

Chapter 1. Overview, policy recommendations and conclusions

This chapter presents an overview of the performance of the agricultural and food policies currently applied in India based on the analysis conducted within this review and sets out the possible changes that will make the overall policy set “fit for purpose”; that is, a policy set capable of providing the institutions and incentives that the sector needs to meet the challenges briefly outlined below.

1.1. Overview

Setting the scene: Economic, social and environmental context

India is a country of enormous diversity – geographic, economic and ethnic – that has made remarkable economic and social progress since the start of liberalisation reforms in the early 1990s. It is the seventh largest country by land area (2.97 million km²) and the second most populous after China with over 1.3 billion people, accounting for 18% of the world's population. However, at just 0.15 ha per capita, agricultural land is very scarce. While the level of urbanisation increased from 27.8% to 31.1% over the past decade, two thirds of the population still live in rural areas (World Bank WDI, 2018).

Sustained reforms contributed to a much improved macroeconomic environment

Economic growth of around 7% over the last 5 years makes India one of the fastest-growing emerging economies (Box 1.1). The acceleration of structural reforms and low commodity prices since 2014 have boosted economic activity in India and improved the external current account position. In addition, continued fiscal consolidation, by reducing government deficits and debt accumulation, and an anti-inflationary monetary policy stance have helped consolidate macroeconomic stability (OECD, 2017a).

Important steps have also been taken to make India a less fragmented domestic market. In July 2017, the Goods and Services Tax (GST) reform – in the making for over a decade – came into force. The GST replaced various taxes on goods and services levied previously by the central government and states by a single tax on value added, with the potential to enhance the efficiency of production and movement of goods and services between Indian states. Nonetheless, implementation challenges remain, stemming from the different tax rates applied across product categories, exclusion of certain products, and other administrative complexities related to registration and payment.

Strong economic performance lifted millions of people out of extreme poverty

Strong growth since the mid-1990s has raised GDP per capita by over 5% per year and contributed to a substantial reduction in poverty incidence, from 45% in 1993 to 22% in 2011, measured at the national poverty line, as well as a reduction in the absolute number of people experiencing poverty.

While the overall share of the urban population remains low compared to countries at a similar level of development, demographic change will be an important factor driving the Indian economy in the long run: in 2020, the estimated average age of India's population at around 29 years is expected to be among the lowest in the world. Supported by the strong economic growth, the share of the middle class in total population and overall consumption has been increasing rapidly. Existing projections suggest that if India continues its growth path, the middle class could reach more than two thirds of the population towards the end of the following decade¹ (Brookings Institution, 2015). However, demographic dynamics have been insufficiently matched so far by job creation due to remaining structural bottlenecks in the labour and goods markets.

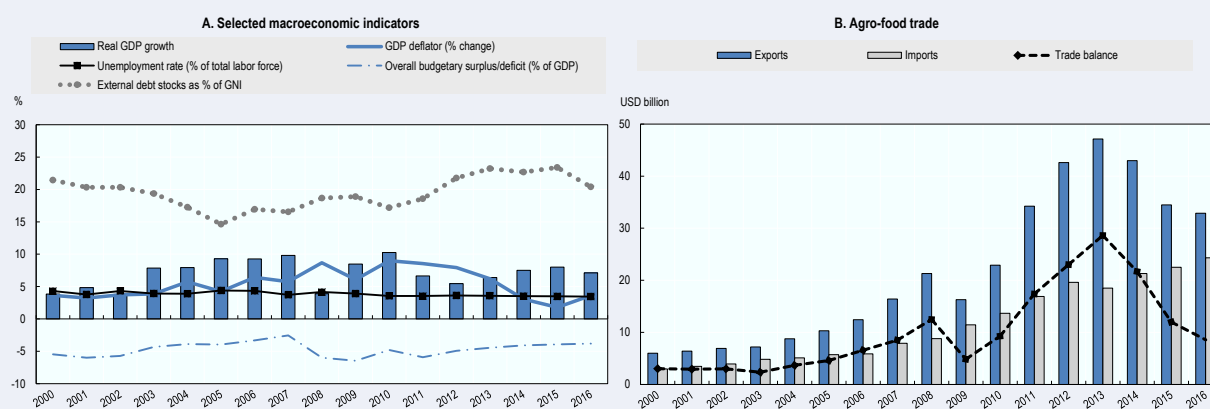
Box 1.1. India: Agriculture in context**Table 1.1. Contextual indicators, 1995-2016**

	1995	2016 ¹
Economic context		
GDP (billion USD in PPPs)	1 426	8 703
Population (million)	960	1 324
Land area (thousand km ²)	2 973	2 973
Agricultural area (AA) (thousand ha)	180 945	179 600
Population density (inhabitants/km ²)	323	445
GDP per capita (USD in PPPs)	1 485	6 572
Trade as % of GDP ²	19	27
Agriculture in the economy		
Agriculture in GDP (%)	27	17
Agriculture share in employment (%)	61	47
Agro-food exports (% of total exports)	20	13
Agro-food imports (% of total imports)	6	7
Characteristics of the agricultural sector		
Crop in total agricultural production (%)	73	66
Livestock in total agricultural production (%)	27	34
Share of arable land in AA (%)	89	87

1. Or latest available year.

2. Ratio of the sum of goods exports and imports to GDP.

Source: Authors' calculations based on UN (2017), *UN Comtrade Database*; WB (2018), *World Development Indicators*; Ministry of Labour and Employment (2016).

Figure 1.1. Macroeconomic performance and agro-food trade, 2000-16

Note: Panel A: Agro-food trade includes fish and fish products.

Source: Panel A: WB (2018), *World Development Indicators*, IMF (2018), *World Economic Outlook Database*; Panel B: UN (2017), *UN Comtrade Database*.

Agriculture continues to play a major role in the Indian economy

The diversity of natural regions and climatic conditions in India allow for the cultivation of a wide range of crops and various livestock activities. While the contribution of the agricultural sector to GDP has continued to decline over the last two decades – from 29% in 1990 to 17% in 2016 – it remains a major source of employment, accounting for about 47% of the total national workforce² [Ministry of Labour and Employment, 2016; Ministry of Agriculture and Farmers' Welfare (MAFW), 2017a; OGD Platform India, 2018; WB WDI, 2018]. The green revolution in cereal production (late 1960s - early 1980s) was succeeded by the white revolution in milk production (starting in the 1970s), the gene revolution in cotton production (early 2000s) and the more recent diversification of production towards pulses, fruit and vegetables as well as meat and meat products. This has been largely in response to evolving demand patterns driven by rising incomes and urbanisation, but government encouragement of diversification has also contributed. The share of the livestock sector in total value of agricultural production has increased from 27% in 2000 to 34% in 2016. India is also the world's largest producer of pulses, accounting for about a quarter of global output. Moreover, with the advantage of diverse agro-climatic zones, India is the world's second largest producer of fruit and vegetables after China. Since the early 1990s, India's agricultural exports have also steadily grown and diversified. As a result India has transformed from a food deficit country to a major exporter of agriculture and allied products such as rice, meat and meat products, cotton, oilcakes, vegetable extracts, fish and fish products, and several others (including wheat in some years) (Gulati, 2009, 2016; MOSPI, 2017a; OECD, 2017d, 2018; FAOSTAT, 2018).

The strong growth in production has been sustained by an improved access to inputs such as fertilisers and seeds, increased irrigation coverage (including micro irrigation), as well as greater reach of institutional credit through branch expansion of public sector commercial banks in rural areas, the introduction of the *Kisan Credit Card* scheme – enabling a more timely access to credit – and the designation of agriculture for priority lending. In response to the fragmented domestic market, and to tax and other administrative inter-state barriers, agro-food marketing channels have also diversified, with successful examples of milk co-operatives or poultry contract farming.

The rural-urban supply chain has undergone significant changes over the last decade. First, the volume going through the supply chain has tripled in the past three decades: urban food expenditures are now three times higher in real terms than thirty years ago. Second, dietary patterns have diversified over the same period. The share of cereals in calorie intake decreased from 61% in 2000 to 55.7% in 2013, with livestock products increasing from 12.8% to 17.1% and fruit and vegetables from 24.5% to 28.7% over the same period (FAOSTAT, 2018). The beginning of structural change is underway due to the involvement of the private sector, going beyond the mainly traditional or unorganised private players (including *mandi* traders, private mills, village brokers, traditional retailers) to organised private entities, such as agribusiness and large food processing companies or supermarkets. Evolving demographics, increasing urbanisation, lifestyle changes, increasing preferences for branded items, as well as a modernising retail sector are increasing demand for processed food.

Key challenges

Productivity growth lags behind other countries in the region

Despite these successes, challenges remain. The large share of employment in agriculture compared to its GDP contribution reflects the slow pace of structural transformation and the relatively low labour productivity. This is one of the reasons for the low incomes of households dependent on farming, with farm incomes at around one-third of those of non-agricultural households³ (NITI Aayog, 2017). There is wide variation in farm income growth between regions as well as between individual states (Government of India, 2017a). The government recently announced an objective to double farmers' income by 2022 (NITI Aayog, 2017).

The structural transformation in India has been atypical and less marked than in other Asian economies such as China or Viet Nam, with the fast growth of the services sector not preceded by strong growth of manufacturing and no notable transformation in the occupational structure of the economy accompanying the relative growth of the different sub-sectors. Agriculture has been slow to shed labour to other sectors in the economy partly due to the low level of education and skills of many of the workers in the sector, making it very difficult for them to find employment outside agriculture. Also contributing is the complexity and rigidity of labour laws which make the private, formal sector reluctant to create jobs.

As a consequence, farm labour productivity growth in India has been lagging far behind that of other Asian economies such as China, Viet Nam, Indonesia, and Thailand; and while land productivity has been increasing over the last two decades, a mapping of yield trends in 2011-14 highlights that this is stagnating for several key commodities. In addition to yield stagnation, gaps remain in yield potential. Average yields of most key crops in India are still low compared to other major producers and, in some cases, even world averages. For instance, current wheat and rice yields are approximately 3 times lower than the highest world yields, while yields for the main fruit and vegetables – including mango, banana, onion or potato – are between 2 to 7 times lower than the highest yields achieved worldwide. Therefore, vast untapped potential exists for yield growth across most crops and producing states; considering that the cultivated area is close to reaching its limit in India, yield improvements are key for any future output increase (Fuglie and Rada, 2015; FAOSTAT, 2018).

Fragmented land use patterns persist

What marks India out from other countries at a similar level of development is the continuing fragmentation of operational holdings, whose average size is now 1.15 ha and still falling. The sector is dominated by a large number of marginal and small scale operators: 85% of the operational holdings in India are of less than 2 ha and represent 45% of the total cropped area. In turn, only 5% of farmers operate on holdings larger than 4 ha, but they occupy nearly 32% of all arable land (Agricultural Census India, 2016).

Land tenure governance in India is very complex, both in terms of legislation and organisational framework. Rural land markets do not function efficiently as a result of several factors, including poor land records, tenancy restrictions and land ceiling laws leading to concealment of ownership status and impediments to transactions, limited mobility of potential buyers, lack of brokerage services and limited flow of information about buying and selling opportunities. India's land recordkeeping system includes a national level deeds registration system for any form of land transfer, as well as

state-level laws establishing cadastral-based records of land rights for revenue purposes. The records maintained by the deeds and cadastral systems can be, in many cases, inconsistent as periodic revisions are not co-ordinated. More significantly, the land records maintained do not constitute land titles, but only ‘evidence of title’, hampering the functioning of land markets. India imposes limits on the permitted size of farms (land ceilings) which vary widely across states – for instance, in the case of irrigated land with two crops, current ceilings vary by state from 12 acres (4.9 ha) in West Bengal or in Tamil Nadu to 18 acres (7.3 ha) in Haryana or Rajasthan. Restrictive land leasing laws have forced tenancy to be informal, insecure and inefficient (MAFW, 2017a).

