



Financing Sustainable Agriculture in India

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Abstract. Climate-resilient agriculture has mostly been financed by public funding ventures, which include state and central governments, and multilateral R&D finance institutions, through climate finance instruments such as grants, loans, and long-term equities. However, in the backdrop of a rapid pace of climate change and inadequate public resources for attracting private capital towards projects harping on sustainable agriculture, numerous alternate representations to entice private capital are being conceptualized. By bringing together time-tested instruments with risk mitigation options, we can strive to produce an attractive risk–return profile, which would subsequently boost the involvement of the private sector (“crowding in”).

As per the United Nations Sustainable Development Goals framework, SDG 2 (Zero Hunger) prioritizes sustainable agriculture. The clauses 2.3 and 2.4 of SDG 2 explicitly highlight productivity, resilience and sustainability. SDG 2.4 specifies marshalling investment towards resilient agriculture. Sustainable agriculture is also linked to other SDGs like reduction of poverty, climate change, water use, equality of gender, sustainable production, and consumption.

'Sustainable development' was initially coined by the Brundtland Commission as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs." Sustainable agriculture goes a step ahead and incorporates not only the environment but also the economic sustainability of agriculture producers and processes.

Ensuring the economic feasibility of small farming operations is an important issue in the larger scheme of things towards mainstreaming sustainable agriculture in developing countries like India. Being conscious of the prerequisite to prioritize sustainable finance, the Indian market regulator SEBI (Securities and Exchange Board of India) has made available disclosure necessities for green bonds, using groupings like “Renewable and Sustainable Energy,” “Energy Efficiency and Green Buildings” and “Sustainable Land Use.” The Ministry of Finance has created a Sustainable Finance Task Force encompassing regulators and pertinent ministries which would work in tandem with expert groups on cataloguing climate risks to create classifications and an outline aimed at achieving results for Indian agriculture.

Keywords: Sustainable Agriculture, Sustainable Finance, Climate-resilient Agriculture, SDG.

1 Introduction

The Indian economy is agrarian. Being the second most populous country with over 1.40 billion as of 2021, India also ranks as the sixth largest economy by nominal GDP and the third largest by purchasing power parity (PPP). However, the agricultural industry of India utilizes limited technology, due to which it contributes only 17-18% to its GDP (FICCI, 2018), despite employing 53 per cent of the population. A large number of people employed in agriculture is of a camouflaged nature, i.e., they appear to be employed but their marginal productivity is zero. Half of the Indian population engaged in agriculture is suffering from issues like obsolete equipment, poor infrastructure and lack of access to the markets. Though agriculture's share in the GDP has significantly shrunk since (14 per cent from a peak of over 50 per cent), it doesn't demean its significance to the Indian economy. Because, firstly, agriculture still is the largest employer (contributing over 60 per cent), and secondly, it is unique for creating demand in other sectors and is still an important indirect cog in the wheel of India's GDP growth. It is pertinent to note that agriculture has to sustain a growth of at least 4%; only then can the engine of the economy chug along at 9%.

Indian agriculture has long been suffering from numerous limitations such as outdated approaches to cultivation, dependency on rains, small and scattered land holdings, low-slung productivity, and minimal funding. Declining investments over a period have been the singular primary concern on agricultural performance. Insufficient formation of new capital has decreased the pace of technological interventions and development of infrastructure with opposing consequences on the productivity of agriculture. Achieving sustainable growth has become overbearing, especially keeping in mind the need to cater to the rapidly increasing demand for food and fibre for the bustling populace. Thus, the unavoidable urgency towards boosting agricultural investment. Augmenting agricultural production on a maintainable basis gains even more credence in today's unsure times of an ever-impending food crisis.

1.1 Investment in agriculture is primarily undertaken to achieve its potential by:

- a) enhancing natural resources
- b) increasing the effectiveness of utilizing prevailing resources
- c) stimulating value addition

Generating capital through investment in agriculture improves the means and productivity of natural resources, which, accordingly, encourages farmers to productively utilize their resources like land and labour. Thus, creating capital is a necessity for increasing the productivity of existing resources and realizing their lasting growth capabilities.

While energy contributes around 25% towards GHG (global greenhouse gas) emissions, AFOLU (Agriculture, Forestry, and Land Use) comes a close second at 21%. Agriculture remains vulnerable to climate change. AFOLU remains the leading source of livelihood for 58% of India's total population and is one of the major

contributors to global food security. Since independence, fertilisers and pesticides have been acknowledged as the main reasons behind the increase in farm yields; but these chemicals have proven to be harmful to soil health and groundwater, besides being a major cause for biodiversity loss. Thus, providing monetary support for transitioning to climate-resilient and sustainable agriculture is even more important.

