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The logo for the International Institute of Social Studies, featuring the word "Erasmus" in a stylized, cursive script.

**The platform economy in agriculture: the  
interests at play when northwest Indian large-  
scale commercial farmers face platformization**

A Research Paper Design

by:

*Camila Meza-Cuadra Martínez*

MASTER OF ARTS IN DEVELOPMENT STUDIES

Major:

**AFES**

Supervisor:

Helena Perez Niño

Second Reader:

Oane Visser

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## List of Acronyms

AA	Advanced analytics
AMP	Agricultural marketplace
APMC	Agricultural Produce Market Committee
AWS	Amazon Web Services
BJP	Bharatiya Janata Party
BKU	Bharatiya Kisan Union
CGIAR	(formerly) Consultative Group for International Agricultural Research
CR	Critical Realism
DA	Digitalization of agriculture
GDP	Gross Domestic Product
GR	Green Revolution
GoI	Government of India
GPS	Global Positioning System
IT	Information technology
IMF	International Monetary Fund
IoT	Internet of Things
MoU	Memorandum of Understanding
MSP	Minimum Support Price
NeML	NCDEX e Markets Limited
PA	Precision agriculture
TNC	Transnational corporation(s)
UPA	United Progressive Alliance
US	United States
USD	United States Dollar
VC	Venture Capital
WTO	World Trade Organization

# 1 Introduction

The rise of the so called ‘platform economies’ has been mainly studied for urban contexts in the Global South. However, they are rapidly expanding in agrarian social formations (Brooks, 2021). Rural India is on the forefront of this development: in 2021 the state announced the creation of Agri Stack, a dedicated digital platform for agriculture, under the promise to double farmers’ income by 2022 (Paliath, 2022). Agri Stack uniquely proposes to combine public and personal data on landholdings, finances, production, and demographics to tailor private-led provisioning of agricultural services. With business partners such as Amazon, Microsoft, and Reliance Industries, the platform-based initiative is expected to revolutionize Indian agriculture (Rao, 2021).

The announcement and initial activities have already raised concerns about data privacy and the growing dominance of Big Tech over farmers. As the state hands private farmer data to powerful corporations, a potential conflict is preconfigured. Further, a closer look at the technological development in ‘platform capital’ reveals the proliferation of new business models and market architectures. Understanding the functioning of these platform-based technological packages is key to explaining how this fraction of capital will interact with agrarian actors and the tendencies that will be reshaping the rural world in the coming years.

The ‘platformization’ and digitalization of agriculture has been discussed by scholars who have warned that it reinforces rather than redresses existing inequality in agriculture (Kumar and Brooks, 2021). As with the Green Revolution, key assumptions are not questioned, namely the belief in the technofix and market-fix to respond to the demands of farmers (Brooks, 2021; Patel, 2013). A critical discussion of Agri Stack must look at who the winners and losers of the unleashed transformation will be.

The Indian case is striking for several reasons: the role the state is taking in platformization as market orchestrator and procurer of its development, the interest it has provoked among global Big Tech, and the reactions farmers have had to the announcement, especially led by those expected to derive the greatest benefit from digitalization of agriculture. To understand these reactions, it is necessary to understand the context in which this initiative is being rolled out.

Large-scale commercial farmers have had political ascendancy over the state and benefited from a political arrangement where their interests were protected. To understand what is at stake, this research will investigate the political economy of commercial farming in northwest India, as well as the business models in which Agri Stack is embedded.

## **2 Context and concepts**

### **2.1 Digitalization of agriculture**

Digitalization of agriculture (DA) refers to the expansion of digital technologies into all components of the agricultural value chain. Specifically, DA initiatives generally refer to the expansion of precision agriculture (PA) and connectivity services (Klerkx and Rose, 2020; McKinsey & Company, 2016; Mushi et al., 2022). PA can be best explained by the initial functions it occupied. It emerged in the 1980s in the United States, exploiting satellite and Global Positioning System (GPS) data to guide farming activity in operations that were too vast to be managed with traditional farmer knowledge (Babu, 2013). While in small operations a farmer can look at plants and observe what they need, in large operations advanced analytics software can make these recommendations with less labor input and more precision. Today, PA combines three groups of technologies: data collecting hardware (Internet of Things (IoT) sensors, drones, and satellite imaging), data analytic software (advanced analytics (AA), including machine learning or artificial intelligence), and implementing hardware (drones, pipelines, remote feeders, and tractors) (Babu, 2022; Ratnaparkhi et al., 2020; Molina-Maturano et al., 2021). Connectivity services on the other hand refers to digital platforms connecting farmers to input providers, additional services (credit, weather data, and other services), and outlets for their production.

While DA technologies have become the standard in industrial farming in the global North, their applications in the global South are only starting to be deployed (Stone, 2022; Brooks, 2021), with lighthouse cases such as GenIA in Ecuador and DigiFarm in Kenya (Vitapro, 2021; Brooks, 2021). However, the use of these ‘new’ technologies as a response to the needs of agriculture in the global South forms part of a larger private-led push for a technological fix. Wolf

and Wood (1997) explain that it is a turn of the Green Revolution (GR) towards digital technologies due to the environmental degradation caused by chemical-intensive modes of agriculture (characteristic of the original GR). Indeed, while some scholars have framed the GR in a time frame between the 1940s and 70s and speak of a Second Green Revolution (i.e., Glaeser, 2021), Raj Patel (2013) argues for a ‘long durée’ of the GR as the key mechanisms behind rural development initiatives remain.

The GR began as a coordinated effort between large philanthropic foundations spearheaded by the Rockefeller Foundation, first deploying a developmental program for agricultural productivity enhancement in Mexico (Patel, 2013). The GR soon grew out of Latin America, finding new opportunities in Asia. In this region the goal to solve hunger was joined with the urgent need to compete with communism by pushing ‘peasants’ into the market and to create new business opportunities for United States agribusinesses simultaneously (Brooks, 2021). The technologies of this first wave of GR were related to farming techniques and had a large focus on ‘improved’ seeds and farm inputs (pesticides, fertilizers, etc.) (Patel, 2013). The seeds were mostly of market-oriented varieties of crops rather than traditional varieties. Moreover, the use of privately distributed inputs, combined with market-oriented production, necessarily pushed farmers into the market, as they had to sell their crops to gain cash to afford these products (Patel, 2013). Further, to enter the new productive logic farmers had to use financial services, creating new markets for financial institutions that provided microcredit, insurance, and other products in previously untapped markets (Kumar and Brooks, 2021)

In the mid-2000s a new wave of the GR emerged in Asia and other global South regions as digitalization expanded. This wave was characterized by the new opportunities that connected digital platforms allowed: a bundled offering of all possible forms of ‘farmer support’ along every link of the value chain (Brooks, 2021). As Annan and Dryden (2018) point, farmers “need financial services, seeds, and fertilizer before they begin planting; after they harvest, they need storage, transport, processing, and marketing. Every step in this process can be an opportunity for entrepreneurial activity” (Annan and Dryden, 2018, in Brooks, 2021, p. 381).

If the first wave was marked by the influence of the Rockefeller Foundation, the second wave was marked the Omidyar Network, of Pierre Omidyar, founder of eBay. Omidyar Network operated legally as a US foundation and gave grants as such, but also had a Venture Capital (VC) wing that invested in high-tech enterprises with broad social missions, bridging a path into a much more aggressively private-led developmental sector (Kumar and Brooks, 2021). Brooks (2021) states the new wave is embedded in platformization and this is characterized by a value-chain approach that understands farmers of all scales as consumers of a privatized pipeline.

Has the DA benefitted farmers so far? Traditional development organizations including the World Bank, the United Nations, and the CGIAR have argued that the scaling of DA is a key opportunity to end rural poverty (World Bank, 2017; Santos Valle, 2020; CGIAR, 2017). Evidence on the real benefits to farmers is allusive and empirical studies disproving its power to improve farmers' incomes are beginning to emerge. Visser et al. (2021) have led empirical observations that proved the inadequacy of PA technologies for small-scale, labor-intensive farms. Wolff and Buttel (1996) have been claiming since the 1990s that the expansion of these technologies further relies of privatization, undermining the state's capacity and responsibility to invest in agricultural research and provide the services offered by DA (also see Oya, 2015). Further, the authors argue that DA prioritizes the interests of agribusinesses over those of farmers (Wolff and Buttel, 1996). Other authors have described DA as another presentation of the rural to urban metabolic rift (Ravis and Notkin, 2020). The several problematic assumptions of DA return to the absence of a serious questioning of the division of benefits and costs of technological advancement, characteristic of the technofix.

## **2.2 The Case of Agri Stack**

India is one of the countries in the world that is more rapidly adopting digital technology (McKinsey, 2019). While the number of internet users has been rapidly growing over the years, this growth is particularly evident in rural areas, with a compound annual growth rate of 10% between 2015 and 2018 (NITI Aayog,



2019). Aadhaar, a public project aiming to digitalize citizens' identity documentation, is the largest unique-digital-identity program in the world, with over 1.2 billion people (McKinsey, 2019). Further, it is the second country with most app downloads, cellphone subscribers, internet subscribers, smartphones, and social media users (McKinsey, 2019).

