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COMMENTARY

Organic Farming in India: Catalysts that Can Help in Transition

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Abstract: Organic farming has been receiving policy support from both the central and state governments in India since 2005. The shift in policy thrust from conventional chemical-input based farming to organic farming comes as a response to the sustainability concerns surrounding Indian agriculture. Despite this, organic farming remains niche, with less than 2% of the net sown area in the country under organic production. This paper suggests market-based instruments—which have been successful in inducing changes in farming practices in some countries across the globe—as complementary policy mechanisms for catalysing the transition to organic farming in India.

Keywords: Organic Farming; Economic Incentives; Market based Instruments; PES; Sustainability.

1. INTRODUCTION

The Economics Nobel Prize (2017) winner Richard H. Thaler's work demonstrates that individuals often behave irrationally but can be "nudged" towards rational outcomes. His insight has significant implications for farmer behaviour, agricultural policy, and larger environmental outcomes, especially in developing economies.

Agricultural policy in India has come a full circle, with a shift in emphasis from seed–fertilizer technologies in the early 1960s to eco-friendly nature-

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based organic farming technologies around 2005. Agriculture is a business with nature. However, the nature and intensification of the agriculture pursued have significant environmental, social, and economic impacts (Ahlem and Hammas 2017). Chemical input dependent conventional agricultural practices like seed–fertilizer technologies impose huge environmental costs in the long run (Pingali 2012). This results in negative externalities like the degradation of natural resources, pollution, desertification, and adverse public health outcomes. Organic farming, with its emphasis on stewardship of natural resources, gains significance in this context. Recognizing this, the Ministry of Agriculture developed the first national-level Organic Farming Policy in 2005 (GoI 2005). However, concerted efforts to promote organic farming were only initiated a decade later under the aegis of the National Mission of Sustainable Agriculture (Khurana and Kumar 2020).

The policy thrust for organic farming can be seen as a response to the sustainability concerns surrounding Indian agriculture. Organic farming has its roots in traditional agricultural practices, which align with the Indian philosophy of sustainability and an eco-centric management approach. Organic production techniques conserve natural resources and biodiversity and contribute to reducing the agriculture sector's energy and water footprints (Khan and Hanjra 2008). Empirical evidence has established a link between organic farming and ecosystem services (Sandhu *et al.* 2020). Organic production systems also contribute to achieving sustainable development (Ahlem and Hammas 2017; Setboonsarng and Gregorio 2017). They capitalize on the comparative advantages of resource-poor farmers located in pristine, remote locations that are naturally predisposed towards organic cultivation; harness traditional knowledge; and foster gender equality by creating meaningful work (Yekinni *et al.* 2019).

This paper discusses the provisions under the current national- and state-level organic policies and programmes. It then explores the potential for using monetary incentives like agri-environmental schemes (AES) and payment for ecosystem services (PES) to compensate for the revenue loss from transitioning to organic farming in categories II and III priority areas identified in the national policy. Finally, the paper details mechanisms for operationalizing the incentive mechanism.

2. CHALLENGES IN TRANSITIONING TO ORGANIC PRODUCTION

In addition to the national-level organic policy (GoI 2005), several states in India have formulated state-specific policies and strategies to shift to organic production. Sikkim has pioneered this effort and was declared the first "fully organic" state in the world. The reach of the Green Revolution was historically limited in the eastern and north-eastern states; hence, traditional farming practices have continued to flourish in these regions. The policy documents from the Organic Farming Policy, 2005, and those of the states, outline the institutional, technological, input, and certification support extended to promote organic farming. Some specific measures include group certification; participatory guarantee systems (PGS); demarcation of organic clusters in tribal, hilly, and rainfed regions; introduction of a holistic framework for the overall organic sector covering aspects of production, marketing, and trade; coordination of various programmes for the promotion of organic farming; and making TraceNet—the electronic process certification platform—flexible and open access (GoI 2019).