Supply chains are long and fragmented

Physical infrastructure is a major bottleneck

Gaps in physical infrastructure and logistics hamper the establishment of efficient agro-food supply chains and drive up transaction costs, particularly for small and marginal farmers. While India’s quality of roads, railroads, ports, air transport, and electricity supply is better than its neighbours in South Asia, it lags considerably behind the average of East Asian economies. Aside from road transport and freight services quality, inter-state checkpoints and other checks during transit add to delays and uncertainties in the supply chain. Market infrastructure also suffers from unintended impacts of regulations in domestic markets for agricultural products: many government-regulated wholesale markets (*mandis*) do not have the facilities needed for handling, grading and storing perishable agricultural products and the regulatory environment has deterred private sector involvement.

Limited connectivity and inadequate storage infrastructure lead to post-harvest losses and impact farmers’ incomes as well as their incentives to produce. The highest post-harvest losses are registered for fruit and vegetables (ranging in 2015 between 4% and 16% of total output, depending on the state), followed by sugarcane, pulses, livestock, oilseeds, and cereals. Losses occur at all levels of the supply chain: at the farm gate, during transportation, wholesale, and retail. Moreover, the shares of high-value sectors in food processing are low: for example, fruit and vegetables and meat products account for less than 5% and 8% of total value of output respectively, compared to cereal-based products (21%) and oilseeds (18%). In the case of milk production, only 22% of cities and towns are served by organised milk distribution networks and only 15% of milk marketed is packed. Overall, India’s food processing mainly involves primary processing which accounts for 80% of the value (ICAR, 2012; World Bank, 2014; Gulati and Saini, 2017; Government of India, 2017b).

Linkages to input markets are weak

Although the availability, access and quality of farm inputs and services (including fertilisers, seeds, and credit) have improved over the past decade, their distribution across the different size-categories of farmers remains an issue. Informal channels are still widely present in the seeds and fertilisers markets, for instance. While the involvement of the private sector is expanding rapidly in seeds, about 60% of food crops in India are still sown from seed stocks selected and saved by farmers; about 39% of operational holdings use certified seeds and 9.8% hybrid seeds (MAFW, 2016). The cost of high-yielding varieties in the formal channels is often too high for marginal and small farmers to afford, thus dis-incentivising them from purchasing these varieties. With respect to fertilisers, informal channels are still mainly used in the case of urea. With only three agencies

allowed to import urea into India and significant delays in procurement processes, addressing shortages through informal channels can also lead to production cost increases.

Regional disparities remain with respect to the reach of institutional credit. Moreover, provision of credit to small and marginal farmers is still inadequate compared to needs and there is a paucity of medium and long-term lending: in 2016-17, 65% of credit was short term, while only 35% covered fixed capital formation and longer-term investments. Access to agricultural credit is also linked to the holding of formal land titles, which makes many small and marginal farmers unable to access institutionalised credit and turn to informal sources of credit such as moneylenders that accounted for 36% of the total outstanding loans of cultivator households in 2012-13 (Hoda and Terway, 2015).

Linkages to domestic downstream sectors are also weak

Both the food processing and retail sectors have been growing rapidly over the past decade, supported by the reforms in the enabling environment for business and increased private investment and growing demand due to rising per capita incomes. Notwithstanding, both sectors still have a dualistic structure: food processing, with a relatively small (in number of units) but capital-intensive organised segment coexisting with a pervasive, mostly rural, and more labour-intensive unorganised segment; food retail, dominated by unorganised and semi-organised retailers like *kirana* stores (mom-and-pop stores), grocers and provision stores that account for 98% of food sales, while larger chains and stores are mostly reaching big cities and towns. Major constraints in the development and growth of both sectors include the absence of adequate connectivity infrastructure, inadequacy of information and marketing linkages, lack or quality of electricity supply, and the absence of cold chain systems. This problem is further exacerbated by the existence of large numbers of small and marginal producers.

Opportunities to participate in regional and global value chains are limited

Indian agriculture has increasingly become integrated with world markets: agro-food trade as a share of agricultural GDP was just 5% in 1990, when economic reforms started, but reached 16% in 2016. However, it is still low compared to the share of India's total merchandise exports and imports as a per cent of India's GDP, which increased from 14.7% to 42% over the same period (UN Comtrade, 2017). Moreover, India's participation in agricultural global value chains (GVCs) mirrors the constraints and challenges encountered at the level of domestic agro-food chains and is weaker than its engagement in manufacturing or services GVCs. In terms of sourcing inputs from value chains (buying from GVCs), India's strongest linkages are in wheat, beverages and tobacco products, bovine meat, and dairy products, but overall the sector has low global backward integration (selling inputs to GVCs), particularly for processed food products (OECD estimates based on Greenville et al., 2017).

Pressures on natural resources risk reducing long-term production growth

Environmental pressures are also starting to loom large. Land degradation is increasingly prevalent throughout the country: 37% of the total land area (about 120.4 million ha) appears to be affected by various types of degradation (Indian Council of Agricultural Research, 2010). Across many regions, inappropriate application of fertilisers – in terms of timing, quantity and place and the balance of N, P and K use – does not reflect actual

soil and crop nutrient needs. Chemical fertilisers contribute to greenhouse gas emissions as well as to water pollution and soil contamination when used inappropriately.

India also faces a severe water crisis due to a widening gap between water supply and demand, as well as poor water resources management, and changing precipitation patterns induced by climate change. Total water demand is expected to increase by 32% by 2050 due to population growth, urbanisation and industrialisation. A recent OECD study identifies India, along with China and the United States, as a future water risk hotspot for agriculture production (OECD, 2017b). More specifically, groundwater irrigation in the semi-arid region of Northwest India – known as India’s breadbasket region, with large wheat and rice production – is creating worrying consequences for the water table as well as for the region’s water quality, and these problems are expected to worsen. For instance, in the state of Punjab, water demand – largely from the agriculture sector – is almost twice as high as the total water availability, putting water reserves under pressure and causing groundwater depletion at a rapid pace.

Finally, India is likely to suffer significant impacts from climate change. By mid-century, impact of climate change would be felt as an increase in the average surface temperature, changes in rainfall during both monsoon and non-monsoon months, as well as an increase in the frequency and intensity of droughts, floods and other extreme weather conditions. This is likely to result in higher output volatility and yield growth for key crops being much lower than would have been expected in the absence of climate change. Further, by mid-century in some regions, if no mitigation and adaptation actions are taken, yields are actually projected to be much lower relative to a scenario with no water or climatic shocks. Cereals such as rice, wheat, and maize, as well as cotton, sugarcane and vegetables will be particularly affected. Production of livestock products, including milk, will also be affected.

Food and nutrition insecurity is persistent for a significant part of the population

Despite rapid population growth, particularly among the poor, India has achieved a significant fall in the proportion of the population which is undernourished, from around 24% in 1990-92 to 15% in 2014-16. But the incidence of poverty in India is persistently high, suggesting that an additional, significant proportion of the population is at risk of falling back into food insecurity under certain circumstances. In addition, while India has achieved much in terms of access to and availability of food, performance in terms of nutritional quality has been less strong, as evidenced by a still relatively high incidence of stunting and wasting.

Agricultural policy trends and evaluation

The institutional settings governing agricultural and food policy are complex

In India, states have constitutional responsibility for many aspects of agriculture, but the central government plays an important role by developing national approaches to policy and providing the necessary funds for implementation at the state level. The central government is solely responsible for some key policy areas, notably, for international trade policies. Recently, the fiscal autonomy of the states is being strengthened through implementation of the recommendations of the 14th Finance Commission (FFC). While this model has strengths, allowing policy to reflect needs and conditions at the more disaggregated state level, there are also drawbacks in that important initiatives designed at the central level may be only partially, or not at all, implemented at the state level. In

particular, joined-up approaches to market institutions and regulations are important if a “single market” for agriculture and food products is to develop across India. In practice, co-ordination is facilitated by the role of the centre in funding major agricultural programmes. From 2015, the National Institution for Transforming India (NITI Aayog) fosters greater involvement of the state governments in the economic policy process, and has constituted a Task Force on Agricultural Development which has the responsibility to co-ordinate with the State and UT Task Forces and the central ministries. Nevertheless, no sufficiently strong mechanism exists to bring state and central level policy-makers together to discuss problems, design solutions, and monitor performance. Steps need to be taken to fill this gap.

At the central level, the institutions involved in developing and implementing agricultural and food policy are numerous, and consequently there is a risk of fragmentation, overlapping, and of unclear attribution of responsibilities. While the Ministry of Agriculture and Farmers’ Welfare has responsibility at the central level for agricultural policy, many other ministries and agencies have important roles. Among them the most important are the Ministry of Chemicals and Fertilizers, the Ministry of Water Resources, River Development and Ganga Rejuvenation, the Ministry of Consumer Affairs, Food and Public Distribution, and the Ministry of Commerce and Industry. A more or less similar structure is, in many cases, replicated at the state level (other than trade policy). While Inter Ministerial Committees are sometimes set up, consideration should be given to the establishment of a standing body for systematic coordination among the myriad agencies in all matters related to agricultural and food policies.

The policy emphasis has evolved as agriculture and food concerns have changed over time

From India’s early years, seeking to achieve food security has been an important objective of agricultural policy. The policies applied in pursuit of food security have evolved over time. An explicit objective, to a large extent driven by the experience of food shortages in the early 1960s, has been to pursue self-sufficiency in food production. Recent objectives have been focused on seeking faster, more inclusive and sustainable growth more broadly by bringing macroeconomic imbalances under control and reversing the economic slowdown while also pushing for structural reforms.

The most recent and also final five-year plan (2012-17) identified the key drivers of growth in agriculture as comprising (1) the viability of the farm enterprise and returns to investment that depend on scale, market access, prices and risk, (2) the availability and dissemination of appropriate technologies that depend on quality of research and extent of skill development, (3) expenditure on agriculture and in infrastructure along with a policy aim to improve the functioning of markets and more efficient use of natural resources, and (4) governance in terms of institutions that make it possible to better deliver services like credit and animal health and quality inputs like seeds, fertilisers, pesticides and farm machinery. Certain regional imbalances would also be addressed: a national priority in terms of both food security and sustainability would be to fully extend the green revolution to areas of low productivity in India’s eastern region.

In line with India’s Constitution which states that a primary duty of the government is to raise the level of nutrition, India’s public food distribution has shifted from household food security and freedom from hunger to nutrition security for the family and the individual.

The set of policies directly relating to agriculture and food in India has for a long time consisted of five major categories. They include:

1. managing the prices and marketing channels for many farm products
2. making variable farm inputs available at government-subsidised prices
3. providing general services for the agriculture sector as a whole (such as research and extension)
4. making certain food staples available to selected groups of the population at government-subsidised prices
5. regulating border transactions through trade policy.

More recently, environmental measures concerning agriculture have gained prominence.

