. The relevant measure is the net return retained by the producer after all economic costs and transaction costs are accounted for.

XIII. CONCLUSION

The evidence reviewed in this article does not support a simple conclusion that organic farming always increases farmer income in India. Instead, it supports a conditional proposition: organic farming is economically attractive when reductions in purchased-input costs, improvements in resource efficiency, diversification, price premiums and institutional support collectively outweigh yield reductions, additional labour, certification costs and transition risks. India's expanding certified organic sector demonstrates substantial market potential. Yet national production and export statistics do not by themselves establish farm-level profitability. The most convincing evidence for income improvement comes from diversified and integrated systems, effective organic soil-fertility management and collective organizations. Conversely, the evidence from organic pineapple and transition constraints illustrates that low cash expenditure can conceal economically important family labour and other costs.

The future policy objective should therefore shift from increasing the number of organic farmers to increasing the number of economically successful organic farming enterprises [25,26,27,28]. Transition support, credible group certification, FPO-based aggregation, processing, market linkage, digital traceability and evidence-based extension are central to this objective. Organic farming should be promoted where agroecological and market conditions are favourable, while farmers should not be exposed to uncompensated transition risks in the name of sustainability. In conclusion, organic farming can contribute meaningfully to Indian farmer income, but it is not a stand-alone technology. Its economic success depends on the entire system linking soil, crop, livestock, labour, certification, markets, institutions and consumers. The strongest pathway is therefore not organic production in isolation, but a diversified, resource-recycling and market-connected farming enterprise in which farmers retain a larger share of the value they create.

REFERENCES

1. Agricultural and Processed Food Products Export Development Authority. (2025). Organic certification data under NPOP 2024–25. Ministry of Commerce and Industry, Government of India.
2. Agricultural and Processed Food Products Export Development Authority. (2025). About organic products and National Programme for Organic Production (NPOP). Ministry of Commerce and Industry, Government of India.
3. Seufert, V., Ramankutty, N., & Foley, J. A. (2012). Comparing the yields of organic and conventional agriculture. *Nature*, 485, 229–232. <https://doi.org/10.1038/nature11069>.
4. Ponisio, L. C., M'Gonigle, L. K., Mace, K. C., Palomino, J., de Valpine, P., & Kremen, C. (2015). Diversification practices reduce organic to conventional yield gap. *Proceedings of the Royal Society B: Biological Sciences*, 282, 20141396. <https://doi.org/10.1098/rspb.2014.1396>.
5. Crowder, D. W., & Reganold, J. P. (2015). Financial competitiveness of organic agriculture on a global scale. *Proceedings of the National Academy of Sciences*, 112(24), 7611–7616. <https://doi.org/10.1073/pnas.1423674112>.
6. Seufert, V., & Ramankutty, N. (2017). Many shades of gray—The context-dependent performance of organic agriculture. *Science Advances*, 3(3), e1602638. <https://doi.org/10.1126/sciadv.1602638>.
7. Reddy, A. A., Melts, I., Mohan, G., Rani, C. R., Pawar, V., Singh, V., Choubey, M., Vashishtha, T., Suresh, A., & Bhattarai, M. (2022). Economic impact of organic agriculture: Evidence from a pan-India survey. *Sustainability*, 14(22), 15057. <https://doi.org/10.3390/su142215057>.
8. Parvathi, P., & Waibel, H. (2016). Organic agriculture and fair trade: A happy marriage? A case study of certified smallholder black pepper farmers in India. *World Development*, 77, 206–220. <https://doi.org/10.1016/j.worlddev.2015.08.027>.
9. Paul, U. K., Das, G., Ray, A., & Mathur, T. (2017). Is the organic system economically viable? The case of pineapple in India's Northeast. *International Journal of Fruit Science*, 17(3), 269–279. <https://doi.org/10.1080/15538362.2016.1276507>.
10. Das, A., Layek, J., Ramkrushna, G. I., Babu, S., Devi, M. T., Dey, U., Suting, D., Yadav, G. S., Lyngdoh, D. B. D., & Prakash, N. (2019). Integrated organic farming system: An innovative approach for enhancing productivity and income of farmers in north eastern hill region of India. *Indian Journal of Agricultural Sciences*, 89(8), 1267–1272. <https://doi.org/10.56093/ijas.v89i8.92843>.