2 Background – the constraints in up-scaling sustainable agriculture

- Difficult to invest huge capital owing to small scale nature of operations;
- Lack of structure for monitoring and evaluating the financial gains and impact consistently;
- Farmers are aware of the benefits of sustainable agriculture to the environment; but not of self
- Such projects are known to have long gestation periods, thereby making them a risky proposition. Banks are also hesitant to lend since the assets such as landholdings are not significant collateral. Furthermore, banks do not take into account climate-related risks while computing risks, which creates more obstacles in scaling it up;

3 The Advent of Climate Finance

Indian agriculture has been a success story explained in terms of the integration of supportive government policies, intensive research by field scientists and hard work by the farmers. From a country with the existence of 'ship to fork' in the fifties, India has graduated into 'farm to fork' (Swaminathan, 2006) through the vibrant green revolution. Indian agriculture is now not only self-reliant but also a major exporter of agricultural produce. India is the first, second or third lead producer of many agricultural commodities on the world scale. The Green Revolution marked a turning point in Indian agriculture. Since independence, India has spent almost two decades dependent on agricultural imports. The agricultural productivity of India observed a lethargy when the average production rate of wheat, rice, and food grains pummeled to 2.6%, 1.4% and 1.6% respectively from 1990 to 2010. This was because of stagnation in the yield of wheat, rice and food grains (average of 1.5%).

In 2015, the world came together in Paris to sign an agreement to address climate change. Since then, the focus on climate action has centered around how countries across the world deliver on these commitments. However, the majority of the countries, including India, are lagging in meeting their commitments. India and other developing countries are urging the richer and developed countries to revise the global climate finance objective, terming it the New Collective Quantified Goal on climate finance (NCQG), which they believe should stretch to trillions in sync with the escalating costs of acknowledging and adjusting to climate change. During COP27, India emphasized that climate actions to meet the NDC targets required

financial, technological, and capacity building backing from developed nations. The resource mobilisation headlined by these rich countries needed to be long-term, concessional, and climate-specific with unbiased provision for adaptation and mitigation projects.

As the world is fast descending into extreme climate events and resultant social and economic chaos remains a Grey area, the real problem is that the goals aren't ambitious enough. Even if India were to meet 100% of its Paris Agreement commitments, it would still not make a big enough dent in solving the emission problem arising out of living in a changed world.

With the sudden surge in the vagaries of climate change and the rush of the global community to arrest this seemingly unstoppable slide towards a spiralling downfall in natural resources and uncontrollable fluctuations in temperatures, Climate Finance has presented itself as a viable solution against these adversities.

As per UNFCCC, climate finance is funding sourced through private, public, or alternative sources that pursue the provision of planned and implemented activities towards climate change. It may be local, national, or multinational. Kyoto Protocol and the Paris Agreement set out to seek financial assistance from parties with more resources than those less able and more susceptible. Climate finance is essential for extenuation and adaptation because significant investments are required to substantially reduce emanations and reduce the impact of an ever-changing climate.

Although climate goals at the national level are formalized and prescribed, program execution happens at the provincial level; thus, the role of regional/grassroots players is critical in implementing the policies of the national government. A new study by the Centre for Energy Finance department of the Council on Energy, Environment and Water (CEEW) forecasts that India needs a further boost of USD 1.4 trillion by 2070 to achieve its target of net zero emissions.

With the landmark COP26 in the background and the considerable finance India needs to achieve its revised objectives, it is very critical to review perspectives and encourage participation from grassroots players. During COP27, India also sought clarification on the meaning of climate finance—the paucity of which encourages developed nations to interpret their finances as per their whims and define loans as climate-related aid.

India is one of the fastest progressing economies with the Green House Gas (GHG) emissions ranked at number three in the world (Timperley, J. 2019). A dossier on climate change valuation by the Ministry of Earth Sciences (MoES, India) disclosed that due to GHG emissions, the country's ambient temperature has shot up by 0.70 degrees Celsius between 1901 and 2018; and is projected to rise by 4.4 degrees Celsius by 2100 (Thomas. 2021). A briskly growing nation like India, which ranks in the top 5 on the Global Climate Risk Index, in 2019, intends to decrease GHG emissions by incorporating important milestones along a low carbon growth path, with robust climate laws and connotations.