Efficiency of agricultural marketing chain impaired by long-established rules and by absence of rules

In marketing regulation, the Essential Commodities Act, 1955 (ECA) provides for the control of production, supply, distribution, and pricing of essential commodities. They include foodstuffs and many kinds of seeds, and fertiliser. The ECA also provides for maintaining or increasing supplies of essential commodities and securing their equitable distribution and availability at fair prices. The motivation at the time was to restrict certain activities of some agents in the context of hoarding and black marketing. Under the ECA the central government makes orders regarding essential commodities, which are implemented and enforced by the state governments. In respect of food items, the ECA powers have generally been delegated to state governments except for sugar where the central government exercises some controls. Orders issued by the centre or the states regulate the production, storage, transport, distribution, disposal, acquisition, use or consumption of a commodity. Such orders can increase the cultivation of food grains, control prices, prohibit the withholding of a commodity from sale, or require a stockholder to sell a commodity to the government. Although the ECA is becoming a less pervasive factor in India's markets for agricultural commodities, the longstanding presence of the rules of the ECA is part of the foundation for today's structure of agricultural production and marketing.

While the ECA regulates transactions in the whole value chain from producer to consumer, the Agricultural Produce Marketing (Regulation) Acts in many individual states regulate only the point of first sale from the producer. The acts are often called APMC Acts since they regulate agricultural markets through Agricultural Produce Market Committees (APMCs). A state's APMC Act empowers the state to establish regulated wholesale markets, construct and manage agricultural markets and regulate all aspects of marketing, including the levy of user fees. The acts prevent private players from setting up markets and investing in market infrastructure. Major constraints on the agricultural marketing system include a highly fragmented market structure, insufficient number of markets, inadequate physical marketing infrastructure, high incidence of marketing fees and charges, high post-harvest waste, restrictions in licensing, low remuneration to farmers and high intermediation costs, market information asymmetry, and inadequate credit facilities. A series of moves to reform the marketing structures have been only partially effective, prompting the central government in 2017 to approve the Model Agricultural Produce and Livestock Marketing Act 2017 that encourages the states to end the monopoly of APMCs by allowing more players to set up markets and create greater competition. This would allow the establishment of private markets, direct marketing by farmers, the levying of the market fee only at the first wholesale purchase

from the farmer, and the exclusion of fruits and vegetables from the APMC Act. Many states have in fact removed perishables from the purview of the APMC Acts, and efforts are underway to strengthen the operation of rural markets and to link them to the electronic National Agricultural Market (E-NAM), a national electronic portal which aims to link APMCs and other market yards across the country. The E-NAM is intended to provide information on product arrivals and prices; the buy and sell offers made by traders; and allow responding to trade offers. These developments are creating the possibility for farmers to engage in direct sales to consumers or bulk purchasers.

Producers' prices often below international prices and even below support prices

Within the marketing structure defined by the ECA and the APMC Acts, the central government's price policy for major agricultural crops seeks to ensure remunerative prices to producers with a view to encouraging higher investment and production and to safeguard the interest of consumers by making supplies available at affordable prices. The Food Corporation of India (FCI) is the main agency for executing the food grain policies of the central government. The FCI (a) procures food grains from farmers at remunerative prices, (b) distributes food grains to consumers through public distribution, and (c) maintains buffer stock of food grains for food security and price stability.

The central government sets a Minimum Support Price (MSP) for 24 crops each year, as well as a bonus above the MSP for some crops. The FCI and state-level agencies operating on behalf of the FCI buy wheat, rice and coarse grains through open-ended procurement at MSP. A number of other agencies buy pulses, oilseeds and cotton at MSP, and some perishable agricultural and horticultural commodities without MSP are also procured. However, price support procurement effectively operates mainly for wheat, rice and cotton and only in a few states. Most farmers sell to other buyers at prices other than the MSP, especially in eastern India, where procurement is not effective and no alternative buyers are present.

Producer prices have for many years and for many crops remained below comparable reference prices in international markets. This is explained partly by policy-induced (i.e. domestic market regulations and export restrictions) and other inefficiencies (i.e. roads, electricity, cold storage, transport) in the marketing chain and partly by MSP having been set below the international reference prices. This has resulted in significant negative price gaps. However, in most years between 2000 and 2016, the producer price has risen above the MSP for commodities such as non-basmati rice, wheat, maize, soybeans, rapeseed, groundnuts, refined sugar, chickpeas, and cotton. Moreover, for maize and wheat, the MSP itself has been raised above the international reference price in 2015-16: the gap between the producer price and the reference price has thus turned positive for these two commodities as well as for other commodities for which producer prices have been above reference prices (for example, non-basmati rice since 2014 or chickpeas since 2015). Lately, the producer prices of milk have been very close to their international reference prices, while those for refined sugar have even exceeded their respective reference prices in some years.

The procurement of wheat and rice is of the order of 30% of production. Wheat, rice and coarse grains procured by the FCI and state agencies are issued to the relevant agencies for distribution under the Targeted Public Distribution System or other welfare schemes or disposed of through sales, including sales for exports.

Large subsidies for fertilisers, electricity, irrigation, credit and other variable inputs

On the input side major policies enable agricultural producers to obtain farm inputs at low prices. The largest input subsidies are provided through policies governing the supply of fertilisers, electricity, and water. Other inputs are also supplied at subsidised prices, as is the case for seeds, machinery, credit, and crop insurance.

The government provides domestic urea manufacturers with a subsidy to cover the difference between their production cost and their revenue from sales at the fixed selling price. Urea subsidies are a function of several subsidy calculations, which vary over time as a result of changes in international prices of urea and natural gas. The consumption of phosphatic and potassic fertilisers is met mostly or entirely by imports. For these fertilisers the government sets subsidy rates in rupees per kilogram of nutrient (nitrogen, phosphate, potash, sulphur), which translate into subsidy rates per tonne of phosphatic and potassic fertiliser.

Electricity is a major input in agricultural production in India, primarily for powering pumps for irrigation using ground water in tube wells. The state regulatory bodies are empowered to set the electricity rates the state electricity boards charge to different categories of customers, such as agriculture, industry, domestic and commercial. While the rates charged to agricultural customers are very low relative to the rates charged to other customers – and also much lower than the average unit cost of power supplies to all consumers – the electricity supply is erratic and the quality is low.

Surface water for irrigation is supplied to agricultural producers at prices lower than the costs incurred by the government agencies at central and state level that manage the supply. While groundwater as a source for irrigation has become relatively more important than surface water, government-funded projects for surface water involve building such infrastructure as canals and dams and operating and maintaining these facilities. Only a small portion of the operation and maintenance cost is recovered from the users of water in the form of an irrigation service fee.

Many kinds of seed are essential commodities under the ECA. Seed policies concern the balancing of incentives for plant breeding between the private and public sectors and encouraging farmers to use certified seeds. Several of the central government's missions in agriculture include subsidies for farmers' use of certain seeds and improved planting material. For example, assistance is available to upgrade the quality of farmer saved seeds and the government also provides training to farmers for seed production and post-harvest seed technology. The purchase or use of farm inputs of many other kinds – such as diesel fuel, pesticides, machinery and irrigation equipment – are encouraged by some form of government expenditure.

Most agricultural credit outstanding consists of short-term credit and the share has been growing. Interest subsidies in agriculture almost exclusively relate to short-term credit over six to twelve months, i.e. operating credit during the crop season, rather than subsidisation of investment in fixed inputs. The subsidy mostly takes the form of transfers to lending institutions to enable them to deliver credit to farmers at the subsidised rate. Debt relief in agriculture has applied through partial or full debt waivers, in which the government reimburses the lending institutions their cost of implementing the debt waivers. Occasionally, initiatives apply or are proposed under which a state government would provide funds for lending institutions to waive farmers' debts.

Earlier crop insurance schemes are from 2016 complemented or replaced with a scheme where no limit applies to the government's premium subsidy. The farmer's premium amounts to 2% or 1.5% of the sum insured for most crops. Buying crop insurance remains mandatory for farmers wishing to avail of credit.

Many kinds of support for producers are delivered by state governments with major funding from the central government under the heading of missions. The National Food Security Mission seeks to increase the production of wheat, rice and pulses and promote commercial crops like cotton, jute and sugarcane through financial assistance for improved technologies regarding, e.g. seed, micronutrients, soil improvement, pest management, machinery, and irrigation, as well as farmer capacity building. The National Agricultural Development Plan encourages the formulation of state and district level plans to induce the states to increase own spending on activities such as crop development, horticulture, mechanisation, natural resource management, marketing, animal husbandry, dairy development, and extension. There are missions on oilseeds and palm oil and for the integrated development of horticulture, for sustainable agriculture, and for livestock, among others. To promote a more balanced use of fertilisers and micro-nutrients, there are grants for setting up soil testing laboratories, demonstrations are organised and organic farming is encouraged. In addition, many states operate their own agricultural policies concerning, for example, improvements in irrigation, electricity supply, roads, rice varieties, crop and livestock diversification, drought proofing, marketing and procurement, land leasing, and downstream cold storage and food processing facilities.

General services to the sector focus on irrigation infrastructure, research and extension and on food safety assurance

In the area of general services, expenditures are dominated by development and maintenance of infrastructure, particularly capital expenditure on irrigation. Additionally, India has a long and venerable history of organised, state funded research and development in agriculture. Public funding for research has been increasing in real terms for decades, growing by 6% per annum during the 1990s and 2000s reflecting an exemplary level of sustained commitment for a country at India's level of development. During this period growth in central funding has outpaced state funding, reflecting the government's commitment to productivity growth and resilience in food production. The Indian Council of Agricultural Research (ICAR) is the main umbrella organisation for agricultural research in India. It has more than one hundred research institutions working under its administrative and funding control. In addition India has a long established system of state agricultural universities which play an important role in the research eco-system. India, through an open access policy to public research products, has paved the way for public-private partnerships and technology transfer (ICAR – NIAP, 2017).

The Food Safety and Standards Authority of India (FSSAI) administers the Food Safety and Standards Regulations. They apply equally to domestic and imported foods and require all food processors, manufacturers, exporters, and importers to have their products certified. The FSSAI establishes standards for food and regulates the manufacture, storage, distribution, sale and import of food, with a view to ensuring availability of safe and wholesome food for human consumption, and contributing to the development of international technical standards for food and sanitary and phytosanitary standards. The Ministry of Food Processing Industries provides assistance for the setting up and upgrading of food testing laboratories. The central government makes rules for grade designations to indicate the quality of the product and specifies grade designation marks.

Agricultural income enjoys tax concessions and indirect taxation of farm products is nil or low

The central government's income tax act specifically excludes "agricultural income" from central government taxation. While most farmers' incomes would not, in any event be sufficiently large to make them liable for income tax, this concession is significant for larger, commercial farmers. In keeping with India's constitutional distinction between agriculture and animal husbandry, agricultural income does not include income from selling livestock products, which is therefore subject to taxation. State governments, but not the centre, collect tax through a land based levy called "land revenue".

The supply of primary agricultural commodities, including food grains, is taxed at the nil rate and the supply of most other food items is taxed at low rates. By subsuming many kinds of taxes under the GST, introduced in July 2017, on the marketing of agricultural produce, the GST may ease the inter-state movement of agricultural commodities.