These achievements in digitalization may be attributed in no small part to government initiatives. Aadhaar is only one of several initiatives, interconnected to 'Digital India', a multi-sector program with an initial investment of USD 17 billion (Athique & Parthasarathi, 2020). Many smaller initiatives can be related to it, such as the National Agriculture Market (eNAM), a digital trading platform for agricultural commodities, and the eCourts, a judicial data grid, and many others (Ministry of Electronics & Information Technology, 2019). This forms part of a larger push towards digitalization of welfare characterized by multiple programs and initiatives (Jaspar and Sathyamala, 2022).

A telling milestone has been the publication of a national strategy for artificial intelligence (AI) with a focus on health, agriculture, education, mobility, and infrastructure in 2019 by India's public policy think tank, NITI Aayog (NITI Aayog, 2019). In agriculture, this strategy points at several opportunities for AI to improve agricultural economic activity and a key challenge to the deployment of these opportunities: the availability of data. A NITI Aayog report stated that the "[l]ack of open agriculture data standards has much of agri data stored in silos, which in turn is a key barrier to nurturing an agritech startup ecosystem in India" (NITI Aayog, 2019, p. 9). NITI Aayog (2019) thus proposed the development of a state-led set of common data infrastructure, with the proposed name of 'Agri Stack', also referred to as 'the Stack'.

Agri Stack has been popularized under the promise of DA services for farmers that would double their incomes (Paliath, 2022). These services would be enabled by the consolidating large sets of data from many diverse sources (NITI Aayog, 2019). The data included in Agri Stack can be grouped as personal information (e.g., demographic data, Aadhaar, bank account details); profile of land holding (e.g., maps, titles, geographic and climatic conditions); production details (e.g., crops grown, input and machinery purchase history, output specifi-

cations; historic quantities); and financial details (e.g., credit history, costs, returns) (Internet Freedom Foundation, 2021). The inclusion of citizen's Aadhar allows to connect all of this information creating a detailed view of each individual farmer. Reports have not been able to specify the limits of data sources in the Stack, which also includes welfare programs, satellite imaging, and numerous state-led digitalization projects. Prominent examples of these programs and projects are the eNAM, an electronic portal for commodity trading, and AgMark-Net, an information system that provides live commodity prices (Ministry of Agriculture & Farmers Welfare, 2018). Data goes back over 60 years (Paliath, 2022), and the extent of each set can be as large as the Agricultural Census, which alone contains data of about 138.5 million operational holdings (Ministry of Agriculture & Farmers Welfare, 2018).

In September of 2021, the government signed ten memorandums of understanding (MoUs) with private businesses and research centers to develop Agri Stack. Later in the year, 91 human rights organizations and farmer groups signed a letter demanding transparency and consultation for the development of Agri Stack (Shagun, 2021). Thus, the ten MoUs were published. The table in Annex I summarizes the agreements with the ten organizations, identifying 14 broad activities. From these documents, it can be inferred that the Stack will include (but may not be limited to) the following components: a website and phone application as interfaces for the other components; an agricultural marketplace (AMP) where farmers will be able to sell their products to procurers and buy farm inputs from suppliers; precision agriculture (sell or rent and installment of IoT sensors, AA models, and AI recommendations for production); advisory services with remote experts and external data use (such as weather information); logistic services and support for sales; maps development; data collection, warehousing, and analysis informing state agencies; credit and insurance evaluations and provision; evaluation of eligibility for government welfare programs; support for the development of new technological providers to join Agri Stack. These components may have a crucial impact in how agriculture is done and how the food value chains work. Thus, actors creating these components and providing these services will hold positions of power in these India.

Services crucial to the building of a digital platform can be grouped as ‘cloud services’. These focus on ingestion, storage, and processing of large volumes of data, the communication between devices and IoT sensors and the platform, and the structure for construction of new applications able to connect to the platform (Piyare and Lee, 2013). Different providers’ products are not incompatible, making many platforms able to use more than one cloud services provider (Jiang et al., 2020; Lovas et al., 2018). This is the case of Agri Stack. The Stack relies on two of the industry’s largest providers, Amazon Web Services (AWS) and Microsoft Azure, and indirectly relies on the third, Google Cloud Platform (GCP), as Google holds a 7.7% stake of Jio Platforms (Jio), subsidiary of Reliance Industries (Gupta et al., 2021; Dash, 2020; Annex I). Cisco and Patanjali Organic Research Institute (Patanjali) also provide these services (Ministry of Agriculture & Farmers’ Welfare & Cisco, 2021; Ministry of Agriculture & Farmers’ Welfare & Patanjali, 2021).

Cloud services are the central activities in the MoUs with AWS, Microsoft, and Cisco (Ministry of Agriculture & Farmers’ Welfare & Cisco, 2021; Ministry of Agriculture & Farmers Welfare & AWS, 2021; Ministry of Agriculture & Farmers’ Welfare & Microsoft, 2021). Depending on the size of the platform, these services are offered at prices that may vary from hundreds of thousands to millions of USD, as AWS pricing calculator shows (Amazon Web Services, no date). Yet, Cisco’s agreement is the only one to state the company will provide these services without charge for the first year (Ministry of Agriculture & Farmers’ Welfare & Cisco, 2021). This suggest a high level of enthusiasm among Big Tech companies to join the Stack, having the least competitive actor of the group offering to join at a loss to be part of it.

Platforms, as digital spaces connecting different actors, rely on large networks of providers and buyers (Srnicek, 2017). Beyond being a cloud provider, AWS takes on a role as a procurer of providers for digital technology development and farm applications, according to the MoU (Ministry of Agriculture & Farmers’ Welfare & Amazon, 2021). AWS further commits to deploying a program aimed at supporting the development of local startups for them to join the Stack. The MoU states part of this role includes “connect[ing] other potential startup ecosystem members such as [venture capital funds] & impact investors” (Ministry of Agriculture & Farmers’ Welfare & Amazon, 2021, p. 8). These are

bottleneck roles, as most companies will have to go through AWS to join the Stack. Cisco also commits to startup development and linkage to the Stack (Ministry of Agriculture & Farmers' Welfare & Cisco, 2021).

The second company taking a role as procurer is Ninjacart, an Indian online grocery retailer majorly funded by Walmart's majority-owned Flipkart (The Economic Times, 2021). The startup is rapidly growing since its launch in 2015 with funding from Walmart and other investors (The Economic Times, 2021). At the time of signing the MoU, the government stated the company operated in 11 cities (Press Information Bureau of India, 2021). A month later, Thirukumaran Nagarajan, Ninjacart's co-founder stated they had gone from 11 to 50 cities and changed their focus from provision of groceries to consumers, to being a technological provider of data science to produce efficiencies in sourcing and delivery (Kaur, 2021). Nagarajan further stated "the sourcing and distribution of produce from farm to fork are controlled through data" (in Kaur, 2021). The company's role in grocery e-commerce thus becomes all-inclusive beyond traditional retail activities.

The agri-marketplace (AMP), key component of Agri Stack, will provide farmers an outlet for their production and a marketplace for inputs and services, making farmers both buyers and sellers of the platform. Ninjacart's role is focused on the development and launch of the AMP. This includes the procurement of new providers, a position of power in the Stack, and the on-boarding of already selected providers (these include farmers, truck operators, traders, and minimum support price (MSP) buyers) (Ministry of Agriculture & Farmers' Welfare & Ninjacart, 2021). On-boarding of actors into the platform is a relevant activity in the roles of several partners of the Stack (see Annex I). The direct contact with farmers and other businesses in the value chain is bound to strengthen the links between these actors, a desirable effect for companies interested in expanding into new rural geographies. The MoU further states Ninjacart will launch the Stack's pilots in districts where the company is not yet operating (Ministry of Agriculture & Farmers' Welfare & Ninjacart, 2021), suggesting the company's interest on joining the Stack is another rapid expansion strategy.

The AMP is further built by three companies, according to the MoUs published (see Annex I). NCDEX e Markets Limited (NeML) is the second

company. The MoU places NeML as a key orchestrator enabling the AMP with analogue services such as warehousing, cooling facilities, packing, credit, and public welfare schemes. It further gives the company a negotiating role with MSP procurers (see chapter 5), and farmers organizations (Ministry of Agriculture & Farmers' Welfare & NeML, 2021). NeML states, "our financial linkages module "e-Pledge" links the client, warehouse and bank together to enable e-pledge against the commodity deposited" (Ministry of Agriculture & Farmers' Welfare & NeML, 2021). The third developer of the AMP is Agribazaar. The Indian company known for its agricultural inputs marketplace, will host the platform on their servers. It will further join the eNAM and other services from the Government of India (GoI) (Ministry of Agriculture & Farmers' Welfare & Agribazaar, 2021).

Perhaps the most advertised elements of the platform are the several data-based advisory services including input (fertilizers and pesticides) use, farm management, land usage, harvest timing, weather forecast reactions, among others (Paliath, 2022; Shagun, 2021). Jio's role is anchored in these direct farmer services. The company places itself in the hardware provision of IoT sensors in farms (sensors may collect data on soil fertility, nutrients, irrigation, pests, plant growth, etc.) along with ITC, a highly diversified Indian company participating in the production of consumer goods, technology, as well as tourism and agriculture. Jio and ITC, along with Patanjali, further focus on the development of DA applications software (Ministry of Agriculture & Farmers' Welfare & Jio, 2021; Ministry of Agriculture & Farmers Welfare & ITC, 2021). Esri India (Esri) also joins this group with a more focused role on geographic information-based services and the creation of a 'Geo Hub' (Ministry of Agriculture & Farmers' Welfare & Esri, 2021).