The climate finance scenery in India is extremely incoherent. Well-articulated policies in the energy efficiency marketplaces, generated by national climate policy, have incited finance through a variety of public/private domestic and international outlets. The Government of India has launched a dedicated Climate Change Finance

Unit under the auspices of the Department of Economic Affairs in the Ministry of Finance. Gaining access to funding in this domain has majorly been via the project mode. The Ministry of Finance has been the primary recipient of monetary support via funding through bilateral and multilateral sources. There is a lack of prescribed synchronization of climate finance in India, but an array of national and regional stakeholders in the public and private domains help to define a path of opportunities by utilizing both domestic and international finance. Ministry of Finance, Govt of India estimates that it would require USD 2.5 trillion to implement plans for undertaking climate change measures between 2015 to 2030 (Thomas, 2021). India needs capital to ramp up its renewable energy capacity, build sustainable agricultural value chains, and create climate-resilient cities.

Generating funding solutions for employing climate-smart agriculture is the core requirement for addressing global food insecurity and poverty. The estimated investment needed into this segment based on India's INDCs as part of the Paris Agreement commitments, is US \$ 206 billion by 2030. While the country makes no similar commitments for mitigation investments, an estimated proportional 16% of the mitigation investment budget of US \$ 834 billion will be towards agriculture. That brings the total investment budget for agriculture to US \$ 340 billion by 2030. With the significant inflow of finance for establishing sustainable and climate-smart production systems, this segment can tap into massive fiscal likelihoods while achieving several of the UN SDGs.

4 Sustainable Development Goals (SDGs) as a useful framework

To better understand the social, environmental, and economic extents of resilient agriculture, Sustainable Development Goals provide a suitable context.



Fig.1: Sustainable Development Goals (SDGs) formulated by the United Nations (Source: <https://sdgs.un.org>)

Agricultural investment is carried out by both public and private sectors. Private investment efforts are concentrated more towards enhancing the productivity of natural resources or doing activities which add to a farmer's income, whereas public sector investment in agriculture concentrates more on building the required infrastructure. While the corporate sector investment is organized by corporate entities such as private companies and unorganized bodies such as co-operatives, the household sector funding, which has about 90 per cent of the share, encompasses investments in farm equipment, irrigation, land improvement and reclamation. Such investments support farmers in growing crops more intensively and taking a chance on non-conventional and high-value crops. Among other things, private investment in agriculture also depends on the accessibility of empowering infrastructure, investable resources, and a return on investment, which is dependent on the prices of agricultural inputs and output.

5 Sustainable agriculture financing models

Since the time we have known, grants, concessional loans, guarantees, and ultra-long-term equity have been the methods to implement climate finance. These mechanisms are structured to estimate returns at the project level. However, to attract private capital towards sustainable agriculture projects, several financing types have emerged, which include:

5.1 Blended finance – Viability gap funding

Lately, blended finance has become quite popular; and donors and philanthropists have acknowledged the rising requirement to invite private capital to address priority development issues. Blended Finance is defined as “the strategic use of development finance for the mobilisation of additional finance towards sustainable development in developing countries.” Blending public resources works optimally when identified market risks are greater than actual risks and it becomes vital to showcase commercial viability. It is beneficial when impacts on development are assessed over longer timelines than what is usual for investors. Blended finance stresses mobilising private finance rather than financing the private sector.

Worldwide some of the most popular blended finance instruments are:

Concessional equity (this includes first loss or junior equity capital, wherein the donor agrees to a high risk for a comparatively low return)

Debt (this includes senior or subordinated debt at concessional terms, with comparatively lower rates of interest and longer tenors than what the market has to offer)

Credit enhancement returns (including guarantees and insurance, which are essential for allaying the risks of commercial investors. They are further divided into the following-

- Partial risk guarantees (PRGs): instruments made to counter-guarantee commitments towards the public sector, especially in a public-private relationship;
- Partial credit guarantees: assure non-payment by the borrower on the ensured portion of the principal accompanied by due interest;
- Assurances that protect against losses due to risk arising from foreign exchange;
- Insurance instruments against political risk;

The Government of India-run Viability gap funding (VGF) is perhaps the most well-recognized and institutionalised blended finance mechanism in India. Some of the noteworthy schemes are:

- in wastewater treatment and solid waste management, sectors which historically have poor revenue streams and bankability, projects which cover their complete operational costs qualify for 30% of their total project costs as VGF
- for pilot projects and demonstrations in health and education sectors, projects which cover at least 50% of their operational costs are qualified for 80% of their capital expenditure and 50% of their operational costs as part of VGF
- for agriculture, setting up of additional storage infrastructure through a VGF instrument based on a public-private partnership model has been proposed via the budget of 2020

5.2 Venture Capital

VC is tailor-made for financing novelties in technology, advisory, and business models that are crucial for realizing climate resilience. The evolution of agritech is determined through easily accessible data and low-cost handsets which help companies to provide timely guidance on agricultural techniques, supervise/regulate supply chains, and create market linkages, thereby enhancing financial and climate resilience.