India has the largest number of organic producers in the world and ranks ninth in terms of its area of agricultural land under organic cultivation (PIB 2020). However, a mere 2.78 million hectares, which is roughly about 2% of the net sown area, is being used for organic farming in India (Khurana and Kumar 2020). India is the second-largest exporter of organic products in Asia, but its export volume comprises just about 0.55% of the global trade in organic produce (GoI 2019). Thus, organic farming continues to remain a niche area despite the available policy support. Conversion to an organic production system is especially challenging for farmers in categories II and III priority zones (GoI 2005). These are areas with moderate to high levels of chemical input–based agriculture systems; converting to organic production systems would entail productivity and revenue loss in the short run in these places (de Ponti *et al.* 2012). This is the private cost that individual farmers bear for realizing the larger social benefits of organic production.

3. THE ROLE OF MARKET-BASED INSTRUMENTS

The private cost borne by cultivators shifting to organic production systems in priority zones illustrates a case of market failure due to externalities. A shift to organic production generates a wide range of non-excludable ecosystem services, which are positive externalities. These include better ecosystem services (low pesticide and chemical fertilizer load on the

environment and in food) that benefit society. In the absence of a market for these ecosystem services, farmers do not get any monetary benefits for generating these services. In this context, the provision of monetary incentives to compensate for private economic loss upon conversion to organic production systems gains significance as a policy instrument in these transition zones. However, farmers are expected to sustain organic systems despite a probable fall in output in the short term.

Policy mechanisms like PES and AES could compensate farmers for adopting organic techniques that generate improved ecosystem services. AES has been used as a market-based policy instrument in the European Union (EU), USA, and Australia since the early 1990s to reduce the environmental risks associated with input-intensive farming and to preserve natural and cultivated landscapes (de Krom 2017; SEP 2017; Kuhfuss *et al.* 2016). AES establishes contracts between governments and farmers that guarantee annual payments to farmers who enrol in the scheme. It covers the average compliance cost and foregone farming revenue consequent to the adoption of environmentally benign farming practices (Kuhfuss *et al.* 2016). PES payments generally cover ecosystem services, while AES payments are directed towards changing farming practices. But when farming systems and practices are modified to protect and ensure ecosystem service flow, the distinction between the two disappears (Ottaviani 2010).

To date, there is no PES scheme that is implemented directly for agriculture.[1] Even those schemes that are strongly related to agriculture are classified as targeting water, carbon sequestration, and biodiversity. In most of these schemes, farming practices are modified; this serves as an entry point for controlling soil erosion, improving carbon sequestration, and maintaining water quality and biodiversity. Successful PES models exist in Indonesia, Tanzania, and Nepal, where farming systems and practices are used as entry points to achieve ecological benefits (Ottaviani 2010). The potential for using PES to double farmers' incomes by getting them to shift to ecosystem service generating, environmentally friendly farming practices has also been explored in the Indian context[2] (Devi *et al.* 2017; Kumar *et al.* 2019; Manjula *et al.* 2019).

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[1] The Paramparagat Krishi Vikas Yojana and the Mission Organic Value Chain Development for North Eastern Region offers financial assistance to farmers. However, this incentive goes towards input support, capacity-building, certification, and collectivization. It is not designed for generating non-market ecosystem services from organic farming.

[2] The study estimated potential PES payments for different scenarios of transition to ecologically sensitive agricultural practices. Three desired outcomes proposed are increased carbon sequestration in soil, reduced water usage, and lower toxic residuals in the soil. Farmers could choose all three outcomes (full adoption scenario), a combination of two