Patanjali has a further focus in providing services to the Ministry of Agriculture & Farmers Welfare based on the platform's data. These include a data warehouse, a data dashboard, and data analysis of the "socio-economic landscape of farmers across India" (Ministry of Agriculture & Farmers' Welfare & Patanjali, 2021, p. 8). These services are also listed in smaller measure in MoUs with AWS, Microsoft, Jio, Cisco, and Agribazaar. Agribazaar's role includes "agri-land profiling [and] crop estimation using remote sensing technology"

(Ministry of Agriculture & Farmers' Welfare & Agribazaar, 2021, p. 8). This includes land usage, soil fertility/degradation mapping, and yield estimations of farms in the Stack (Ministry of Agriculture & Farmers' Welfare & Agribazaar, 2021). The use of the Stack to develop government and private sector surveillance of farms is thus a well-funded fear of farmers and human rights groups (Paliath, 2022).

Other activities in the Stack include the scoping, development, and deployment of pilots of different elements in several villages across the country. Being part of these provides an initial advantage to companies involved. Communication and publicity of the platform are also large activities. They include marketing campaigns, events, and academic publications. Other activities include technical advisory for the platform's development, and program management and governance. These activities are outlined in several MoUs and will most likely be part of the activities carried out by all partners as they put forward their business models (see Annex I).

## **2.3 Farmer reactions to Agri Stack**

From its announcement, Agri Stack was met with resistance by farmers (Shagun, 2021). The announcement of Agri Stack as well as the publishing of its MoUs happened at the time of the farmer protests against the Three Farm Laws (see chapter 5). Thus, reports on farmer responses to the Stack and the Farm Laws are difficult to differentiate. A significant protest, however, happened before the Stack was announced. In December of 2020, the Bharatiya Kisan Union (BKU) led the attack on Reliance Jio's telecommunication towers, destroying over 1,500 (Jagga, 2020). The leaders denounced Jio of attempting to take over agriculture, buying land, and having a corrupt link to the BJP government (Roa, 2020; Jagga, 2020).

The BKU, also known as the 'rich farmers lobby' for its leadership composition of large-scale commercial farmers (Jeffrey & Lerche, 2000), is considered a radical farmers organization (Lerche, 2021). The union is a member of La Via Campesina. Their influence in the movement in India has been relevant to stalling discussions on land reforms and prioritizing demands for government

investment and beneficial trade conditions (Edelman & Borrás, 2016). The BKU is a prominent political force in northwest India and the country in general due to their demographic voting power (Brass, 1995). Thus, their support for the Bharatiya Janata Party (BJP) in the 2014 elections was important, and their pledge to vote out the party in 2024 is relevant as well (Lerche, 2021). While the BKU may be known to represent large-scale capitalist farmers, their ability to mobilize large groups and claim the representation of minorities has been proven in the protests against the Farm Laws (Lerche, 2021).

The BKU, along with other 90 organizations signed a letter addressed to the Ministry of Agriculture and Farmers' Welfare protesting Agri Stack (Alliance for Sustainable & Holistic Agriculture, 2021). The group demanded a consultation process and the suspension of Agri Stack's activities until the process is carried out, as well as raising 11 concerns. Among these, it stated, "there are no mechanisms to ensure that the economic interests of farmers are ensured whereas the revenue models that will be adopted for entities getting involved in this ecosystem are predictable" (Alliance for Sustainable & Holistic Agriculture, 2021).

The letter did not delay the plans for the Stack. Pilots are beginning to be deployed and farmer reactions are only starting to emerge from their specific interactions with the platform. The newspaper *The Citizen*, interviewed Siddharth Rana, owner of a beneficiary farm. Rana was onboarded to the platform and his farm was photographed. He reports,

First, the whole process is faceless. If something goes wrong, it will take dozens of phone calls to address my issues. Second, I don't have as much negotiating power as I do in the market. There are many more factors at play during a physical negotiation than just 'data'. In Covid times, I am okay with using the internet. But I hope this doesn't mean the end of 'normal mandi.'

(Siddharth Rana in Saha, 2021)

Rana's words portray initial worries of a destruction of the current regulated trade system as well as the loss of power. An investigation of what is at stake for farmers as Agri Stack is deployed becomes crucial.

## 3. Framing the research project

### 3.1 Research problem

DA is rapidly expanding (Fraser, 2019; Brooks, 2021; Oya, 2015). While it has raised productivity of some, it has not addressed inequalities of agrarian structure in the global South and thus perpetuates them (Brooks, 2021; Kumar and Brooks, 2021). A turn of rural development efforts towards a private, high-tech led one implies the retrieval of state protections (Oya, 2015; Jaspers and Sathyamala, 2021). Further, the rise of platforms in every sector is linked to new business models and business architectures that must be investigated (Srnicsek, 2017). The tendencies they entail have been mostly studied in urban areas and in the global North (e.g., Veen et al., 2020; Hamal and Huijsmans, 2021; Thelen, 2018), but they are rapidly expanding into the rural world of the global South (Brooks, 2021). Agrarian change is inevitably bound to be unleashed with the rise of these technology packages. How will the rural world change with the rise of the ‘platform economy’?

The Indian case is unique for several reasons. The speed of digitalization in the country implies the initiative is bound to be scaled rapidly, transforming a vastly populated territory. Further, the amount and diversity of data involved becomes a large opportunity for platform-based business models, as these are driven by the exploitation of data (Srnicsek, 2017). It is thus, no surprise that some of the largest Big Tech actors have already joined the initiative directly or through partners (e.g., Microsoft, Amazon, Facebook, Google, Cisco) (Internet Freedom Foundation, 2021). The potential for agrarian change AgriStack holds is elevated by these factors.

Further, the characteristics of the group leading responses raises a new level of complexity that extends beyond the debates of the scale adequacy of DA. This sheds light on the need to step back and look at the different fractions of the capitalist class involved and the interests at play in this clash. Thus, political economy research on DA must engage the problematique of the technofix and of the market-fix in contemporary agrarian development efforts.



## **3.2 Research questions and objectives**

### **Research question**

How does platform capital encounter and collide with agrarian capital in northwest India?

### **Sub-questions**

How does platform capitalism business models and market architectures in which Agri Stack is embedded work?

How does the political economy of large-scale commercial farming in northwest India define material interests at risk with the encounter with Agri Stack?

How has the Government of India influenced this scenario of confrontation of fractions of capital?

### **Research objective**

Explain the configuration of interests in the transition to platformization in rural northwest India

### **Secondary objectives**

Explain the business models and market architectures in which Agri Stack is embedded

Explain the political economy of commercial farming in northwest India

## **3.3 Relevance and justification**

Karl Polanyi (1944) explained that capitalism emerged when societies took elements that were outside of the market (i.e., labour, land, and money) and turned them into commodities, goods that could be exchanged in the market. Scholars have argued that the 21<sup>st</sup> century has been marked by the creation of a new ‘fictitious commodity’: human behavior (Zuboff, 2019; Grabher and König,

2020). By commodifying human behavior, we are changing it the way we drastically changed nature when we commodified land and economic relations when we commodified labour (Zuboff, 2019). This research paper aims to contribute to the literature that intends to explain this fundamental and encompassing transition.

Moreover, the Indian case study opens the possibility to situate the debate on agrarian change, an area where literature on platform capitalism is only starting to be developed. The case at hand represents several opportunities to influence the transition pinned by the responsiveness and organization of agrarian actors, and threats, as the initiative is characterized by massive scale and the inclusion of some of the most aggressive corporate actors worldwide. The impact of Agri Stack and digitalization in India will mark the future of nearly half of the workforce of the second most populated country in the world (McKinsey, 2019).

### **3.4 Scope of the study**

This paper will discuss the business model and tendencies of platform capital in agriculture. To do so, it looks at the tendencies at play in platform business strategies. It then investigates the political economy of commercial farming in northwest India and the drivers of large farmers resistance to Agri Stack. The paper sheds light on the interests of the farmers in Punjab, Haryana, and Western Uttar Pradesh (also known as northwest India) in the debate, distinguishing between different groups and focusing on the large-scale commercial farmers. The geographical focus has been chosen following states where the reaction against AgriStack was more severe and states that concentrate productive dynamism in agriculture and a more developed process of class formation. To explore the interests of these groups, this research will include an investigation of their history and, in particular, their relationship with state protection.

For the purposes of this paper, the term ‘large-scale commercial farmers’ refers to the group of agricultural producers in northwest India. This fraction of capital is defined by three characteristics related to their type of work and relation to the market. These farmers engage in production (as supervisors, farm

managers, or workers, while not as remote landowners), they produce surplus traded in the market (both for domestic consumption and exports), and they control and accumulate of the means of production (by ownership or secure leasing). As such, they employ agricultural workers and they accumulate capital through time. This follows Carlos Oya's (2007) definition of agrarian farmers in Senegal. By Oya's definition, this category engages in 'entrepreneurial activity' to raise margins and accumulate capital. This includes "mobilize[ing] labour at very low cost; [and using] surplus to expand the range of activities in order to reduce risk and adapt business to seasonality" (Oya, 2007, p. 468). This differentiates this category from 'petty commodity producers' and peasant laborers. For Oya (2007), agrarian capitalists are not strictly defined by spatial terms such as hectares of cultivated land or metric tons of production, due to large variations. So is the case of large-scale commercial farmers in northwest India.