Compared with other types, VC is most suitable for sustainable investment. Firstly, VC funds have a comparatively longer lock-in period, which bodes well with the requirement of start-ups wanting to secure investment for a prolonged gestation window. Besides, these are also able to add value to such start-ups through the provision of technical knowledge, sector awareness and relevant skills, thereby generating more benefits from an economic perspective. This helps to commercialise new-age science and achieve the desired novelty required for promoting sustainable development and fast-tracking the obtainability of sustainable solutions, thereby bringing in numerous benefits, both environmentally and socially.

Secondly, VC provides unique investor protection procedures which are the need of the hour in the domain of sustainable investment, given its varied fears. Investments through VC are usually accompanied by rigorous and regular monitoring, and systematic processes to protect against uncertainty and disproportionate information. VC funds attain more control in portfolio companies and their role in the

process of making decisions is often overly greater than mere voting rights linked with equity holdings. Hence, VC fund managers are usually more involved in the corporate governance aspect of such portfolio companies, which gives an additional inducement for entrepreneurs to efficiently manage their companies and reclaim controlling rights.

5.3 Green Bonds – Social Stock Exchange

‘Sustainable investing’ addresses socially responsible investing opportunities. Green bonds are tradable debt instruments like traditional bonds but allotted for “green projects”. Green bonds are now a trademark for providing an approach to capital on environmentally friendly grounds, such as agriculture. Given the dominance of small farmers in South Asia, as well as regularly occurring situations of farm stress, the social development traits are of equal importance. In this case, social bonds, where the interest rates are linked to social development parameters, are essential instruments.

While presenting the budget for 2019-20, the Finance Minister of the Government of India hinted at an e-platform for raising funds termed as "Social Stock Exchange" (SSE), under the legal purview of SEBI, for listing voluntary and social establishments working towards the realization of a social welfare idea to raise capital as equity, debt or mutual funds. SEBI gave an in-principle approval on December 19, 2022, to the National Stock Exchange, and a subsequent final approval on December 27, 2022, for introducing SSE as a standalone distinct section on the Bombay Stock Exchange. The basic thought process behind this is that like investors investing in listed companies globally through share purchases, they would likewise finance social impact projects, thus making funds readily obtainable for the social sector. It is a striking proposition for an emerging economy giant like India which regularly faces trials on the development pathway.

6 Conclusion

Indian Agriculture employed ~45% of the nation's workforce and generated 17.5% of GDP with export earnings over US \$ 41 billion in 2021. Yet, finance is not meandering smoothly to the AFOLU sector, which calls for significant investment in projects which prioritize maintaining soil health, yields, and nutritional quality to meet the increasing demands of the population. Despite the government and development financial institutions continuing to play significant roles, generating investments from conventional investors is essential in gauging the scale of the challenge. Lack of financing from mainstream investors is severe for emerging economies, like India, where traditionally small landholdings of farmers make private investors reluctant to provide desired monetary sops.

Agriculture remains a state subject in India. While numerous Indian states have taken an initiative in promoting sustainable agriculture, others need to follow suit, like creating conducive conditions for mushrooming agritech startups; working with

multilateral agencies for strengthening capacities through extensive farmer training on sustainable methods; and mainstreaming blended finance via state development institutions. State governments could fund studies on the benefits brought about by sustainable agriculture practices as compared to conventional methods, thereby enabling greater acceptance within FPOs and institutions, besides additional research. With the assistance of government funding, non-governmental institutions could be facilitators to undertake and disseminate such research. Climate change has reared its head as one of the foremost challenges in our era, and the steady increase in investments supporting environmental, social, and governance concerns along with climate change issues confirm the increased acknowledgement by investors of the scenario that adequate capital can make the much-needed difference. Agriculture will remain an area that shall continue to have a substantial influence on climate change, and the huge gap that remains between the investor intention and the action needed to make a difference needs to be bridged.

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