As incentive-based mechanisms, both AES and PES promote voluntary payments for rent and revenue foregone due to low-input agricultural practices. Thus, PES and AES potentially provide bridges for the adoption of environmentally sustainable agricultural practices. Under World Trade Organization (WTO) regulations, AES and PES qualify as green box subsidy measures for agriculture. Currently, the policy environment in India is conducive to the introduction of market-based policy instruments in line with AES/PES. India's National Environment Policy, 2006, proposed to introduce market-based instruments (MBIs) for environmental management (MoEF 2006). PES-based benefit-sharing schemes are already operational in the Sukhomajri watershed in Haryana and the Bohal spring catchment area in Himachal Pradesh (Kerr 2002; Dash 2019). In Sukhomajri, the PES component provides additional incentives for landless and marginal farmers to abandon free grazing and tree-felling practices in watershed areas. In Himachal Pradesh, the agreement was between the Village Forest Development Society and the Palampur Municipal Corporation. The PES was implemented to ensure a sustainable supply of water and the protection of the catchment area of the Bohal spring, which is managed by local communities living in the nearby Bheemi forest. Similar market-based instruments could be established for incentivizing the transition to socially beneficial, environmentally friendly organic farming practices, at minimal or no private cost to the farmer.

4. OPERATIONALIZING A MARKET-BASED INCENTIVE MECHANISM

The challenge in operationalizing AES/PES mechanisms can be institutional, technological, and behavioural. Agro-ecologies should be the basic planning units on which cropping patterns and management protocols are decided. The conversion should happen in a phased manner. Switching to organic farming often results in an initial decline in output, which eventually recovers. The extent of decline, and the time required to regain the original/higher level of productivity, varies depending on the crop and climate and soil, agronomic, and management factors. Analysing a meta-dataset of 362 published organic–conventional comparative crop yields

(medium adoption scenario), or any one of them (low adoption scenario). Depending on the scenario adopted, the farmer would be given 100%, 70%, or 30% of the PES payment. The payment, which is for non-market ecosystem services, will supplement their annual income from agriculture. The per hectare PES estimate is derived based on the value of non-market ecosystem services from croplands provided in The Economics of Ecosystem and Biodiversity (TEEB) database. The authors' estimation shows that in the high and medium adoption scenarios, the PES mechanism helps to almost double farmers' income.

showed a wide variation in yield across crops and geographies (de Ponti *et al* . 2012). The average yield reduction in the switch from intensive farming to organic is around 10–15%; meanwhile, in traditional rainfed agriculture, organic farming has the potential to increase the yield. Similarly, a study by Indian Council of Agricultural Research (ICAR) that examined yield across 12 states showed that the organic yield of some vegetables, spices, etc. increased by 5–20% as compared to the inorganic yield. However, a 5–20% yield reduction was observed in the case of rice, certain vegetables, and groundnut (Khurana and Kumar 2020). Cropping systems that input sufficient organic nutrients reported at least a 10–20% increase in the organic carbon content of the soil. Evidently, there are contrasting claims concerning the initial yield dip/spike during a transition to organic farming systems. As such, it is important to assess the realistic yield gaps (if any) consequent to conversion and the time required for the yield to stabilize or improve for different crops/cropping systems. Scientific estimations of yield gaps and the time taken for yield stabilization should form the basis for deciding the quantity and schedule of payments.

While yield figures are important, changes in farm income are also determined by the prices that farmers charge. Yields are sometimes compensated by higher prices; the results of a study by Devi (2018) highlight this aspect. For example, the average yield of banana (*nendran* variety) from an organic field in Kerala was 13% lower, but it fetched a 20% higher price, leading to a 33% increase in income. In the case of organic coconut production, the income advantage was around 43%, as production was export oriented. The advantage was a modest 2% in organic black pepper farming. The average yield of organic rice was only 2.077 t/ha against 2.625 t/ha from conventional farms, which is 21% less; however, the price premium was not enough to offset this yield gap and the returns were reduced by 6% (Devi 2018). Thus, incentives need to align with the cropping/farming systems, location, yield, and income patterns.

The field-level assessment of these aspects could be linked to the existing system under the Commission for Agricultural Cost and Prices (CACP), which engages in regular field data collection. Further, a national system for estimating the value of ecosystem services (NSEVES) must be formed to regularly assess the value of ecosystem services from organic systems. This system, like the System of National Accounts, can assist in the estimation of the green gross domestic product (GDP) as well, through the generation of data on net ecosystem service changes and their value. Alternately, the methodology from Kumar *et al* . (2019) (detailed in Footnote 2) could be adopted to arrive at the per hectare value of non-market ecosystem services

from organic farming, and the rupee value of the ecological incentive to be paid out as PES to organic farmers.