This research project focuses on this group of farmers, who's development trajectory is further explained in chapter 5. This choice responds to 3 key motives. Firstly, the diverse class interests of different farmer groups make it unhelpful to treat (all) farmers as a homogeneous group and the limited scope of this research project does not allow to delve into all of these groups in depth. Secondly, large-scale commercial farmers have a key role in recent responses to liberalization attempts and responses to Agri Stack (Paliath, 2022; Shagun, 2021; Babones, 2021). Thirdly, the interaction of platform capital with this group remains an open question. There is an extensive literature in agrarian studies that discusses the threats for smallholders and peasants of the capitalist expansion as the production of agricultural commodities expands and as the GR and DA reaches new locations (i.e., Brooks 2021; Patel, 2013). Often, this encounter is framed under David Harvey's concept of 'accumulation by dispossession' (i.e., Cáceres, 2015). Further, rich empirical studies disproving 'scale-neutrality' of technologies have successfully explained how DA expansion tends to create more costs than benefits for smallholders (i.e., Visser et al. 2021).

This project aims to shed light on the moments of agency that emerge in the encounters of different fractions of capital. This work further contributes to the literature on the role of the state in agricultural development and on the disputes of different fractions for state sponsorship and hegemonic control. This work has the ambitious task of exploring a recent case starting to be deployed at

the time of writing. Therefore, the observable impacts of it are so far incomplete and can cloud the analysis. Additionally, the paper strives to move beyond these observations as they may only give a partial view of the tendencies of platform capital and the potentials of this initiative.

Further, the paper will not investigate in depth the claims of the farmers. While the interests of farmers are crucial, the claims raised during these preliminary struggles may be marked by factors external to the material conditions this work is interested in. Namely, these claims may be marked by misconceptions of the working of platform capital and by general mistrust on the current government of India, led by the Bharatiya Janata Party (BJP). Escaping a focus on ideational analysis of discourse, this research focuses on the material interests being disputed.

### **3.5 Methodological design**

This research uses with Critical Realism (CR) as a meta theoretical framework. CR understands reality as stratified, differentiating the ‘real’, ‘actual’, ‘empirical’ stratus of reality (for a detailed explanation see Vincent and O’Mahoney, 2018). Methodologically, it goes beyond empirical correlation of events thus producing explanations rather than descriptions. Further, it moves away from discursive analysis, then shedding light on social structures, historical processes, and resistance and struggle interacting with these (Vincent and O’Mahoney, 2018). It is developed as what Ackroyd and Karlsson (2014) call ‘generative institutional investigations’, which “extends into the consideration of the historical conditions and sequences of change leading to the emergence of a given generative mechanism” (p. 34). Thus, rather than producing generalizing arguments, it discusses unique outcomes of historically connected contexts and generative mechanisms (Ackroyd and Karlsson, 2014, p.33). Further, the strategy relies on both a historizing and an analytical effort to carefully relate both components of the investigation.

Consistent with CR, this research recognizes that there is a ‘real’ world independent from the observer, but human beings may only understand it through limited and different minds. Therefore, this paper does not aim to build

positivist assertions of universality. Contrarily, it is reflexive of the situatedness of knowledge production. As a non-Indian student from Peru, the researcher remains a foreigner, external to the area of research and thus potentially attributed detachment and limited experiential understanding of the local context. The researcher's professional experience includes working with platform capital in agriculture during design phases, having participated in decision-making meetings with executives. This experience may give the researcher an ability to make an informed critique of the business strategies at play but may also be an obstacle to the commitment of proving every statement, as much is internalized.

This research consists of a historical and analytical desk-based exercise. The sources on which this work is based are mainly news articles, political economy texts based on data, government reports and publications, and business reports, as shown in Annex II. Aiming to answer the proposed research questions, this paper collects information on two sides of the observed encounter, as well as on the state as a third actor.

On the side of farmers, this research constructs a historical account to investigate how large-scale commercial farmers in northwest India have increased and decreased their wealth through time. Then, an analytical exercise takes elements from these actors' past to understand how the launch of Agri Stack as well as other contemporary events may exert pressure over farmers' economic activities. Further, it reviews farmer responses to Agri Stack, demonstrating the insights reached in the analytical exercise. On the platform side, this paper reviews the more recent history of platform capitalism in India; explores contemporary phenomena marking its presence; and investigates the emergence of opportunities and reactions of platform businesses to further understand the economic rationale of these businesses' actions. Furthermore, this research looks at the changing role of the state in relation to the agriculture and technology sectors. It exposes the ramifications of Agri Stack and other related government initiatives and policy changes, as well as broader developments in contemporary capitalism in India and globally.

News articles from national and international media are key sources as they shed light on the debates around government initiatives the complex reactions of different farmer groups to changes, the arrival of new business actors into rural India, and the strategies these actors take to compete. However, a limitation of these sources is the lack of a sharp distinction between responses to Agri Stack to that of the 2020 Farm Laws, as well as the use of different categories of farmer groups. Thus, this paper's ability to amplify the voices of large-scale commercial farmers is limited and does not emerge as the key contribution of this work. Yet, voicing farmers' understanding and opinions on Agri Stack may be an avenue for a continuation of this work beyond the scope of this research paper.

Political economy literature on different historical moments further illuminates the formation of the fraction of capital represented by large-scale commercial farmers in northwest India, as well as the transformations of the role of the state. This project reconstructs historical processes based on the work of renowned authors. Further, through the analysis of contemporary literature, this research provides a contemporary economic analysis of the systematic actions of platform capitalist companies. Yet, this literature does not delve into the agriculture sector. Thus, this paper's contribution includes the application of this literature to the rural sphere.

A third key resource this paper has relied on have been government publications. Several publications, reports, and government websites have been reviewed in this research, including government digital welfare initiatives websites and Agri Stack documentation. These have been analyzed to expose the government's stance on agricultural and platform issues and its commitments to actors involved, as well as to derive insights from the events that led to decisions such as the launch of Agri Stack.

Lastly, business reports have been a pivotal element introduced in this research. Multiple reports and publications from top management consulting firms have been analyzed. McKinsey & Company, Bain & Company, and the Boston Consulting Group, also known as 'The Big Three' or 'MBB', advise the largest companies globally in virtually every sector as well as governments and nonprofit organizations. The expertise developed and collected allows them to

make predictions on changes in market dynamics and business opportunities. Further, these firms confidentially advise the largest companies (in several sectors including agriculture, agritech, and technology) and have rotating doors with them. For example, in 2003 Shona Brown left her position as partner at McKinsey & Company to run Google’s strategy in different positions for over 10 years (Code for America, no date). Thus, this paper has analyzed these documents to illuminate the private sector’s contemporary view of agriculture and envisioned future based on opportunities identified. Further, these texts have allowed to follow the opportunities and pressures identified by these consulting firms and the response strategies suggested for companies such as the partners in Agri Stack and government officials designing the Stack.

Overall, this research paper covers an extensive literature providing an innovative application of political economy research methods to platform capitalism and agrarian change. It provides several insights on a contemporary transformation, setting out to respond to urgent and important questions. While there may not yet be substantial evidence to answer them, it remains important to do so. This research takes on this challenge. Thus, several of the insights provided are speculative although supported by suggestive evidence. This is a challenge of any study of contemporary transformations. As Nick Srnicek (2017) has explained in his study of platform capitalism, while answers may be speculative, they are an important guide. This research’s contribution is a start in providing these answers for the expansion of platform capitalism in the rural global South.

## **4. Framework of the Analysis**

### **4.1 Platform capital**

Agri Stack proposes the creation of a ‘digital ecosystem’ (IDEA, 2021). This term has widely been used by corporate actors and scholars interchangeably with platform-based businesses (Pidun et al., 2020). Srnicek (2017) defines platforms as “digital infrastructure that enables two or more groups to interact” (p. 57). Common examples of platforms are social media apps (e.g., Facebook), online marketplaces (e.g., Amazon), and service sharing apps (e.g., Uber), but they extend into industrial sectors with large actors like John Deere who provide

intermediation as well as products and services themselves. Indeed, varieties of platforms provide, to different extents, their own products and services either sold or for free to attract users (Srnicek, 2017). Van Dijck (2013) further states, “platform intermediation is distinctive because it attempts both to make the ‘connections’ of multi-sided markets and to coordinate the network effects of ‘connectivity’” (in Langley and Leyshon, 2017, p. 3).

The rise of platform-based businesses in all sectors has raised concerns around the world (Thelen, 2018; Veen et al., 2020; Hamal and Huijsmans, 2021). As key platform actors grow their user base and profits at previously unimaginable rates, understanding their novel business models and the market architecture that has been created with them becomes key in understanding the economic transition they involve. This section (and Chapter 7 of this research) lays out the working of platform-based businesses in order to illuminate on their tendencies and why they come in conflict with the interests of agrarian capital.