Large apparatus for distribution of cheap food to many, leading to major budget expenditure

Public distribution of food grains operates under the joint responsibility of the central and state governments. The central government, through the FCI and state agencies, is responsible for the procurement and storage of food grains. The central government allocates food grains to the state governments and the FCI transports food grains from surplus states to deficit states. The Targeted Public Distribution System (TPDS) operates under the National Food Security Act (NFSA) of 2013 in all states and union territories. A set of Other Welfare Schemes also operate under the NFSA. The state governments are responsible for distributing the food grain entitlements, i.e. allocating supplies within the state, identifying eligible families, issuing ration cards, and distributing food grains mainly through Fair Price Shops. State governments use their own criteria to identify families or households eligible for TPDS and NFSA entitlements, using estimates by the central government on the numbers of recipients. The centre determines the difference between the economic cost (sum of MSP, procurement incidentals, and distribution cost) and the central issue price (the price at which TPDS beneficiaries can buy food grains), which is passed on to the FCI or the state government as a food subsidy. Associated with the increase in the number of beneficiaries under the NFSA, as a greater number of states implemented the NFSA, the food subsidy increased rapidly in 2014-15 and 2015-16. Since the central issue prices are now fixed in the law and legislative changes to adjust them may be time-consuming while the procurement prices are increasing from year to year, the burden on the central budget is likely to continue to increase.

The ministry in the central government with the largest expenditure on agriculture and food is the Ministry of Agriculture and Farmers' Welfare. The Ministry of Chemicals and Fertilizers and the Ministry of Consumer Affairs, Food and Public Distribution also account for large shares of the central government's expenditures. About two-thirds of all expenditure on agriculture and food took the form of the four major items of fertiliser subsidies, agricultural power subsidies, expenditure on irrigation and flood control, and food subsidies. The steep increase in anticipated expenditure in 2016-17 by the department responsible for transferring funds to state governments is explained by expenditures on crop insurance and interest subsidies on short term credit.

Detailed and changing trade rules make for complex and uncertain export and import transactions

India's Foreign Trade Policy is announced every five years and reviewed and adjusted annually. The current policy applies until 2020. Largely driven by domestic supply considerations and also intended to attain short-term objectives, such as containing fluctuations in commodity prices, the policy requires constant adjustment through decisions by the relevant agencies, which reduces the predictability of the policy regime.

Tariffs apply to imports of most agriculture and food items (Table 1.2). Tariff rate quotas are scheduled on a few products. Import prohibitions or import restrictions apply to several products. India's Basic Customs Duty (BCD), known as its statutory rate, is approved at the time of approving the annual budget. It is in many cases lower than the WTO scheduled bound rate. For many products, the government applies tariff rates that are still lower than the statutory rates. The simple average applied customs duty of 32.7% in agriculture leaves a relatively large gap below the corresponding WTO bound rate of 113.5%. This allows India to raise its tariffs substantially while complying with its WTO commitments. India has scheduled tariff rate quotas on twelve lines at the HS 8-digit level. Imports of some products are subject to a licensing requirement, in some cases conditional also on, e.g. a sanitary or phytosanitary permit also being obtained. The FCI remains an importing state trading enterprise for wheat and rice. Imports of animal products into India require sanitary import permits issued by the relevant government department and which must be obtained prior to shipping from the country of origin.

Table 1.2. India's average and maximum applied Most Favoured Nation (MFN) tariffs, 2016

	Average (%)	Maximum (%)
Animal products	31.1	100
Dairy products	33.5	60
Fruit, vegetables, plants	29.4	100
Coffee, tea	56.3	100
Cereals and preparations	31.3	150
Oilseeds, fats and oils	35.1	100
Sugars and confectionery	35.9	60
Beverages and tobacco	68.6	150
Cotton	6.0	30
Other agricultural products	22.3	70

Source: WTO, ITC and UNCTAD (2017).

Some agricultural products are, or have in the past, been subject to export prohibitions, export quotas, and minimum export prices. State trading is required for some products, and export subsidies are provided. A WTO decision in 2015 puts an end to the subsidisation of agricultural exports, which for India would occur at the end of 2023. The government provides financial assistance to exporters for market development, infrastructure development, quality development and transport assistance.

India has for several decades managed its agricultural exports through a combination of export prohibitions, export licensing requirements, export quotas, export duties, minimum export prices, and state trading requirements. Export prohibitions and export quotas are imposed on an annual basis for a specific period, during which they may be subject to change. Goods subject to export restrictions and quotas must be accompanied by licences

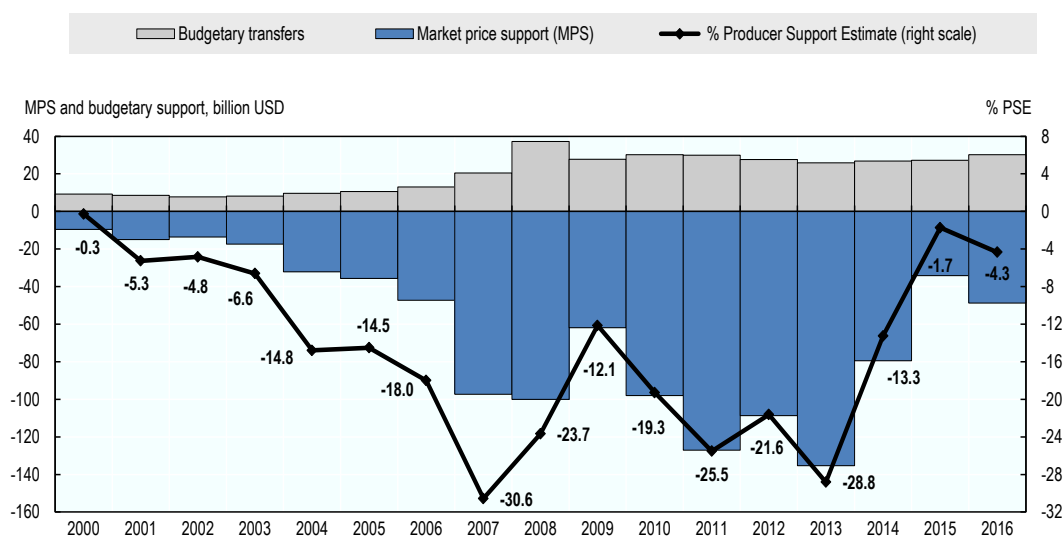
from the government's foreign trade directorate and sometimes by other permits. In 2014, export prohibitions, with some exemptions, applied to pulses (not chickpeas) and to all edible oil, but have now been removed (except for mustard oil). Exporters of boneless meat of buffalo (the only bovine meat exports allowed) require a certificate from the veterinary authority of the state where the meat originates to show that the meat is from buffaloes not used for breeding and milch purposes. The recent tightening of the rules on marketing buffaloes for slaughter is likely to negatively affect the economics both of producing buffalo meat for exports and of producing milk. India has identified several exporting state trading enterprises in agriculture in its reporting to the WTO. Exports of onions have been carried out, except when prohibited, by state trading enterprises operating at the state government level.

Input subsidies and negative price support combine to distort production in many ways

The OECD indicators of support to agriculture along with the underlying database give a comprehensive picture of the support delivered through a wide variety of policy instruments. The definitions of the key indicators are given in Box 1.2. Disaggregating support into three categories has proven useful both for the intuitive understanding of the full support picture and for further analysis:

- Market price support represents support to agricultural producers in the form of a policy-driven price gap between the producer price of an output commodity and a reference price (market price support can be positive or negative).
- Budgetary transfers include government payments to producers as well as revenues foregone.
- General services support is provided through policies that create enabling conditions for primary agriculture such as research, infrastructure and education.

India contrasts with most other countries studied by the OECD because of the prevalence of negative market price support and its size (Figure 1.2). Negative market price support indicates that the prices received by farmers, as measured for the purposes of this report, are lower than the prices prevailing on international markets for the comparable commodity. Almost all of the commodities studied individually experienced at least one year of negative market price support in the 2000 to 2016 period, and several commodities registered negative market price support in all years. The absolute amount of the negative market price support was considerably smaller in the earlier and later years than in the middle of the period. The absolute size of the negative market price support shrank particularly fast between 2013 and 2015, going from INR -8 190 billion to INR -2 239 billion in two years (from USD -135 billion to USD -34 billion). The reduction in the extent to which domestic prices fell short of the border reference prices in recent years coincides with increases in support prices and possible improvements in the marketing structure, infrastructure development, quality development and transport assistance.

Figure 1.2. Level and composition of Producer Support Estimate in India, 2000-16

Source: OECD (2017c), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.

Box 1.2. OECD indicators of support to agriculture

Indicators of Support for Producers

Producer Support Estimate (PSE): The annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on farm production or income.

Percentage PSE (%PSE): PSE transfers as a share of gross farm receipts (including support).

Consumer Support Estimate (CSE): The annual monetary value of gross transfers from (to) consumers of agricultural commodities, measured at the farm gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on consumption of farm products. If negative, the CSE measures the burden (implicit tax) on consumers through market price support (higher prices), that more than offsets consumer subsidies that lower prices to consumers.

Percentage CSE (%CSE): CSE transfers as a share of consumption expenditure on agricultural commodities (measured at farm gate), net of taxpayer transfers to consumers.

General Services Support Estimate (GSSE): The annual monetary value of gross transfers to general services provided to agricultural producers collectively (such as research, development, training, inspection, marketing and promotion), arising from policy measures that support agriculture regardless of their nature, objectives and impacts on farm production, income, or consumption. The GSSE does not include any transfers to individual producers.

Percentage GSSE (%GSSE): GSSE transfers as a share of Total Support Estimate (TSE).

Indicators of Total Support to Agriculture

Total Support Estimate (TSE): The annual monetary value of all gross transfers from taxpayers and consumers arising from policy measures that support agriculture, net of associated budgetary receipts, regardless of their objectives and impacts on farm production and income, or consumption of farm products.

Budgetary support in India is mainly provided as subsidies for variable input use, such as fertiliser, electricity, and irrigation water. Having peaked temporarily in 2008, these subsidies have been rising again in the most recent years and reached INR 1 976 billion (USD 29 billion) in 2016.

The percentage Producer Support Estimate (%PSE) combines market price support and budgetary spending benefitting farmers and expresses the total as a percentage of gross farm receipts. India's %PSE has been negative over the entire period covered by the study. Due to the very rapid decline in the absolute value of the negative market price support in recent years, in combination with the increase in input subsidies, there has been a significant increase in %PSE, although it remains negative. It had been as low as -29% as recently as in 2013 before getting close to nil in 2015 and dropping back only slightly to -4.3% in 2016 (average of -6.2% in 2014-16). The similarity in the orders of magnitude of the negative market price support and the positive input subsidies means that they arithmetically more or less offset each other when combined to form the PSE. However, both support components are of the potentially most distorting type, and the distortions they create in the Indian economy do not cancel each other.