The financial base for AES/PES could be pooled from various stakeholders who derive direct/indirect service benefits from the agriculture sector. This includes industries that depend on agricultural produce for raw materials and trade; consumers of organic products; and sectors that use agricultural biodiversity (for instance, the benefits from the gene fund and access and benefit sharing structures). The demand for organic products is influenced by age and income levels, and the price difference ranges between 50–150% depending upon the vegetable (Devi 2018). A fixed proportion of the profit that traders earn can be diverted to the fund. Funds allocated for climate-smart agriculture (CSA) can also be sources of financial support. Budgetary provisions for the promotion of organic farming could also be channelized for this. Budgetary allocation for the scheme should be shared between state and central governments. Scheme implementation could be the responsibility of state governments.

The model set by the Government of Kerala in launching a scheme for royalty payments to rice paddy farmers since September 2020 is one initiative which can be emulated. An amount of ₹ 2,000 per hectare is extended to owners of 2.05 lakh hectares of paddy land in the state. Furthermore, ₹ 40 crore has been earmarked for this in the 2020–21 budget for integrated rice development.

5. CONCLUSION

The central and state governments have implemented a host of measures to encourage organic farming in India. However, they have had a limited impact on the area under organic cultivation. Market-based instruments are suggested as complementary policy mechanisms to encourage large-scale adoption of organic farming in India. These instruments are to be introduced in addition to the measures implemented to overcome technological and institutional constraints in the large-scale conversion to organic cultivation. Funds for implementing this scheme could be pooled from various stakeholders who derive direct/indirect service benefits from the agriculture sector. Market-based instruments have been successfully implemented across the globe to encourage the adoption of environmentally friendly farming practices. India could do well to emulate these successes.

REFERENCES

Ahlem, Z., and M. A. Hammas. 2017. "Organic Farming: A Path of Sustainable Development." *International Journal of Economics and Management Sciences* 6: 5. https://doi.org/10.4172/2162-6359.1000456.

Dash, A. 2019. "Payment for Ecosystem Services: Palampur in Himachal has a Model in Place." *Down to Earth*, July 30, 2019. https://www.downtoearth.org.in/news/environment/payment-for-ecosystem-services-palampur-in-himachal-has-a-model-in-place-65908.

de Krom, M. P. M. M. 2017. "Farmer Participation in Agri-environmental Schemes: Regionalisation and the Role of Bridging Social Capital." *Land Use Policy* 60: 352–361. https://doi.org/10.1016/j.landusepol.2016.10.026.

de Ponti, T., B. R., and M. K. van Ittersum. 2012. "The Crop Yield Gap Between Organic and Conventional Agriculture." *Agricultural Systems* 108: 1–9. https://doi.org/10.1016/j.agsy.2011.12.004.

Devi, P. I., L. Kumar, D. S. Kumar, M. Manjula, P. Mukhopadhyay, P. Raghu, Devinder Sharma, R. Sridhar, and L. Venkatachalam. 2017. "Payment for Ecosystem Services: Guaranteed Farm Income and Sustainable Agriculture." *Economic & Political Weekly* 52 (17): 12-14.

Devi, P. I.. Forthcoming. "Organic Farming in Kerala: Field Realities and Strategies for Future". Thiruvananthapuram: Government of Kerala, Directorate of Environment and Climate Change.

Ferraro, P. J., and M. K. Price. 2013. "Using Non-pecuniary Strategies to Influence Behavior: Evidence from a Large Scale Field Experiment." *The Review of Economics and Statistics* 95 (1): 64–73. https://doi.org/10.1162/REST_a_00344

Government of India. 2005. "Organic Farming Policy 2005." New Delhi: Ministry of Agriculture, Department of Agriculture & Cooperation. https://ncof.dacnet.nic.in/Policy_and_EFC/Organic_Farming_Policy_2005.pdf.