Data is key in platform businesses. The exploitation of data has been described as the creation of a new ‘fictitious commodity’, in a Polanyian manner (Grabher and König, 2020). Karl Polanyi (1944) explained that capitalism emerged when societies took elements that were outside of the market, labour, land, and money, and turned them into commodities, goods that could be exchanged in the market. Zuboff (2019) argues the new age of capitalism is marked by the commodification of human behavior (‘data’ being traces of the previous), changing it drastically. As data on human behavior is sold in the market, companies use it to change human behavior (with changes ranging from shopping choices to acts of civil disobedience and voting behavior). However, Srnicek (2017) explains that while data is the key resource of platforms, selling it has not been the leading innovation explaining its outstanding growth. Instead, with the growth of the internet into every economic sector during the late 2000s as an indispensable source of competition, data analytics became more and more crucial to every business attempting to compete. However, high-tech providers were struggling to get a hold of data in traditional production systems that never gathered it before. Thus, platforms emerged as a business model capable of intermediating economic transactions in any sector while gathering large amounts of data that would then be used for companies in these sectors to compete in their traditional economic activities (Srnicek, 2017).



Perhaps the most crucial characteristic of platforms is their ‘natural’ tendency to monopoly as a key requirement for success. Platforms generate profit through ‘rent’ extraction of economic circulations in their marketplaces and data traces that are turned into behavior futures (see Langley and Leyshon, 2017). To ensure rents, platforms must grow. The most convenient platforms to users are those with the most users (consumers and providers), thus creating a virtuous cycle. For example, a food delivery app with many consumers attracts many restaurants and this greater offer attracts more consumers. This makes up for a logical (or natural) monopolistic tendency (Srniczek, 2017). The ‘winner takes all’, popularized by consulting companies, explains the urgency of creating digital ecosystems and expanding before the market is taken over by another firm (e.g., Pidun et al., 2020).

To secure this monopolistic position platforms engage in gatekeeper behavior, “locking [users] in through various measures: dependency on a service, inability to use alternatives, or lack of data portability, for instance” (Srniczek, 2017, p. 139). By luring consumers in through aggressive strategies (e.g., outstanding first purchase and referral discounts), platforms drive competing businesses and services out of the market. For example, as more consumers turn to food delivery platforms, less are willing to call restaurants directly, therefore, to sell food by delivery, restaurants must join and eliminate their own delivery services. Further, platforms secure control of key links of the value chain. Srniczek (2017) argues that platform capital does not benefit from having activities in the entire value chain as happens in Fordist vertical integration, nor from appropriating entire stages as in horizontal mergers. Platform capitalists benefit from controlling key, strategic, data-generating positions working as bottlenecks (Srniczek, 2017).

Another crucial element that distinguishes the behavior of platform businesses to others is that they are typically funded by Venture Capital (VC) (Langley and Leyshon, 2017). But how do VC investments work? Three key aspects can be recognized: high-risk, high-investment, and medium-termism. VC emerged in the 1970s in the United States and continues to play a crucial role in scaling of innovation and technology because of lack of other funding options (Mason, 2009; Zider, 1998). Zider (1998) explains that the kind of enterprises VC funds require investment too large for self-funding and too risky for financial

institutions to give loans. The interest rates these companies would require are illegal due to limits set in usury laws (Zider, 1998). VC invests not in the initial stage of innovation but in the ‘adolescent’ stage, when they have a proven technology that promises to generate large returns if successfully scaled. Thus, VC becomes ideal for platform funding. However, only 10-20% of VC investments are expected to generate the extraordinary results they set out to achieve while the same amount become complete losses (Mason, 2009; Zider, 1998).

While the expected return stage is between 7-10 years for most VC funding (Zider, 1998), this does not contribute to a long-term view of the business due to the way VC investors make profit. In short, they must sell their investment to make returns either by reaching the state of selling shares in the stock market, by selling the entire company to another company, or, less often, by selling their shares to secondary investors. Thus, investors do not have an interest in the long-term sustainability of the company. Further, investors in VCs are not like banks, (by contract) they are key decision makers, and they hold seats in the board (Mason, 2009; Zider, 1998), making these medium-term goals heard. Moreover, VC funds align management to their interests of scaling fast and selling out through low fixed wages and stock options. For platforms, growth is often valued in users and data points for the first years, while revenue is assumed a future result of user growth, allowing for frequent rounds of investment, cross-subsidization, and other expansion strategies not available for regular firms (Langley and Leyshon, 2017). Altogether, these funding conditions make platform capitalists voracious actors with highly aggressive strategies.

All the discussed characteristics make platform capital powered to bypass any regulation or social norm in place in order to expand profit margins, user base, and data collection. This behavior is displayed to such extent that platform capitalists have gone into the custom of constantly apologizing for boundary-crossing and continuing with it, as shown by Mark Zuckerberg’s over ten public apologies for privacy breaches by 2012 alone (Bilton, 2012). This practice has made the slogan “ask for forgiveness, not permission” an “industry best practice”, as described by David Morin, CEO of Path, after the app was found to be “copying address book information from users’ iPhones without notifying them” (Bilton, 2012). Indeed, Srnicek (2017) argues that these firms often display a strategy to push the limits of legality and acceptability and “apologize and roll

back programs if there is an uproar, rather than consulting with users beforehand” (p. 130).

This bypassing behavior can be seen in the widespread precarization of labor characteristic of the ‘gig economy’, spread by platforms (Langley and Leyshon, 2017; Thelen, 2018). By pushing new contractual and managerial arrangements, platforms like Uber have been able to completely bypass labor regulations including minimum wage, social benefits, safety conditions and even tax responsibilities (Thelen, 2018). These companies may argue what they do is remove information asymmetries and transaction costs, improving competition. And they do in some ways: platform contractors (such as Uber drivers) bid for work in the system, so they join a race to the bottom, lowering their pay rate radically (Langley and Leyshon, 2017). On the other hand, they are also able to evade other problematic regulation, such as scarce work permits for immigrants, giving them access to making a living (Thelen, 2018). Thus, one can observe that the bypassing behavior is problematic specifically in industries that depend on regulation and may be beneficial in those who are restrained by them.

Far from being objective, passive actors improving competition, platforms take on the ‘orchestrator’ role, setting the rules of the game and defining the activities that will take place. For example, food delivery apps withhold delivery addresses from delivery workers, ensuring they accept rides even if they are not economically sound decisions for them (Veen et al, 2020). Therefore, platform capitalists are private regulators of large markets who will regulate economic activity to their interests. The interest differences with agrarian capital in northwest India detailed in this research are thus directly threatened by the insertion of agricultural activity into Agri Stack’s platforms.

## **4.2 Fractions of capital**

This research design has so far explained a motivation to understand how two capitalist groups come in contact and, finding contradictions in their interests, they engage in struggle. To analyze this struggle, the conceptual framework of fractions of capital then becomes ideal. This research paper draws on the extensive conceptualizations of fractions of capital, leveraging the work of

Nicos Poulantzas, Karl Marx and other Marxist scholars, and focuses on the conceptualization work of transnational fractions of capital by the Neo-Gramscian Amsterdam School.

A fraction of capital can be defined as “a relatively cohesive group within a class having a distinct location in the process of social reproduction and concrete sociopolitical interests which may be at odds with other strata” (Mezzadri, 2021, p. 49). Three divisions can define a fraction of capital: a scalar division (i.e., the scale of production, capital intensity, scale of returns), a spatial division (i.e., geographical location, sector, link in a value chain), and social origin (i.e., political background, history) (Mezzadri, 2021). Poulantzas and Fernbach (1978) explain fractions are ‘autonomous social forces’, thus socially cohesive actors with class agency (p. 23).

The investigation of distinct fractions of capital is key in understanding class formation beyond assumptions of class coherence, therefore beyond deterministic understandings of class interest (van Apeldoorn, 2004). Marx’s conceptualization of classes is rather broad, naming the bourgeois, the working class, and landlords as the center of analysis (Marx, 1867, referenced in Mezzadri, 2021). The struggle between these classes illuminates on the tendencies of capitalist society. However, assuming uniform interests in these wide categories does not allow for an investigation of the history and political economy of unique and changing groups in society (Mezzadri, 2021). Thus, investigating the struggles within class allow to explain the development of different political economies and specially shed a light on moments of overtake of power by one group with specific interests, changing capitalist society in their favor. These are what van Apeldoorn (2002) calls the ‘moments of class agency’: crucial moments in which a fraction of capital achieves temporary hegemonic control of the capitalist class, seeing other groups align (or ‘get in formation’) beyond competition, articulating a ‘general capitalist interest’ (p. 26). The struggle between fractions of capital thus is a competition to gain “hegemony within the bourgeoisie, and subsequently over other social groups” (van Apeldoorn, 2004, p. 144).

The achievement of hegemonic control by a fraction of capital involves gaining state backing. In this sense, van Apeldoorn (2004) explains, “[r]ather than taking states as actors, we view them as structures that are reproduced or

transformed by (transnational) social forces” (p. 164). Poulantzas and Fernbach (1978) further argue against an understanding of the state as an ‘entity’ and rather propose defining it as “the condensation of a class relation” (p. 26). These conceptualizations allow for an investigation of the role of state protection and backing in the case of Agri Stack. While platform and agrarian capital dispute hegemonic control, these guarantees by the state are key elements to lose or gain.

However, the importance of the state in this framework does not limit fractions of class to national boundaries. Van Apeldoorn (2002) argues class formation is developed ‘transnationally’, as increasingly groups such as transnational corporations (TNCs) executives share common experiences and interests. This process is, by definition, not ‘outside’ states but rather simultaneously within multiple states (van Apeldoorn, 2004). Thus, different fractions are intrinsically connected beyond states. This is crucial when investigating moments of class agency in a state in which state backing is being disputed and political decisions are being made by government officials: if the interests of a fraction are backed in a state, the fraction’s interests in other locations are backed as well, even if they were not directly represented in the struggle (van Apeldoorn, 2002).