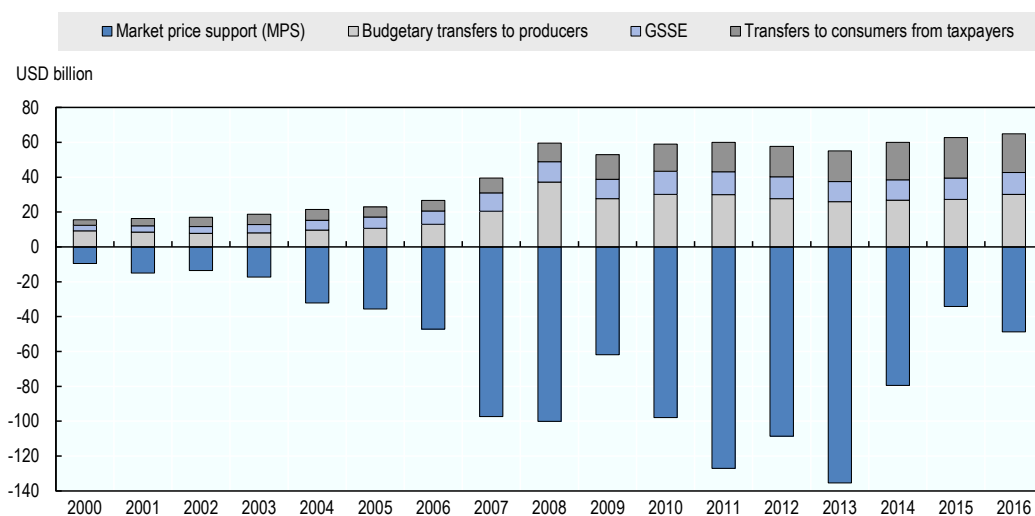
Support to the agriculture sector in the form of general services support (GSSE) amounts to only about one-third as much as support to individual producers (PSE). The dominant expenditure category in GSSE is development and maintenance of infrastructure, almost all of which relates to hydrological infrastructure, specifically capital expenditure on irrigation. Expenditure on the agricultural knowledge and innovation system (knowledge generation, education, and extension) has consistently amounted to about 10% of the GSSE expenditure. Most of this has in recent years been for knowledge generation and extension, leaving a very small share for education.

Food consumers in India benefit through two major kinds of support: low prices and government subsidies. Because producer prices for many commodities are below the border reference prices, consumers paying market prices pay less for food than they otherwise would do. This is in contrast to the situation in most other countries. An additional large component of consumer support in India is the food subsidy, which allows large segments of the population to purchase food grains at prices that are much lower than their already low domestic market prices. Altogether, these policies have resulted in a percentage Consumer Support Estimate (%CSE) of 24.7% on average across all commodities in 2014-16.

The sum of transfers to agricultural producers individually (PSE) and collectively (GSSE) and direct budgetary transfers to consumers indicate the cost that support to the agricultural sector places on the overall economy (Figure 1.3). However, the presence of large negative producer price support makes it difficult to interpret the indicator as the arithmetic offsets do not translate as offsets in the distortions associated with the

underlying policies. The positive transfers altogether (i.e. sum of budgetary transfers to producers, GSSE and transfers to consumers from taxpayers, and not counting the negative market price support) amounted to as much as 1.9% of GDP in 2014-16. The positive transfers to producers, to the agriculture sector and to consumers altogether corresponded to about 21% of gross value added in agriculture (crops and livestock) on average in 2014-16. The budgetary transfers to producers and to the agriculture sector (i.e. input subsidies and GSSE) were by themselves equal to 14% of gross value added in agriculture.

Figure 1.3. Level and composition of Total Support Estimate in India, 2000-16



Source: OECD (2017c), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.

1.2. Policy recommendations

Fostering sustainable productivity growth

What role for smallholder agriculture?

In the long term, significant structural adjustment needs to occur in India involving the transition of significant amounts of labour to other activities, a reversal of farm fragmentation, and a process of consolidation towards farm operations sufficiently large to benefit from economies of scale. Without this, it will be impossible to boost productivity and generate incomes sufficient to provide a decent standard of living for those in agriculture relative to rising incomes of those employed in other sectors of the economy which are being fuelled by sustained growth. Improving relative incomes for agricultural producers is heavily dependent on the nature and dispersion of growth in the economy more widely, and on the nature of job opportunities which this generates. While education may permit later generations to aspire to more skilled jobs, many of the current generation of agricultural workers have relatively low levels of education and will only be able to transition out of agriculture if low skilled manufacturing, construction or services jobs become available. Thus, the nature of economic growth more generally and how and where it generates jobs will be key determinants of the performance of agriculture.

Resolving land issues to support productivity growth

Clarity about titles and security of tenure are essential to generate the sustainable productivity growth that India needs and to bring about decent farm incomes. Timely and accurate information and records about land ownership are needed. The current dual land recordkeeping system, with sometimes conflicting records, is a barrier to producer development and farm consolidation. In particular, lack of clarity about land title limits access to credit, diverting many farmers to the informal credit sector where very high interest rates are charged. Fragmentation of farms due to distress sales often results, in part explaining the rise in the share of landless labourers in the overall agricultural labour force.

Succession laws in India favour the fragmentation of holdings. One way to overcome this is to separate ownership and operation of a farm holding through legally secure tenancy and leasing regulations. Current arrangements in India do not permit this. Both owners and operators of land need legal security, the former that he will not lose his property if he allows someone else to cultivate it, the latter that he has the security of tenure needed to justify investment in human and physical capital. Significant steps have been taken already through the development of a model Land Leasing Law by NITI Aayog. Some states have already adopted the model and implemented new laws, in some cases going beyond what is contained in the model law, but others have not yet acted. Additionally, farmers with a formal tenancy under the Acts can access institutional credit, insurance, disaster relief and other support services. This is of crucial importance. Unless and until secure land leasing is provided for, fragmentation will continue and the sector will struggle to generate the needed productivity improvements.

This, together with the problems surrounding titles and the absence of secure tenancy arrangements, is impeding the emergence of economically viable farm units, whether operated by full-time or pluriactive farm households. There should be no need to define or legislate for what that viable farm size should be.

Recommendations

- Strengthen the regulatory environment governing land issues by:
 - Gradually loosening ceilings on farm size and harmonising across the states, with a view to eventual elimination.
 - Implementing strengthened leasing and tenancy regulations to protect the interests of both land owners and tenants with a view to fostering a better investment climate.
 - Accelerate efforts to clarify land titles and to keep them up to date, as well as the ongoing effort to digitalise records.

Reforming market regulations and strengthening market functioning

The Producer Support Estimate indicators (see section 5 of Chapter 3 and Figures 1.2 and 1.3 in this Overview) highlight one of the fundamental issues in Indian agriculture: namely that for many products and over most of the period reviewed, Indian farmers are receiving prices which are lower than the prices prevailing on the comparable international markets. This occurs despite the stated intention of the government to ensure that farmers receive remunerative returns and the myriad regulatory and other interventions which are made in support of that objective. Observed outcomes can be at least partly attributed to the fact that policies were designed in an era of scarcity to prevent hoarding and exploitation of farmers. They also point to the conflict inherent in

attempting to regulate markets both to provide remunerative prices to farmers and stable and fair prices for consumers. This has led to strict control of what private actors are allowed to do in markets rather than seeking to create the conditions and basic rules that give rise to a competitive market place that has the potential to deliver these outcomes organically. This prescriptive approach has been compounded by a lack of supporting infrastructure that raises the costs of participating in markets in the first place, and has, in some instances, misdirected policy attention from fixing development gaps and overcoming inefficiencies in favour of attempts to limit the actions of market players.

The Government of India is aware of these issues and has taken several important initiatives to remedy them. A new model APMC Act was developed in 2003 and model APMC rules in 2007. Some states took steps to implement some or all of the provisions of the Model Act bringing about some harmonisation and reductions in the ‘red-tape’ associated with participating in agricultural markets. A further step was taken in April 2017, when a reformulated APMC Act was sent from the central government to the states, although the fact that the previous model act had not been applied, or only partially, in many states suggests that implementation will continue to be difficult. Among other provisions, the reformulated Model Act proposes a single licence and single point of entry levy for wholesale markets. Other broader reforms are also seeking to simplify markets and the costs imposed by government. The introduction on 1 July 2017 of the GST is also an important step in the right direction harmonising and consolidating previously existing levies, fees and taxes to some extent, and clearing the way for the development of simplified inter-state trade. The recently established E-NAM is a promising effort to create an all-India market, using digital tools and permitting transactions to occur without physical inspection of the goods.

These measures have the potential to remedy many of the deficiencies of the current system and should be implemented vigorously throughout India. The pace and sequence of reforms needs to be carefully planned. Government involvement and control of the marketing of agricultural products has been pervasive. The process of bringing more private actors into the system and allowing beneficial competition has to be carefully managed and supported by transparent and continued regulatory reform. As private market actors come to the fore, government can step back. Farmers will be key actors in this transformation and modernisation process. Many of them do not currently have the skills to operate effectively in a more market oriented environment and will need support through reinforced development of farmer organisations, and more targeted education and extension services than are currently available. Deficiencies in market transparency will also need to be remedied, including, in the longer term, through the development of more accurate price reporting and futures markets which are currently not permitted in India.

Recommendations

- The central government could work closely with the states and UTs to thoroughly reform regulations to foster the development of more efficient and competitive markets. First and foremost efforts to deploy and implement reforms already designed, such as the new model APMC Act and E-NAM, could be reinforced including inter alia the rationalisation of levies and fees and the reduction of “red tape”. States should be encouraged to avoid “cherry picking” and the new provisions should be adopted in a harmonised and consistent way across states.
- Sound competition policy arrangements need to be put in place to establish the ‘rules of the game’ and to provide recourse for both consumers and producers when faced with uncompetitive practices.

- Over time allow private actors to operate in the markets and abolish the monopoly granted to government controlled wholesale markets. Permit private storage and remove restrictions on intra and inter-state movement of agricultural products.
- Supply chain arrangements should be fostered which could help overcome deficiencies in the current market environment, including contract farming with transparent contracts and strengthened legal enforceability.
- Invest, and permit private investment in, market infrastructure for handling, grading and storage of agricultural products.
- Strengthen farmer involvement in co-operatives and in producer organisations to enable them to participate effectively in better functioning, more competitive markets, including through targeted education and extension efforts.
- Improve transparency on market conditions and prices and consider investing in a price observatory to do this; in the longer term allow the development of futures markets and invest in educating farmers and other market actors in how to use them for price discovery and reduced volatility.
- Provide a predictable and stable international trade regime, both for imports and exports, in order to foster the investment needed for the development of a modern, efficient supply chain from farm to retail distribution.

The future of the system of Minimum Support Prices

The government at Cabinet Committee level currently sets Minimum Support Prices (MSPs) for 24 agricultural commodities. The Commission on Costs and Prices recommends the level of the Minimum Support Prices each year. In doing so it is required to take into account costs of production, supply and demand conditions, international prices, inter-crop parity, the terms of trade between agricultural and non-agricultural goods, the likely impact on consumers and on the overall economy, and utilisation of scarce natural resources like water and land. No specific weights are applied.

For the level of price intended in the setting of the MSPs to materialise, import restrictions need to be in place and the government needs to act as buyer of last resort when and if prices fall below the announced levels. In practice, in India, the MSP plays a determinant role in prices only for wheat and rice, and to some degree for sugarcane and cotton. In operations closely linked to the public food distribution system, the government (Ministry of Consumer Affairs, Food and Public Distribution) procures very large quantities of food grains and in the major producing states observed producer prices correspond quite closely to announced MSPs. For most other commodities, no apparatus exists for the government to act systematically as buyer of last resort. Prices are thus determined by domestic supply and demand with domestic markets shielded from imports as a result of tariff and non-tariff restrictions. These arrangements have led to wide intra and inter-year price fluctuations with the prices received by farmers, for most products and in most years, below benchmark international prices for the same commodities.

The MSP system is nevertheless significantly influencing the production choices being made by farmers in India – in so far as it encourages production of wheat and non-basmati rice. This has created large exportable surpluses in these two crops as farmers have responded to the relative price incentive offered, as well as to the security and stability of access to a sure market for their product. This may be hampering diversification into production of higher value products and is exacerbating the pressures on natural resources such as water, in the major producing states.