11. Layek, J., Das, A., Ansari, M. A., Mishra, V. K., Rangappa, K., Ravisankar, N., Patra, S., Baiswar, P., Ramesh, T., Hazarika, S., Panwar, A. S., Devi, S., Ansari, M. H., & Paramanik, B. (2023). An integrated organic farming system: Innovations for farm diversification, sustainability, and livelihood improvement of hill farmers. *Frontiers in Sustainable Food Systems*, 7, 1151113. <https://doi.org/10.3389/fsufs.2023.1151113>.
12. Peddi, D., Reddy, B. S., & Revathi, E. (2025). Adoption of organic soil fertility measures and their impact on farm outcomes: A case study of millet cultivators in India. *Journal of the Asia Pacific Economy*, 30(4), 1486–1505. <https://doi.org/10.1080/13547860.2024.2378530>.
13. Gurung, R., Choubey, M., & Rai, R. (2024). Economic impact of farmer producer organisation membership: Empirical evidence from India. *International Journal of Social Economics*, 51(8), 1015–1028. <https://doi.org/10.1108/IJSE-06-2023-0451>.
14. Swetha, B., Barua, S., Joshi, P., Saurav, S. K., & Chaitanya, N. V. L. K. (2026). Adoption constraints and strategic priorities for promoting organic farming in Telangana: A Garrett ranking and analytical hierarchy process approach. *Journal of Scientific Research and Reports*, 32(7), 381–390. <https://doi.org/10.9734/jsrr/2026/v32i74315>.
15. Mäder, P., Fliessbach, A., Dubois, D., Gunst, L., Fried, P., & Niggli, U. (2002). Soil fertility and biodiversity in organic farming. *Science*, 296(5573), 1694–1697. <https://doi.org/10.1126/science.1071148>.
16. Bengtsson, J., Ahnström, J., & Weibull, A.-C. (2005). The effects of organic agriculture on biodiversity and abundance: A meta-analysis. *Journal of Applied Ecology*, 42(2), 261–269. <https://doi.org/10.1111/j.1365-2664.2005.01005.x>.
17. Pimentel, D., Hepperly, P., Hanson, J., Douds, D., & Seidel, R. (2005). Environmental, energetic, and economic comparisons of organic and conventional farming systems. *BioScience*, 55(7), 573–582. [https://doi.org/10.1641/0006-3568\(2005\)055\[0573:EEAECO\]2.0.CO;2](https://doi.org/10.1641/0006-3568(2005)055[0573:EEAECO]2.0.CO;2).
18. Reganold, J. P., & Wachter, J. M. (2016). Organic agriculture in the twenty-first century. *Nature Plants*, 2, 15221. <https://doi.org/10.1038/nplants.2015.221>.
19. Meemken, E.-M., & Qaim, M. (2018). Organic agriculture, food security, and the environment. *Annual Review of Resource Economics*, 10, 39–63. <https://doi.org/10.1146/annurev-resource-100517-023252>.
20. Tuomisto, H. L., Hodge, I. D., Riordan, P., & Macdonald, D. W. (2012). Does organic farming reduce environmental impacts? A meta-analysis of European research. *Journal of Environmental Management*, 112, 309–320. <https://doi.org/10.1016/j.jenvman.2012.08.018>.
21. Tuck, S. L., Winqvist, C., Mota, F., Ahnström, J., Turnbull, L. A., & Bengtsson, J. (2014). Land-use intensity and the effects of organic farming on biodiversity: A hierarchical meta-analysis. *Journal of Applied Ecology*, 51(3), 746–755. <https://doi.org/10.1111/1365-2664.12219>.
22. Hole, D. G., Perkins, A. J., Wilson, J. D., Alexander, I. H., Grice, P. V., & Evans, A. D. (2005). Does organic farming benefit biodiversity? *Biological Conservation*, 122(1), 113–130. <https://doi.org/10.1016/j.biocon.2004.07.018>.
23. Willer, H., Schlatter, B., Trávníček, J., Kemper, L., & Lernoud, J. (Eds.). (2024). *The world of organic agriculture: Statistics and emerging trends 2024*. Research Institute of Organic Agriculture FiBL & IFOAM Organics International.
24. Läpple, D., & Kelley, H. (2013). Understanding the uptake of organic farming: Accounting for heterogeneities among Irish farmers. *Land Use Policy*, 33, 155–164. <https://doi.org/10.1016/j.landusepol.2012.12.02>.
25. Pretty, J. (2006). *Agri-culture: Reconnecting people, land and nature*. Earthscan.
26. Pretty, J., Toulmin, C., & Williams, S. (2011). Sustainable intensification in African agriculture. *International Journal of Agricultural Sustainability*, 9(1), 5–24. <https://doi.org/10.3763/ijas.2010.0583>.
27. Tilman, D., Cassman, K. G., Matson, P. A., Naylor, R., & Polasky, S. (2002). Agricultural sustainability and intensive production practices. *Nature*, 418, 671–677. <https://doi.org/10.1038/nature01014>.
28. Panneerselvam, P., Hermansen, J. E., & Halberg, N. (2011). Food security of smallholding farmers: Comparing organic and conventional systems in India. *Journal of Sustainable Agriculture*, 35(3), 254–274.
29. Eyhorn, F., Ramakrishnan, M., & Mäder, P. (2007). The viability of cotton-based organic farming systems in India. *International Journal of Agricultural Sustainability*, 5(1), 25–37.
30. Parrott, N., & Marsden, T. (2002). *The real green revolution: Organic and agroecological farming in the South*. Greenpeace Environmental Trust.
31. Niggli, U., Slabe, A., Schmid, O., Halberg, N., & Schlüter, M. (2008). Vision for an organic food and farming research agenda to 2025. IFOAM.
32. Pretty, J., Benton, T. G., Bharucha, Z. P., Dicks, L. V., Flora, C. B., Godfray, H. C. J., Goulson, D., Hartley, S., Lampkin, N., Morris, C., Pierzynski, G., Prasad, P. V. V., Reganold, J., Rockström, J., Smith, P., Thorne, P., & Wratten, S. (2018). Global assessment of agricultural system redesign for sustainable intensification. *Nature Sustainability*, 1, 441–446. <https://doi.org/10.1038/s41893-018-0114-0>.

33. Rigby, D., & Cáceres, D. (2001). Organic farming and the sustainability of agricultural systems. *Agricultural Systems*, 68(1), 21–40. [https://doi.org/10.1016/S0308-521X\(00\)00060-3](https://doi.org/10.1016/S0308-521X(00)00060-3).
34. Badgley, C., Moghtader, J., Quintero, E., Zakem, E., Chappell, M. J., Avilés-Vázquez, K., Samulon, A., & Perfecto, I. (2007). Organic agriculture and the global food supply. *Renewable Agriculture and Food Systems*, 22(2), 86–108. <https://doi.org/10.1079/RAF200695>.
35. Agricultural and Processed Food Products Export Development Authority. (2024). Organic certification data under NPOP 2023–24. Ministry of Commerce and Industry, Government of India.



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