Different fractions can further be defined by their interest in internationalization or state protections. Van Apeldoorn (2002) explains that those fractions whose activities have more liquid and depend less on fixed assets are often defenders of ‘deregulation’ and globalizing trends, while those that inherently require more fixed assets (i.e., productive sectors) are often against these. Van Apeldoorn (2002) explains, “to the degree that these ‘spatial’ ties are concentrated within one state, industrial capital also becomes more dependent upon that state, even to the extent that it needs the state to protect it against foreign competition or to subsidize its investments through industrial policy, etc.” (p. 29). When investigating large scale commercial farmers in northwest India, this tendency can be appreciated, as this fraction dependent on land and machinery strives for state protections. On the other hand, platform capital, characteristically based on digital assets, struggles for an open license to operate and the entrance of TNCs into the region.

While seeing these general tendencies of some fractions of capital may be illuminating, the framework necessarily requires close historical investigation

of the specific context as it directly serves to explain the diversity within class (Mezzadri, 2021). This research thus delves into a historical investigation of two fractions of the capitalist class in India. Large scale commercial farmers in the northwest are defined scalarly by having large operations evident by the historical land accumulation that allowed for nearly 14% of nearly 14% of rural households to own over 70% of all Indian land in the 1980s (NSS Survey, in Omvedt, 1981). This fraction is further characterized by capital intensity due to large investment and having smaller returns than urban elites due to the economic conditions of agricultural production in the country (Omvedt, 1981; Dasgupta, 1979). Spatially, this fraction is located in northwest India, and its core economic activity has been agriculture historically, while diversification into adjacent links of the value chain is popular (Sinha, 2020). Socially, this group has had cohesive political history as initial supporters of the new state, became then a powerful voting group, and engaged in political activity historically with aggrupations such as the BKU (Omvedt, 1981; Brass, 1995).

Platform capital is a fraction scalarly defined by having an unprecedented return on investment and an equally starkly low level of labor intensity. When WhatsApp was sold for 19 billion USD in 2014, it had only 55 workers, making them new millionaires as they received up to 160 million USD each (Business Insider, 2014). Instagram similarly had 13 workers when it was sold for one billion USD (Srnicsek, 2017). A less extreme example of the fraction, Google reached 54,000 workers in 2012 (Davis, 2015, p. 7). Comparatively, the most highly priced companies of the past had many more workers. General Motors had 760,000 workers in 1972, while AT&T had 822,000 in 1982 (Davis, 2015, p. 7). The fraction is spatially defined by its geographic universality, constantly expanding its user base into more remote geographies, and uniquely holding a strong transnational position with complex ties between local and global actors. The platform capitalist fraction further has companies from India, and generally, the global South and expanding into both North and South, as global north companies do as well (Srnicsek, 2017; Athique and Parthasarathi, 2020). In the social aspect, the emergence of this group has only happened in the last two decades and its history is only beginning to be made and studied (Srnicsek, 2017).

This research thus portrays two uniquely defined fractions of the capitalist class. Through this observation, this framework will allow to illuminate the

case of Agri Stack beyond reductive explanations of global North versus South or farmers versus corporations. As van Apeldoorn (2002) has stated, “the analysis of concrete struggles between capital and labour, but also between different fractions of the capitalist class, is indispensable to an understanding of the relationship between production and power” (p. 19).

## **5. The political economy of large-scale commercial farming in northwest India**

This chapter delves into the history and development of large-scale commercial farming in northwest India. It explains the unique context that allowed for the launch of Agri Stack and that defines its responses. This work presents the formation of a fraction of capital that over-time became the most productive in rural India through investment, credit, and technology expansion. This chapter details the fraction’s reliance on the mandi system and several other protections for its development. It demonstrates that when these state protections are attacked, consequences are critical to rural subsistence and urban development. The chapter further presents a state that has led waves of liberalization as it faced both domestic and international pressures. Despite state-led pushes for liberalization, for most of its history the state protected the mandi system and other basic forms of support of farmers. This was true until recent years when this support was put into question. It is in this context that Agri Stack emerges. The chapter further examines the way in which a fraction of capital became threatened by agricultural technology driven environmental degradation. Lastly, the chapter demonstrates this fraction has developed as a strong political force that has fought back against threats to their power (such as land reforms and decrease of state procurement) and against wide liberalizing measures.

Despite its long history of development and the large population density of India, the agricultural sector has been an arena of conflict and instability. In the 40 years starting in 1850, 24 famines with tens of millions of casualties took place. These crises revealed precarity and structural poverty that were enforced by caste, class, ethnicity, and other such forms of marginalization (Tricontinental, 2021). The colonial period started with the English East India Company which took control of India in 1757 and embarked on a quest to reorganize

economic relations, in a way that made them fit for extraction (Tricontinental, 2021). The regime extracted taxes at such extent that even on good years farmers were unable to save. This left them vulnerable to the very common external shocks to production (Tricontinental, 2021). According to the economist Utsa Patnaik, between 1765 and 1938 the colonial rule extracted the equivalent of 45 trillion USD in today's terms (Patnaik, 2018). The result of this plunder was, among others, chronic famines.

In 1947, at the time of independence, agriculture was the predominant economic activity in India. It employed the majority of the workforce. The sector was characterized by high labor intensity, low productivity, and lack of investment (Sasmal, 2014). The new ruling class' agenda was focused on public-sector led industrialization while agriculture remained a traditional and unproductive sector. However, this soon became a problem to industrialists as they needed agricultural inputs and to feed an expanding workforce (Tricontinental, 2021). Shortly after, the GoI embarked on a task to raise food production and food security in the 1950s, creating several protectionist measures to the agricultural sector (Walters, 2021).

A large problem for farmers was the power of traders and lenders to set low prices as conditions for credit. Farmers were forced to sell in the lenders and traders' terms. This caused indebtedness, a reproductive squeeze that drove farmers to poverty, including documented cases of farmer suicides linked to debt (Harris-White, 2008). To end this, the state of Punjab passed the Punjab Agricultural Produce Markets Committee (APMC) Act in 1939 (Walters, 2021). While initially unsuccessful, the Act took off with independence setting up the mandi system: a network of state marketing boards that set up physical markets where all agricultural products must be sold at a price set up by the Committees, avoiding previous exploitative conditions (Walters, 2021).

In the mid 1960s, India's food security was undermined. An intense drought reduced food production by 20 percent (Tricontinental, 2021). In 1966, Prime Minister Indira Gandhi negotiated a rise in grain imports with the US government and the World Bank, agreeing in return to crucial liberalizing measures that would dismantle the import substitution model the country had



been investing in since the 1950s, lax trade restrictions, and significantly a devaluation of the Indian-Rupee. However, grain imports continued to drop after the agreement and inflation in India rose, making the country fall deeper into crisis (Tricontinental, 2021; Gill, 2021). Despite the liberalizing macroeconomic measures, during the 1950s and 1960s most states passed Agricultural Produce Marketing Regulation (APMR) Acts and APMCs were established across India by the 1970s (Walters, 2021). This generated large criticism and liberalizing pressures from the US and the World Bank (Gill, 2021). This episode showcases the strong two-way relation between food (in)security and economic liberalization, as both can trigger the other.

Another key issue in rural India was land distribution. The colonial plunder led to the disintegration of traditional land tenure, seeing the emergence of new systems (Dasgupta, 1977). In northwest India, land ownership was held by Brahmin elites while intermediate farmer castes dominated production through leasing (Dasgupta, 1977, p. 34-35). Shortly after independence, the state enforced the Land Reform of 1951. Land concentration declined with farms of over 50 acres concentrating 12% of land in 1961, compared to the 17% in 1954. While this was an achievement of the reform, land distribution remained a problem (Government of India, in Dasgupta, 1977). The most notorious achievement was the buy-out of landlords. These left the rural sphere and became urban elites while working farmers from the Shudra castes became the new proprietors (Omvedt, 1981). This was the beginning of the class of farm owners which this research investigates: a consolidated middle-caste group which had supported the new state at the time of independence and were the key beneficiaries of the first round of reforms (Dasgupta, 1977). They would later remain a strong political group, protesting the 2020 Farm Laws and Agri Stack, as the origins of the BKU can be traced to this group (Brass, 1995).

In Punjab and Haryana, the new dominant class expanded their operations. Commodity crops expanded, production turned to the market, and competitiveness and profitability increased (Omvedt, 1981). While productivity was elevated to a certain extent, investment remained extremely low (Patel, 2013; Omvedt, 1981). In this scenario, the Green Revolution (GR) reached India and stalled the unsuccessful debates of a second reform for land distribution (Patel, 2013). Instead, the GR relied on dominant castes of land owners to solve the

food crisis (Dasgupta, 1977). During 1960s and 1970s, the GR years, the banks were nationalized and investment in agriculture increased with national funds of the state and international funds from the World Bank (Omvedt, 1981). During this period, the government more than doubled investment in infrastructure that made production more profitable (i.e., roads and dams) while farmers were encouraged to invest in means of production (i.e., irrigation systems, tractors, etc.) (Omvedt, 1981, p. 144).