MSPs of many commodities have been increased sharply in recent years, while international prices of the same commodities have been falling. Most recently, the discussion has centred around the idea of setting the MSPs at 50% above the cost of production in an effort to spur achievement of the goal to double farmers' incomes by 2022. Domestic prices have already been converging to international prices and in the case of wheat and maize now exceed them. This threatens the competitiveness of Indian exports, and places the continuation of the system at risk in a situation where export subsidies are not permitted (WTO, 10th Ministerial Conference decision made in Nairobi in 2015). As has been seen in other countries, keeping administered prices above world levels will force the accumulation of stocks, increasing market uncertainty for producers and costs for the government.

If adopted, cost-plus pricing raises several issues. It removes incentives to reduce costs and improve efficiency and allows the least efficient producers to stay in business. It also raises prices for consumers, increasing pressure on family budgets especially of the poorest households who spend a very high share of their budget on food, notwithstanding the PDS. Finally, cost-plus pricing may not be effective in bringing about the desired increase in farmers' incomes as the least efficient incur the highest production costs.

Recommendations

The overarching objective should be to allow market signals to be the main determinant of the production choices that farmers make. Ultimately this would make the system of MSPs obsolete, with some immediate steps which could be taken as follows:

- Ensure that MSPs do not exceed international benchmark prices for the commodities covered. To protect the export competitiveness of Indian agricultural production, ensure explicit consideration of this in the price setting process.
- Review the process whereby MSPs are set in relation to production costs, to avoid locking in inefficient high-cost production and raising prices for consumers.
- Improve farmers' remuneration through market reforms and more competitive practices and not by creating or expanding potentially costly and wasteful procurement systems.
- Increase the incomes of the poorest farmers through targeted direct cash transfers, rather than through raising prices above market levels.
- Synchronise market regulation and MSP reforms in a coherent plan communicated in advance, with a view to avoiding disruption as governments gradually give way to the private sector.

Encouraging efficient and sustainable use of variable inputs such as fertilisers

The combination of market regulations and development deficiencies has a price depressing effect in Indian agriculture, as government grapples with the conflicting aims of ensuring low prices to consumers and remunerative prices to farmers. In part to compensate for lower prices, the government intervenes to lower input prices in agriculture, across a broad range of inputs from fertilisers and power, to water, seeds and credit. OECD analysis suggests that these types of subsidies are generally more production and trade distorting than price supports, that they are not very effective in raising farmers' incomes due to leakages, and can contribute to environmental damage and resource pressures (Dewbre et al., 2001; OECD, 2001; Martini, 2011).

Undoubtedly, access to subsidised fertilisers has significantly increased their use and contributed to the strong growth in production achieved by India. However, several

problems have been identified suggesting that it may be timely to review the operation of the system. Firstly, there is considerable leakage with significant benefits accruing to unintended beneficiaries both within and outside India. Waste occurs at the farm level, as fertilisers are not necessarily applied correctly and they contribute to greenhouse gas emissions, and water and soil pollution. Finally, public monies currently spent on fertiliser subsidies would achieve a higher return for farmers and for the Indian economy, if diverted to longer term investments in infrastructure, education, and research, to increase resilience and sustainability.

Recommendations

Fertiliser subsidies should be scaled back and, in the long term, eliminated. First steps could be as follows:

- Put an end to the system whereby the subsidy rate varies with international prices by setting a fixed, nominal subsidy rate and gradually phase out over a period to be decided and communicated in advance.
- Devote the savings generated to educating farmers in efficient and sustainable use of fertilisers and other chemical inputs, to accelerate development of the soil card system and to research and development efforts to promote responsible and sustainable fertiliser use adapted to specific conditions and crops.
- Broaden the pilot programme to replace fertiliser subsidies with a direct benefit transfer (DBT) allowing farmers to make their own decisions about the best use of the available funds, and continue to adjust the scheme in light of experience in implementation.

Avoiding a major water crisis

Despite growing awareness of the severity of the problem, over-exploitation has continued, and diversification to other, less water thirsty crops, or the development of micro-irrigation in some regions, has not been sufficient to redress the problem. Farmers, partly responding to the incentives provided by the MSPs continue to grow predominantly rice and wheat. Irrigation is still dominated by tube wells which are highly suited to fragmented holdings, but which, by their nature, allow uncontrolled access to increasingly scarce groundwater. Highly subsidised or free power exacerbates the problem as it enables farmers to continue pumping from these wells, even when the underlying aquifer has reached worryingly low levels. The associated fiscal burden on many state governments is huge (such as in Punjab and Haryana). In some states, expenditure on the power subsidies alone exceeds the combined state expenditure on education and health. Additionally, the water rates fixed for supply of water from many major, medium and small projects funded by the government cover only a small fraction of the operating and maintenance costs, thus diminishing the capacity of the states to maintain these projects.

In view of the extreme sensitivity around water issues, any radical changes from current approaches will require strong leadership and extensive consultation with stakeholders in agreeing clear long-term directions and in mustering the needed long-term investments. The negative effects on production and productivity of failure to undertake significant water reforms will be exacerbated by climate change, which is expected to result in greater variability in rainfall, decline in river flows as well as higher temperatures.

Recommendations

In addition to correcting the perverse incentives to continue to produce water-intensive crops created by the MSP and PDS systems, specific short and long-term actions are needed, as follows:

- Generalise the introduction of restrictions on hours during which free electricity for pumping water is provided, particularly in areas where withdrawals are already in excess of recharge capacity.
- In parallel, continue the effort already underway to improve the reliability of electricity supply to ensure that electricity is actually delivered during the allotted periods, and to separate the feeders for irrigation water supply.
- Launch a massive campaign of awareness raising and education among farmers to alert them to the risks associated with a “business as usual” scenario.

In the longer term, more careful use of water while preserving the current production structure and practices will not be sufficient.

- Electricity pricing will also need to be reviewed to correct the perverse incentive currently created by the power subsidies.
- Accelerate research in crop varieties (and breeds of livestock) needing less water, more drought resistant and adapted to the climatic and agrological conditions in the areas under stress.
- Enlist all concerned actors, public and private, upstream and downstream in developing collective-action groundwater and watershed management schemes encompassing infrastructure development, new technologies and new institutions.
- Put in place overall water management schemes that cap agriculture water use according to available water resource, and, where appropriate,⁴ invest in efficient irrigation technologies such as drip irrigation and precision agriculture, including in rain-fed areas where water is plentiful and irrigation, to date, little used.
- In areas facing the most important water risks, consider stronger measures such as limiting extraction or introducing water charges which reflect the opportunity cost of the resource before investments in water use efficiency.

Strengthening access to credit

In India, short term credit predominates and there is a persistent problem of arrears due to poor repaying capacity of farmers. There is a need for a better analysis by banks on where the risks lie in the extension of agricultural credit, and to then find market oriented solutions for mitigating such risks. Banks could adopt a more specialised approach to the characteristics of different agricultural sectors and regions in order to achieve a better understanding of agricultural credit needs and risks on a disaggregated basis. Clearing issues around land titles will be essential to support collateral and contract issues; restrictive tenancy laws have also hampered credit flow. Information technology needs to be used to facilitate transformation in various processes of rural credit.

Since the mid-2000s the policy-driven stimulus to use of variable inputs has increased substantially as a result of interest rate subsidies on short-term credit. The concentration of credit and credit subsidies on short-term input use diverts capital away from the long term capital investment required to raise productivity in India’s agriculture. In addition to ongoing interest rate subsidies, policy decisions have written off many farmers’ debts in some years. Some state governments wrote off large amounts of farm debt in 2017, and write-offs have been proposed in several other states. The moral hazard implications of

debt relief can be significant as write-offs can affect both borrowers and banks behaviour. Repeated write-offs may encourage wilful default under the expectation of future waivers. This may make banks more conservative in terms of credit allocation. In addition, such measures may further encourage farmers to borrow in order to purchase and use such operating inputs as fertiliser, electricity and irrigation water, the prices of which are already heavily subsidised.

Recommendations

- Continue to improve the reach and accessibility of public sector commercial banks in rural areas and improve their capacity to assess risk and payment capacity.
- Take measures to restrict the activities of informal lenders; a stronger formal sector would be helpful in this regard.
- Encourage long-term loans by diversifying the package of financial services available to farmers in order to support investments in sustainable productivity growth on farms.
- Reduce and eventually eliminate recourse to debt forgiveness which is encouraging behaviours by borrowers and by banks that undermine the development of a viable commercial farm lending sector.

Agriculture Enabling Environment

Increasing agricultural productivity and scaling up the participation of farmers in value chains requires good governance through laws and regulations that are conducive to private-sector economic activity while addressing market failures, strong and effective institutions through which policies can be operationalised, as well as an adequate provision of public goods across all economic sectors. Collectively, these elements create an enabling environment for innovation at the farm level and for other businesses in agro-food value chains, by building economic capacities and by shaping incentives for investment and sustainable use of natural resources. The Agricultural Growth Enabling Index (AGEI) developed by OECD and IFPRI – which covers all of the above-mentioned components – highlights that political stability, financial markets and trade facilitation in its economy-wide blocks are areas of relative strength in India, when compared to other economies at similar levels of developments (Diaz-Bonilla et al., 2014). In turn, India performs below-average with respect to institutions, the stock and quality of infrastructure, as well as goods and labour markets efficiency. The AGEI also points to areas of relative weakness in agriculture – and the rural sector more broadly – including capital intensification (measured by the capital stock per person employed in agriculture), land market rights and access, and sustainability aspects such as pressure on water resources, issues dealt with in detail throughout this report.

Recommendations

- Invest in infrastructure in rural areas, both general, such as roads and health care, and specific infrastructure facilitating development of the agro-food sector. Digital connectivity could be particularly important in this respect.
- Invest in education in rural areas with a view to improving the employment prospects of those whose long-term future will not be in agriculture.
- Ensure that job-creating development is spatially dispersed so as to create income-generating opportunities for those whose land holdings are too small to alone generate a decent family income.

Harness innovation for sustainable productivity growth and climate change adaptation and mitigation

Innovation has been central to the major transformations that have characterised Indian agriculture. Innovation also holds the key to how India will respond to the new and multiple challenges now facing the food and agriculture sector. Demand for food and for a more diverse diet will grow as population grows and more and more people transition from poverty to the middle classes. Natural resources are under stress, particularly water in some parts of the country and climate change is projected to hit India hard. At the same time, strategies need to be deployed to increase productivity on the small, resource poor and largely subsistence farms which dominate the agriculture sector.

The challenges facing India are multiple and complex and amplified by the dominance of smallholder farmers and landless labourers in the work force. Without significantly increased investment in the agricultural knowledge system and in the institutional framework needed to ensure a systems approach (that is appropriate concertation and consistency among the different actors) India will find it difficult to deliver on food and nutrition security for its own people and to further develop as an agricultural exporting nation. High priority should therefore be given to a much strengthened agricultural innovation system. Returns to this investment in the long run, if it is effectively carried out, are enormous.

Prioritising and reinforcing research and development

Research intensity in India, at about 0.4% of agricultural GDP during 2012-14 and growing, remains relatively low compared to Brazil (1.8%) and high income countries (at around 3.0%), although it sits close to China (0.6%). The government, cognisant of the importance of research for the future of the sector, has committed to increasing the research intensity to 1%. Achieving this target will be crucial.