Government of India. 2019. "Export of Organic Products: Challenges and Opportunities." Report No. 150. New Delhi: Rajya Sabha Secretariat. https://rajyasabha.nic.in/rsnew/Committee_site/Committee_File/ReportFile/13/120/150_2019_12_12.pdf.

Kerr, J. 2002. "Sharing the Benefits of Watershed Management in Sukhomajri, India." In *Selling Forest Environmental Services: Market-based Mechanisms for Conservation and Development*, edited by Stefano Pagiola, Joshua Bishop, and Natasha Landell-Mills, 327–343. London: Earthscan.

Khan, S., and M. A. Hanjra. 2008. "Footprints of Water and Energy Inputs in Food Production – Global Perspectives." *Food Policy* 34 (2): 130–140. https://doi.org/10.1016/j.foodpol.2008.09.001.

Khurana, A. and V. Kumar. 2020. "State of Organic and Natural Farming: Challenges and Possibilities." New Delhi: Centre for Science and Environment. https://www.cseindia.org/state-of-organic-and-natural-farming-in-india-10346.

Kuhfuss, L., R. Préget, S. Thoyer, and N. Hanley. 2016. "Nudging Farmers to Enrol Land into Agri-environmental Schemes: The Role of a Collective Bonus." *European Review of Agricultural Economics* 43 (4): 609–636. https://doi.org/10.1093/erae/jbv031.

Kumar, L., M. Manjula, R. Bhatta, L. Venkatachalam, D. S. Kumar, P. I. Devi, and P. Mukhopadhyay. 2019. "Doubling India's Farm Incomes: Paying Farmers for Ecosystem Services, Not Just Crops." *Economic and Political Weekly* 54 (23): 43-49.

Manjula, M., L. Venkatachalam, P. Mukhopadhyay, and L. Kumar. 2019. "Ecosystems Service Approach for Revitalizing Agriculture in India." *Current Science* 116 (5): 723–727. https://doi.org/10.18520/cs/v116/i5/723-727.

MoEF. 2006. "National Environmental Policy." New Delhi: Ministry of Environment and Forests. https://ibkp.dbtindia.gov.in/DBT_Content_Test/CMS/Guidelines/20190411103521431_National%20Environment%20Policy,%202006.pdf

Ottaviani, D. 2010. *The Role of PES in Agriculture*. Rome: Food and Agricultural Organisation. http://www.fao.org/3/i2100e/i2100e01.pdf.

Pingali, P. L. 2012. "Green Revolution: Impacts, Limits, and the Path Ahead." *Proceedings of the National Academy of Sciences of the United States of America* 109 (31): 12302–12308. https://doi.org/10.1073/pnas.0912953109.

Press Information Bureau (PIB). 2020. "Organic Food for Health and Nutrition #Atma Nirbhar Krishi." New Delhi: Press Information Bureau. https://pib.gov.in/PressReleasePage.aspx?PRID=1645497.

Sandhu H. S., S. D. Wratten, and R. Cullen. 2020. "Organic Agriculture and Ecosystem Services." *Environmental Science & Policy* 13 (1): 1–7. https://doi.org/10.1016/j.envsci.2009.11.002.

SEP. 2017. "Agri-environmental Schemes: How to Enhance the Agriculture–Environment Relationship." *Science for Environment Policy* 57: 5–7. https://ec.europa.eu/environment/integration/research/newsalert/pdf/AES_impacts_on_agricultural_environment_57si_en.pdf.

Setboonsarng, S., and E. E. Gregorio. 2017. "Achieving Sustainable Development Goals Through Organic Agriculture: Empowering Poor Women to Build the Future." *South East Asia Working Paper Series*, WPS179123–2. http://dx.doi.org/10.22617/WPS179123-2.

Yekinni O.T, T. O. Bamidele, and T. A. Ladigbolu. 2019. "Gender Dimension to Organic Agriculture Involvement in Southwest Nigeria." *African Journal of Organic Agriculture and Ecology* 1: 45–50. https://noara.bio/wp-content/uploads/2019/09/7.-Gender-Dimension-to-Organic-Agriculture-Involvement-in.pdf