Seeds were a key innovation with 'high-yielding' varieties from CGIAR (formerly the Consultative Group on International Agricultural Research) research centers around the world. First, wheat and rice seeds became the two central crops of the GR in India, especially grown in Punjab, Haryana, and Western Uttar Pradesh (the northwest), the 'GR belt' (Prabhakaran Nair, 2021). During the GR period India became a net food export country (Dasgupta, 1977).

However, GR technologies were imported en masse, as *The Economic Times* described, "instead of importing food we are importing fertilizers for producing food" (*The Economic Times*, 1980, in Omvedt, 1981, p. 144). This would anchor the new form of production in foreign exchange reserves. Indeed, these crops were highly responsive to fertilizers and at the time India did not have the industrial fertilizer production facilities they required (Prabhakaran Nair, 2021). The new seeds were more vulnerable to pests, so pesticide imports and use increased seven-fold during this period (Subramanian et al. 1973, in Patel, 2013, p. 29).

The high use of fertilizers, pesticides, water, and other inputs came at the cost of environmental degradation. Ground water reservoirs were overwhelmingly consumed with free electricity. This has made irrigation challenging or non-viable in areas of the GR belt today (Sasmal, 2014). Prabhakaran Nair (2021) explains that due to the high use of chemical inputs and monocropping of wheat and rice, soil fertility was depleted over 120 million hectares, about a third of the 'GR belt'. Additionally, health was deeply affected by the environmental crisis, with high increase of cancer, mental retardation, and reproductive disorders in these areas, making the Malwa region in Punjab notoriously known

as the ‘cancer capital’ of India (Nanda et al., 2016). This disproportionately affected women and children, who carried tasks involving contact with water (i.e., fetching, cooking), suffering constant chemical exposure (Patel, 2013, p. 28).

GR crops were not simply welcomed in India. To secure their adoption, the government created the Minimum Support Price (MSP) in 1966-67, raising the price of GR wheat varieties and then of GR rice. Over time, MSP has expanded to 21 other agricultural commodities (Prabhakaran Nair, 2021). To distribute the benefits of the GR throughout the country, the GoI extended state procurement through the Food Corporation of India, allowing grain deficit states to access grain from the surplus-producing GR states at affordable prices (Prabhakaran Nair, 2021).

The MSP became a crucial element of the mandi system, joining APMC markets and state procurement. This combination allowed farmers in northwest India to sell their produce at profitable prices, securing their incomes (Lerche, 2011). Sinha (2020) stated that “Punjab's agricultural success is attributable in no small part to state-led procurement of wheat and paddy from its regulated markets” (p. 261). However, the MSP relied on trust in administrative offices, and it could be collapsed at any time at the local level (Basu, 2021). This price is decided twice a year by state administration and if pushed under market price, it essentially disappears, as produce is then sold at market prices (Basu, 2021). Prabhakaran Nair (2021) argues that this is the reality most MSP crops. Thus, MSP has been a tool malleable to the will of the state.

Another aspect of the GR has been the rise of economic inequality (Omvedt, 1981). Capital investment in large-scale commercial farms, especially in irrigation systems, increased the price of land while small farms remained inexpensive and thus available for significant takeovers (Omvedt, 1981). This was a large limitation for the distribution of benefits of the GR and the promoted goal of benefiting the poor. By the 1980s, in Punjab and Haryana accumulation had risen significantly and the previously poor small land-owning and tenant farmers had become large-scale commercial farmers (Dasgupta, 1977). In the early 1980s, commercial farming operations represented nearly 14% of rural families in India and owned between 70 and 80% of all Indian land (NSS Survey, in Omvedt, 1981).

Additionally, limited access to formal credit for small scale operations meant these had to sell to middlemen due to credit ties, making state procurement reserved for large-scale commercial farmers, while small-scale farmer fractions were driven to impoverishment (Lerche, 2011). Another sign of the rise in rural inequality is the rise in tenancy between the mid 1970s and the early 2000s, which grew from 22 to 67% of operational land holdings (Lerche, 2022, p. 112). Simultaneously, terms of tenancy spiked costs and risks for tenants (Lerche, 2022).

Omvedt (1981) describes large-scale commercial farmers as having limited success in comparison with the industrial bourgeoisie, engaging in farm labour (mostly supervision in the field) and vulnerable to shocks: “given the often violently fluctuating price and market conditions of any capitalist agriculture and the vagaries of weather on top of the normally insecure life of all small capitalists anywhere in the world, their life is likely insecure and unstable” (p. 152). The most successful farmers diversified parts of their incomes into adjacent sections of the value chain becoming lenders, traders, food stores owners, and others (Omvedt, 1981, p. 149; Sinha, 2020).

Yet, the weakness of the import model of the GR would only be fully exposed in the 1990, as India hit a foreign exchange crisis, unable to pay for its imports. As many global South countries had done before, India turned to the International Monetary Fund (IMF) for a bailout in exchange for neoliberal structural adjustment (Tricontinental, 2021). This would mark the GoI’s relationship with agriculture for the next decades, as several protections and subsidies disappeared (Lerche, 2011). Moreover, the IMF was not the only entity interested in pushing neoliberalization into Indian agriculture. The World Trade Organization and the World Bank became heavy critics of India’s ‘market-distorting’ mandi system (Tricontinental, 2021; Gill, 2021). As a result, the banking sector was liberalized. Several rural bank branches closed, and agricultural credit interests rose, pushing more farmers back to exploitative informal credit (Tricontinental, 2021). Input subsidies were also rolled back and investment in rural public infrastructure decreased sharply (Reddy and Sharma, 2010, in Gill, 2021). Nonetheless, the GoI protected certain measures, including the MSP and AP-MCs throughout this period (Gill, 2021).

The neoliberal development was characterized in rural India by politically driven impoverishment, with income and food insecurity, leading to a return of high numbers of farmer suicides in the 1990s and 2000s (Lerche, 2011; Patnaik, 2013, in Gill, 2021). Lerche (2011) describes a sector formed in a ‘shielded home market’ and pushed into the global market. This happened at a time when of falling prices and sharp fluctuation (Lerche, 2011, p. 106). The state of environmental degradation accelerated this crisis (Lerche, 2011). The impact on food security was profound. The number of undernourished people in the country increased by 20 million between 1995-2001 (Tricontinental, 2021). This was the background for the rise of BJP to power in 1999. Indeed, this rise to power deepened the neoliberal agrarian reforms and thus the agrarian crisis (Gill, 2021).

By 2004, the opposition to the neoliberal regime, with a significant contribution from the agrarian sector, had consolidated, and the BJP was not reelected (Gill, 2021). The United Progressive Alliance (UPA) won the parliamentary elections backed by Left-wing parties, setting an agenda that promised to ensure the well-being of farmers (Tricontinental, 2021). The first period of the UPA was a turn away from neoliberalism in rural India: agricultural credit improved, investment in rural infrastructure raised, and Acts protecting farmers were announced (i.e., the Food Security Act and the Land Acquisition Act) (Tricontinental, 2021; Gill, 2021). However, the UPA’s second period slowly turned back towards liberalization policies and land, input, and future trading markets were deregulated (Tricontinental, 2021).

For the business elite, the state of farming in India had large opportunities to raise profitability through liberalization. One report by Boston Consulting Group (2012) states that “the Essential Commodities Act should [...] be scrapped to allow free interstate movement of commodities.” (p. 121). It is important to note that the rationale behind this Act was avoiding competition for cheap labor across the country, securing access to food in states with low incomes and low market food prices, and distributing the benefits of the GR (Basu, 2021). A McKinsey & Company report (2013) further recommends delisting perishables from APMC and analyzing the possibility of abolishing the APCM Act altogether. It further recommends promoting aggregation of land, amending the Land Ceiling Act (p. 22). A recent Bain & Company report (2021)

has recommended eliminating the intermediaries characteristic of the mandi system as well as the APMC taxes to increase farmer and corporate profit. By 2014, time of the return to power of the BJP, Cargill, the second largest grain trader in India (after the Indian government), claimed that dismantling the APMCs would make Indian grains more competitive on the global market and thus exports would increase, benefiting farmers (Dutt, 2020, in Gill, 2020, p. 11).

The return to liberalization would be further strengthened with the BJP's return to power in 2014, strongly backed by India's largest capitalists, including Mukesh Ambani (chair and managing director of Reliance Industries), who publicly endorsed and praised BJP's Narendra Modi (Tricontinental, 2021). The new government was elected with promises of decreasing the power of farmer unions but confronted a new threat of food insecurity as the US faced a new crisis of grain overproduction. Thus, during his first term as Prime Minister, Modi did not directly threaten the MSP and mandi system despite global pressures from the WTO and the US (Gill, 2021). This would change in Modi's second term, in which the COVID-19 pandemic provided a new level of discretion and postponed consultations.

On June 5<sup>th</sup>, 2020, the GoI announced three laws liberalizing agriculture and threatening the mandi system. These laws would cause large debate and backlash until their repeal in November of 2021 (Narayanan, 2020; Biswas, 2021). The first law, the Farmers Produce Trade and Commerce (Promotion and Facilitation) bill, relaxes restrictions on sales and procurement of agricultural commodities (essentially taking power away from APMCs); the second law, the Essential Commodities Act, relaxes restrictions on hoarding and thus opens new avenues for financial speculation; and thirdly, the Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Act, reregulates contract farming allowing for verbal agreements giving more power to hiring parties, and allows for inter-state hiring among others (for further detail refer to Narayanan, 2020).