Strengthening extension services and education

The extension service is widely credited as having been a key factor in the spread of the green revolution in India, but public commitment to the system and its effectiveness have been erratic over the intervening period. Public funding was increased strongly in recent years and extension intensity, as measured by spending as a percentage of agricultural GDP, rose quite sharply from 0.14% at the beginning of the century to 0.18% during 2011-13. If the living standards of India's large smallholder population are to be improved, extension services will need to go beyond the traditional areas of technology transfer to encompass business skills, facilitate the diversification needed to overcome resource scarcities and provide farmers with the skills to operate in and deliver the products demanded by the development of agro-food value chains. Regions and states with agricultural potential but with currently very low levels of commitment to extension services should be specifically targeted. While the public sector will need to continue to play a major role, participation of many different actors should be actively encouraged, and the role of the private sector in particular should be much increased.

Investing in improved seeds

The development, production and distribution of improved seeds should be a key priority of both the central and state governments in the inputs area, with about two thirds of farmers not using certified or hybrid seeds. The rapid increase in cotton yields from the

early 2000s demonstrates the potential for private efforts to contribute significantly to the availability of improved seeds also for other crops. While issues can arise with regard to the balancing of public and private interests in this critical inputs area, sound market-oriented policies that allow both for competition and for remuneration of effort would have the potential to ensure the ongoing funding of research, development and innovation needed to increase the availability of seeds that are adapted to the local conditions and to climate change challenges in various parts of India, as well as generating much needed yield improvements.

Harnessing the potential of the digital economy

Modern technologies such as ICT have enormous potential to overcome deficiencies in personnel and infrastructure for the delivery of new knowledge and skills to farmers. For this reason investment in the infrastructure needed for a well-functioning digital economy will be an important prerequisite, both for agricultural and for rural development more generally. More specifically, the full potential of ICT, big data, and precision agriculture will need to be harnessed to the task of generating sustainable productivity growth, including resolving the water crisis, and coping with climate change.

Ensuring that intellectual property protection supports needed innovation

Appropriate protection of intellectual property rights is essential to foster the private development of new technologies, whether by domestic actors or through accessing technologies developed internationally. While India has enacted legislation to conform with international obligations such as under the WTO TRIPS (Trade Related Aspects of Intellectual Property Rights), India has been reluctant to go beyond such provisions and there have been some issues in implementation. For India to be able to access the technologies it needs to achieve sustainable productivity growth including many already developed or under development, it must be able to guarantee appropriate protections. Otherwise, India's agriculture may have to forego key technologies which the current research system is not in a position to generate by itself. More generally, in India, there is resistance in both official and farmer circles, to exclusive reliance on technologies from abroad due to a perception that dominant firms will extract excessive rents from a captive farm clientele.

Recommendations

The overarching need is to secure increased funding for the agricultural innovation system, including potentially through the diversion of funds from programmes which have been identified in this report as inefficient, wasteful and harmful for the environment.

Specifically:

- Provide the funds needed to increase the research and development intensity of the agricultural sector, while paying attention to the appropriate balance between strong central priority setting and co-ordination, and more bottom-up regional and local approaches, to the quality of research personnel, and to systematic monitoring of outcomes.
- Encourage inter-disciplinary and systems approaches to innovation, and strengthen the focus on current challenges such as sustainability, climate change and diversification needs.

- Continue and intensify reforms of the extension system, focusing on the needs of smallholders unable to access commercial services, and going beyond classic approaches to focus more on climate change, sustainability, and on business and digital skills. Pay attention to the quality of extension personnel and to systematic monitoring of outcomes.
- Invest in digital connectivity in rural areas, to enhance the potential to deliver education and extension services, as well as market information, and facilitate broad agricultural and rural development.
- Ensure that intellectual property protections are supportive of needed innovations, and accompanied by appropriate competition policy settings.
- Launch a wide awareness-raising campaign explaining the needs for, and benefits of, new technologies to the Indian public.

The role of agriculture in enhancing food and nutrition security

Achieving food security ranks as one of the key, if not the first, priorities of the Indian government. Such is the importance of food security that the most recent legislation, the National Food Security Act (NFSA), creates a legal entitlement to food covering 75% of the rural population and 50% of the urban population. Looking to the future, while the nature of the problem is shifting, food security will continue to be a key focus of government policy. The main challenge will be to adjust the public distribution system to changing needs as the economy grows and higher incomes make more households food secure, while ensuring that the most vulnerable segments of the population continue to be taken care of. This will need to be done while coping with resource pressures, which in the case of water are already severe, and adapting to climate change, the impacts of which are also projected to be severe. Finally, with huge competing demands for scarce fiscal resources, the governments, state and central, will need to ensure effectiveness and value-for-money in how food security programmes are implemented.

India has made significant progress in recent years in eliminating waste and inefficiencies in the current system and these efforts should be continued. Problems, nevertheless, persist. The costs of the programme have risen dramatically and constitute a huge burden on the country's limited fiscal resources – currently 0.86% of GDP and 6.6% of total government spending. Waste and leakage continue to be significant. The current programme is too centred on food grains and may be slowing down or preventing the diversification in diets needed for better nutrition outcomes in India. Finally, India's use of closely intertwined policies to, at the same time, provide producer incentives and reduce consumers' outlays on certain foods has attracted scrutiny by trading partners and, more important, narrowed India's options in seeking to make international trade rules more supportive of a market-oriented domestic agenda for the longer term. Simultaneous efforts on both the domestic and international fronts present the best hope for an enduring solution (Box 1.3).

Reforms to market regulations are a prerequisite to, and an intrinsic component of any reform of the food distribution system. Reducing public food distribution necessarily means reducing government purchases of food grains, which would limit government involvement on the producer side as a buyer. Over time and in tandem with those reforms, reforms to MSP as proposed and investments in market infrastructure would be required to prevent a fall in producer returns.

Box 1.3. Food security and self-sufficiency

Different countries have taken different approaches to solve issues of food security for their populations. Some have leveraged development and income generation as the key tool to allow consumers to access food supplies that have been underpinned by access to supplies on international markets. Others, among them India, have sought food security through policies that seek to enable a country to become self-sufficient in particular staple crops. However, recent work by the OECD has found that self-sufficiency policies are not the most effective policy in dealing with issues of food security. Indeed, unless self-sufficiency is back by comparative advantage, such policies may be counter-productive for food security and increase the exposure of domestic populations to food insecurity – that is temporary falls into food insecurity caused by natural (such as droughts) and economic (such as macro events or adverse world price movements) shocks.

A recent study exploring food security in Southeast Asia has found that opening domestic staples markets – in this case rice – to international and regional supplies can significantly enhance food security. The gains possible are particularly strong in those countries where the use of self-sufficiency policies have contributed to significantly higher domestic prices than those seen on international markets. As food insecurity is concentrated among lower-income households, the net impact of these policies on food security is negative. In Indonesia, for example, the gap between domestic and world prices has been widening in recent years, and in 2012-14, domestic prices rose to 70% above comparable world prices (OECD, 2015). As poorer households tend to spend a greater proportion of their income on food – in the case of Indonesia, Myanmar, the Philippines, Thailand and Viet Nam – the overall price increases have serious consequences for food security, albeit to a lesser extent in Thailand. For example, removing price support measures through rice market integration would improve access to rice and reduce undernourished populations in Indonesia and the Philippines by 10% and 54% respectively (OECD, 2017d). Overall, across the five countries examined, regional integration of rice markets was found to have the potential to reduce undernourishment by around 5%. Moreover, the higher prices resulting from these policies increase not only the levels of undernourishment overall, but also the vulnerability of households, leaving them less able to cope with the impacts of more frequently occurring domestic production disruptions. Outside the sector itself, other policies such as restrictions on inward foreign investment have had similar effects on prices.

The linkages between food trade and food security relate to both the supply side (producers) and demand side (consumers). On the supply side, participation in international markets and through agro-food global value chains (GVCs) has the potential to provide opportunities for income growth (via higher prices than would be received in the absence of trade) and may help in transformation towards a more productive and higher value production set. More broadly, the location of production in areas where resources are used relatively efficiently contributes to higher per capita incomes and faster economic growth. However, sector and overall policy settings are important in enabling producers to get the most out of these markets and thus trade openness itself is unlikely to be enough. Further, trade openness will also cause adjustment if barriers are removed, having direct impacts on individual households, highlighting the importance of transitional measures and safety nets in this process.

On the demand side, trade can directly help in providing access to safe, accessible and stable supplies of food. Trade is a critical element in balancing food deficit and surplus regions, thereby increasing the availability of food by enabling products to flow from surplus to deficit areas. In terms of access, open markets can help consumers through lower prices for food than would otherwise be paid. Open trade can also improve utilisation and nutrition by increasing the diversity of national diets (OECD, 2013). Finally, open markets generally improve the stability of availability and access, for the simple reason that the risks associated with own food production, exceed those of pooled production on international markets (OECD, 2017d).

Source: OECD (2017d, 2015, 2013).

Central and state governments alike in India are aware of the need for constant re-assessment of needs and monitoring of the effectiveness and efficiency of outcomes. Many researchers, commentators and official bodies, among them the High Level Committee on Restructuring the FCI (known as the HLC), propose a gradual and progressive move away from the current mass distribution system to a system of direct benefit transfer (DBT). Scenarios developed for the purposes of this report confirm that significant benefits would accrue, across many dimensions of policy performance, and therefore also support this course of action (Box 1.4). But, in this area, as in others where government has been the principal actor, the process of change needs to be planned carefully, implemented progressively and communicated consistently to avoid any risk of disruption to the food security of vulnerable segments of India's vast population.

Box 1.4. The medium term market and food security impacts of implementing direct cash transfers

The final chapter in this report examines what would happen over the medium term if the NFSA remains in place compared to a situation where the public grain distribution is gradually and partially replaced by cash transfers. The scenarios are developed and examined using the OECD-FAO Aglink-Cosimo model.

The cash transfers are modelled to be introduced gradually over the course of five years because not all states are equally ready to implement cash transfers. In addition, it is assumed that the cash transfers are only implemented partially and that 30% of the NFSA is maintained in the rural areas. This accounts for the fact that cash transfers are not feasible in areas where people have limited or no access to markets or banks and for the fact that certain people prefer physical grains instead of cash.

The analysis distinguishes between four groups of consumers: urban low income, urban high income, rural low income and rural high income. The low income groups correspond to the population that is eligible for public grain distribution and that could hence receive the cash transfer under the alternative scenario.

There are four key findings. First, the scenario results show that the NFSA beneficiaries are at least as well off under the cash transfer programme as under the food distribution programme in terms of per capita availability. Second, diets are projected to be more varied when consumers receive cash than when they can buy rice at subsidised prices. Third, the cash transfer programme will be less costly than the public distribution programme. Fourth, a move towards cash transfers will perform better, in terms of food security outcomes, in the face of high international prices.

Recommendations

- Gradually reduce the share of the population covered by the NFSA 2013 as economic growth and associated standards of living increase, allowing some households to be omitted as they reach higher levels of income. At the same time, the central issue prices at which entitled households purchase food grains from fair price shops could be increased, as provided for by the legislation but not implemented since 2002.
- Continue experimental replacement of physical grain distributions by direct cash transfers or DBT and expand and adjust in the light of experience gained. As suggested by the HLC, start with cities with populations in excess of 1 million, followed by grain surplus states. In grain deficit states and for the foreseeable future, enable entitled families to retain their preferred option as between direct distribution and a cash transfer.
- Continue to provide a food security reserve to be available in case of a food security crisis or incident. As parallel market reforms are implemented, procure at market prices.
- Allow the private sector to play a role in the constitution and management of stocks.
- Ensure that the amount of the NFSA benefit delivered through DBT is sufficient to fully compensate families now in receipt of the highest level of benefit under the TPDS.
- Construct the system to be able to increase payments quickly to the poorest families in the event of a sharp price rise and consider targeting payments to females.
- Where private markets are thin or non-existent and there is a risk that switching to DBT could worsen social outcomes, maintain the current food distribution system. Where leakages of payments might occur, an alternative food coupon system could be developed (along the lines of the US SNAP programme, previously food stamps), but conditional on it allowing recipient families to choose from a wider range of food items.

The research done for this report and much of the research done in India point in the same direction, as do the reflections of several commissions, government agencies and think tanks. Moving to a direct benefit system would bring savings, improve targeting, generate better nutrition outcomes, and could be designed to react more quickly than physical distribution to exceptional circumstances. It would also allow market signals to play a stronger role both in determining farmers' production choices and consumers' dietary choices. Reforms along the lines proposed would bring the added advantage that they would open some avenues for a satisfactory resolution of the "public stockholding" issue that has been an important factor impeding progress in the multilateral trade negotiations at the WTO. As with other reforms suggested in this report, timing and sequencing will be crucial, as changes will need to be carefully planned and gradually and progressively implemented over a period of time.

Making trade work for Indian agriculture

As with domestic market regulations, India's trade policy was designed with scarcity in mind and at a time when India's level of economic development was much lower than it currently enjoys. India is now a major agro-food exporter in a number of commodities. With growing imports and exports, a well-functioning and rules-based international

trading system is increasingly in India's interest – particularly if domestic productivity improvements are realised. The international food system is also changing, with a growing importance of global agro-food value chains. Agricultural trade policies more appropriate to the opportunities and challenges currently facing India are now needed to allow India to reap the benefits of further developing exports where it has comparative advantage and tapping into the potential of imports to contribute to diversification of diets, and as an important component of a multi-dimensional food security policy. Actions are needed on both the import and export side to enable India to participate in the development of value-chains in the agro-food sector.

India's growing participation in international markets for agriculture and food is making the role of international rules for sanitary and phytosanitary (SPS) measures and technical barriers to trade more important for the country. Aligning its policies throughout the value chain with those rules enhances India's access to foreign markets for its agriculture and food products. Applying the international rules on sanitary and phytosanitary measures and on technical barriers to trade in a transparent and consistent way to India's imports from other countries helps to ensure the safety of food for domestic consumption. It also enables international suppliers to contribute to the availability of food in the Indian market, thus moderating domestic price swings.

India adjusts the applied tariffs downward and permits imports when domestic supplies are tight, with a view to limiting price rises. Such decisions are made on a case-by-case basis. A more stable and open regime governing imports would permit the emergence of a multi-dimensional food security strategy combining domestic production in line with India's comparative advantage, an appropriate level of food security stocks and imports. In addition, it would accommodate demand for more diversified dietary patterns, in response to the needs of the growing middle class.

India's agricultural exports are also managed with a view to maintaining the domestic supply-demand balance and avoiding volatility. Many markets are subject to export restrictions of different kinds, or face the threat of restrictions if market developments, in the government's view, warrant it. These measures have been moderately effective in the short term in preventing sharp rises in prices, but have had detrimental effects on producers over the medium and longer term, as their prices have been lower than they would have been in the absence of restrictions. In essence, such policies have proved to be an expensive insurance against international price movements. In addition, India's reputation as a reliable source of rice and wheat, of which it is a major exporter, may have been damaged. Under the agreement made at the 2015 WTO Ministerial Conference in Nairobi, India will not provide export subsidies beyond the end of 2023. India should also renounce the use of, or strictly limit, any future recourse to export restrictions. Without a stable and predictable market environment, farmers and private traders will be unwilling to invest in the supply chains needed to ensure that India is a competitive, reliable exporter of agricultural products.

India's agricultural trade policy as implemented is characterised not just by relatively high barriers to imports and exports, but also by a significant degree of uncertainty. This explains, at least in part, why value chains in the food sector remain relatively under-developed. For India to develop a more sophisticated domestic processing and distribution industry and to more fully exploit its comparative advantage to export certain agricultural commodities, a more open and stable trade policy regime is essential, in the absence of which, the needed investment will not occur. State trading enterprises should be reformed as part of this process to make room for private sector development. Finally,

for India, as well as for many other countries whose food production is likely to be threatened by climate change, openness to trade will be a necessary component of the response, alongside the adaptation and mitigation strategies described elsewhere.

Recommendations

- Streamline and clarify trade policy roles and responsibilities across the different ministries and agencies to iron out inconsistencies and simplify procedures.
- Address a range of supply-side constraints in the application of SPS measures, including effective mechanisms for dissemination of SPS-related information among stakeholders in the value chain, as well as appropriate infrastructure and technologies.
- Reform state trading enterprises where they exist and make room for private sector actors.
- Reduce tariffs and relax the other restrictions on imports which are applied from time to time with a view to creating a more open and predictable import regime.
- Move away from the use of export restrictions in order to create a stable and predictable market environment, within which farmers and private traders will be willing to invest in the supply chains needed to ensure that India is a competitive, reliable exporter of agricultural products.

1.3. Conclusion

India's agro-food sector is at a critical juncture, facing multiple challenges and multiple opportunities. The policy directions embarked on now and in the next few years will play a huge role in determining how successful India is in creating food security for its vast population, improving the quality of life of its millions of smallholders, overcoming severe resource and climate pressures, while generating sustainable productivity growth and creating a modern, efficient and resilient agro-food system which can contribute to inclusive growth and jobs economy-wide.

First and foremost the fate of the agro-food sector will rely on supportive, predictable macroeconomic and structural policy settings and not exclusively on sector-specific interventions. Quality infrastructure, education and skills, well-functioning financial markets, strong market institutions, rule of law, excellence in innovation systems, and integration in global markets will be needed to create the sustained growth that will draw labour out of the sector, and create the conditions for the development of the sector itself. Particular attention may need to be focused on rural areas, which lag behind urban areas, according to many indicators of development and well-being. Agriculture and food policy settings also need re-alignment to reflect the changing nature of the sector's role in a fast growing economy with a significant and growing middle class, and India's expanding role and influence regionally and globally.

This report has revealed some incoherence in policy settings – some of them inherent in the way goals have been articulated, others in the way policies have been designed and implemented. This is starkly reflected in the PSE indicator estimated for the purposes of this study. It comprises significant positive transfers to producers mainly in the form of input subsidies and significant negative transfers to producers as a result of the prices for many commodities being lower than international benchmarks. While these transfers tend to cancel each other arithmetically in the value of the PSE indicator, they are cumulative in their distortive effects on the economy. There is a fundamental difficulty in trying to keep prices low for consumers while ensuring remunerative returns to farmers. Another

example relates to measures to resolve water scarcity which co-exist alongside subsidies for the electricity used to pump water which is wasteful use of scarce budgetary resources and may exacerbate the underlying problem. If the overarching goals of achieving sustainable productivity growth in the sector and ensuring food security are to be achieved, ineffective and wasteful interventions will have to be scaled back, and scarce public resources applied where they are capable of generating the highest returns for farmers and for the economy as a whole.

The costs and risks associated with a failure to align policies, and associated scarce budgetary resources, to the goals of food security, sustainable productivity growth and climate change adaptation are potentially large. Co-ordination towards a common vision is vital, so that shared priorities and policy efforts that respond to them can be developed. Governance arrangements around policy-making for agriculture and food are not very conducive to the creation of consistent and joined-up policy frameworks. In this respect, efforts could be stepped up to clarify roles and reduce fragmentation and overlapping. Stronger co-ordination mechanisms among Ministries, Departments and agencies would also be helpful, and between States and UTs and the central government.

Because of India's federal structure, the weight of the agricultural population in the total, the vibrancy of India's democracy, the pervasive nature of government intervention to date, and many other economic, social and cultural factors, particular attention will have to be paid to the political economy of efforts to change the focus of policies for the agricultural and food sector. *Inter alia*, this would require strengthening the institutional framework to eliminate duplication and fragmentation, considerable investment in forging consensus about shared goals and how to achieve them, including between the centre and the states, gradual and progressive dismantling of obsolete or inefficient policy instruments and implementation of new ones with careful sequencing, the development of strong transparency and consultation mechanisms involving a broad range of stakeholders, strong political commitment to maintain new policy directions once changes have been set in motion, continuous communication about intended next steps and monitoring and reporting of outcomes.

Against this background, this report suggests a series of reforms which, if implemented, would: create a modern institutional and regulatory environment in which market actors would play a much stronger role; would remove obstacles to structural adjustment and to the modernisation of processing and distribution; would enable the agro-food sector to respond to evolving market needs; would achieve food security more effectively and at lower cost; and would ensure that publicly funded programmes do not exacerbate environmental damage and climate change, or add to pressure on scarce resources such as water. Available resources would instead be devoted to (i) investments in innovation, climate change adaptation, resource conservation and infrastructure for sustainable productivity growth; (ii) transitional (digressive) direct support to farmers which could be integrated into the evolving DBT system using the Aadhar system for disbursement; and (iii) disaster programmes with triggers and payment conditions defined in advance and capable of rapid deployment.

The Government of India's own assessment concurs with many of the conclusions that have emerged from this report. In particular there is keen awareness of: the need to reform and modernise market regulations; to improve the prospects of smallholders including through adjustment out of the sector for some; improve the effectiveness of food security measures; and to deal with looming water and environmental degradation issues. Many policy initiatives are already underway or in the pipeline and are mentioned

throughout this study which endorses many of them and simply suggests that they should be continued or reinforced. Additional recommendations focus on shifting scarce budgetary resources to investments that will increase resilience and sustainability, while allowing better functioning markets to determine farmers' remuneration to a much greater degree. Finally, a less restrictive and more stable international trade regime covering both imports and exports is suggested, without which – in a world of global value chains – the potential of the sector to contribute to growth and jobs will not be fully realised.

Notes

¹ Different definitions can yield different sizes, income shares, or characteristics of the middle class population. Brookings Institution's middle class estimates consider the number of people living in households earning or spending between USD 10 and USD 100 per person per day (USD 2005 PPP). These are available for more than 130 economies. The share of the middle class population in India was estimated at 5% in 2010, 51% in 2020, and up to 79% in 2030.

² National data on employment are available from the National Sample Survey Office (NSSO), the Census, and the Labour Bureau of the Ministry of Labour and Employment. Some differences can exist between estimates across these sources, due to differences in the definitions used for compiling data. Most recent estimates (2015-16) are available from the Labour Bureau. When needed, for time and cross-country comparisons in this study, agriculture value added may include the primary sector, forestry, hunting and fishing.

³ NITI Aayog estimate for 2011-12 based on data from the NSSO for farm income per cultivator and non-farm income (NITI Aayog, 2017).

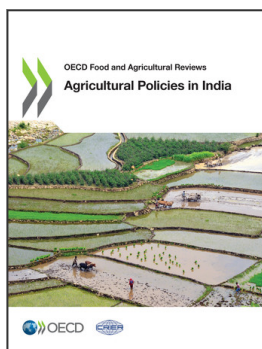
⁴ The 2016 Recommendation of the OECD Council on Water stresses that “the promotion of water use efficiency to alleviate pressure on all surface and groundwater resources, especially where water is scarce and competition between sectors intensifies, whilst taking into account the need for groundwater recharge and environmental flows” (OECD, 2016).

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