The announcement of the Three Farm Laws and their passing in September 2020, did not follow open discussions with farmers and state administrations. Thus, it faced severe backlash in the form of farmer protests which started in November of 2020 and lasted almost a year. The protests focused in Punjab,

Haryana, and Uttar Pradesh included hundreds of thousands of mobilized farmers. They blocked entry roads to New Delhi, engaged in hunger strikes, and raised solidarity with protesters in over 50 cities around the world (Reuters, 2021). The protests took place in extreme weather conditions and the COVID-19 pandemic, and faced police brutality which led to 700 casualties. Prime Minister Modi announced the repeal of the Laws on November 19th of 2021, days before the protests' one year anniversary (Reuters, 2021).

In the midst of the farmer struggle against liberalization, in April 2021, the government announced Agri Stack, with the promise of digitalizing agriculture and bringing farmers new accessible technologies (Shagun, 2021; Paliath, 2022). Weeks later the government published a letter on InDEA, the digital architecture that would support AgriStack and started publishing the Memorandums of Understanding signed. Farmers in Punjab and Haryana qualified the Stack as another attempt at liberalizing agriculture in favor of corporate actors (Paliath, 2022; Srivastava, 2021). This is the context of the farmers' reaction to the introduction of platform capital in northwest India.

## **6. The platform economy in context**

Agri Stack is the agricultural wing of an economy-wide turn to digitalization characterized by the power of Digital India (Thomas, 2019). Parthasarathi and Athique (2020) argue that this 'era' crucially differs from previous waves of liberalization and privatization, as in this one the state takes the role of "orchestrator and an instrument in shaping market norms, while also being a seller of bandwidth and a procurer of infrastructural development" (Parthasarathi and Athique, 2020, p. 2). The turn, rather than continuing with the slogan of 'deregulation' in the name of efficiencies, clearly regulates in favor of selected government sponsored capitalists, such as the Ambanis, as Reliance Industries takes a key position in Agri Stack (Parthasarathi and Athique, 2020). Still, the turn towards privatization remains an underlying feature, as the GoI launches initiatives with the promise of 'doubling farmers' incomes' and raising agricultural productivity but all relying on private sector provision (Paliath, 2022).

India is one of the fastest digitalizing countries in the world (McKinsey, 2019). This is a growing phenomenon pushed by large investment from the private and public sector. The launch of Digital India in 2015 has been a significant impulse from the Government of India (GoI) (Athique and Parthasarathi, 2020). This investment came after the peak of GDP contribution of the information technology (IT) business process sourcing sectors of 5.1% in 2014-15, which then returned to a steady contribution of nearly 4% with the rise of US protectionist measures for their IT industry (Thomas, 2019, p. 3). However, as Srnicek (2017) explains, the relevance of the platform economy must be understood not only by its direct share of the economy but by its presence and outstanding expansion into every sector.

Platformization of retail, communications, and banking in India has been an important phenomenon of these industries in recent years (Athique and Parthasarathi, 2020; McKinsey, 2020). However, a further important phenomenon has been the platformization of the informal economy, which historically employed 85% of the workforce (Athique and Parthasarathi, 2020, p.14). Platforms have rapidly reached large segments of 'low skill' service labour including drivers, cooks, security guards, household servants, hair and make-up stylists, gardeners, etc. (Athique and Parthasarathi, 2020). This type of work arrangements through which companies and individuals hire casual labour in platforms is known as gig work, or the gig economy.

Deepika and Madhusoodhan (2022) state that the gig economy currently employs nearly 15 million Indians, of which up to 30% could perform 'specialized' work including lawyers, designers, and nurses. The Boston Consulting Group (2021) estimates that the platform economy is rapidly growing and could absorb up to 90 million workers in India in the long term. This rise is not applauded by everyone, as several studies have shown the precarization of labour endured by gig workers, with lack of employer accountability and labour regulation (Langley and Leyshon, 2017; Thelen, 2018; Deepika and Madhusoodhan, 2022). This has led to a recent debate on labour law reforms on India to include this 'non-organized' section of the working class into labour regulations (Deepika and Madhusoodhan, 2022).



While the push of public investment grows and state regulation debates arise, private investment is not behind. In the last 10 years, India has produced over 100 startups that surpass the 1 billion USD valuation mark, also known as ‘unicorns’ (Upadhyay and Pathak, 2022). These digital Indian enterprises have received global attention, having several rounds of funding by Asian venture capital funds such as Ali Baba, Softbank and MediaTek, and US companies, such as Amazon, Walmart, and Microsoft, promptly joining the competition (Athique and Parthasarathi, 2020). In 2020, Google further announced a 10 billion USD investment in Digital India for the next 5 to 7 years (Inamdar, 2020).

While the Indian economy has seen a sharp process of platformization, agriculture remains one of the least digitalized sectors (Bain and Company, 2021). As of 2022, India has not been home to any agritech unicorns, lacking behind China and Vietnam in Asia (Upadhyay and Pathak, 2022; Failory, 2022). The sector is still considered traditional and backwards, especially in the areas outside of the Green Revolution belt (Das Gupta, 2020). Nonetheless, this is rapidly changing, as investment in agritech is swiftly rising. In the 18 months since January 2021, the Indian agritech sector received nearly 1.17 billion USD in investment, far from the annual average of about 250 million USD between 2017 and 2020 (Upadhyay and Pathak, 2022). Investors include large US funds (such as Walmart and Tiger Global) as well as Indian and other Asian capital (such as Flipkart) (Upadhyay and Pathak, 2022). This expansion in investment is projected to keep growing. In 2022, several agritech Venture Capital (VC) firms have announced new waves of investments including 130 million USD by Omnivore, 125 million USD by Ankur Capital, and 25 million USD by Ninjacart (Upadhyay and Pathak, 2022). Bain and Company (2021) projects that the agritech market in India will grow up to 35 billion USD by 2025 (p. 3).

This change can be explained by two forms of pressure on the digitalization of agriculture that this research discerns as old and new forms. The old forms of pressure refer to those coming from the financial markets of agricultural commodities. Gill (2021) calls this “an emergent agritech mode of accumulation” (p. 4). It consists of financial speculation of agricultural commodities in the derivative agricultural economy, backed by large amounts of data collected in digital agriculture services. Financial speculation of agricultural commodities is not a new activity, however. The activity gained economic importance after

the United States Civil war of the 1860s due to the economic uncertainty the War provoked. Since then, speculative financial markets of agricultural commodities increased sharply. The result was persistent price increases and volatility, protested in the late 19th century (Cowing, 1965).

Gill (2021) thus refers to an improvement in the business model of speculation: a great effort in harvesting data to be more competitive in the financial market. With significantly larger amounts of more precise data compared to competitors, companies are able to move first to buy low and sell high. Cargill, India's second largest grain trader only after the Food Corporation of India, has been working on this competitive advantage since the 1980s, with the creation of Cargill Platform, a network of subsidiaries and contractors through which the company has successfully collected large amounts of data (not to be confused with digital platform businesses in which this research focuses) (Salerno, 2017; Gill, 2021). Gill explains, "the Platform's capacity to access data from across the world left Cargill strongly positioned to anticipate, and possibly manipulate, commodity price swings and thus be able to determine with greater surety when to sell short or hold long in the derivatives market" (Gill, 2021, p. 11). This is a direct way in which data harvesting affects the farmers from which the data is collected.

Companies have been effectively competing in agricultural commodity trading backed by data for decades (Gill, 2021). Yet, this form of pressure has gained momentum recently due to the economic crisis originated with the COVID 19 pandemic followed by the instability unleashed by the Ukraine-Russia war started in 2022. Several studies have shown that in times of crisis and instability, financial speculation of agricultural commodities increases, as they are perceived as secure investments (i.e., Cowing, 1965; McMichael, 2009; Tokar and Magdoff, 2009). Further, Hendrikse et al. (2022) explain that shares in Big Tech companies have become a safe alternative for investors in times crisis as well, in reaction to the overpricing of government bonds (the first route towards securing investments) and other pressures on asset yields, as seen in the 2008 crisis. This same phenomenon of large investment in Big Tech shares is growing after the 2020 pandemic (Hendrikse et al., 2022), accompanied by the investment

in derivative agricultural economy. Thus, digitalization of agriculture, as an opportunity to compete in these markets, becomes extremely well financed and an increasingly relevant arena of competition for global firms.

The new forms of pressure on the digitalization of agriculture comes from the grocery retail sector. Traditionally, this has not been considered a competitive sector in India, as its expansion through the country to areas with traditional market setups has been slow. Indian businesses have only concentrated about 1% of global grocery investment historically (McKinsey & Company, 2022, p. 22). However, in 2020, investment spiked into the ‘untapped market’ with a 7 billion USD investment, 70% of the global share (McKinsey & Company, 2022). While the largest share of the investment went to Reliance Industries (which created a VC fund and two platform-based businesses that year), global private equity companies and venture capital funds have looked at diverse businesses in the food industry (McKinsey & Company, 2022; Shagun, 2021). Competition has thus become aggressive.

The stark competition between Amazon, Reliance and Walmart has led to decisions in courts, dramatic takeovers, and loan rejections as their acquisitions of smaller competitors sped up (see for example Faithful, 2021 and Mathew, 2022). In the last two years, Reliance has acquired over 12 companies for 4.2 billion USD, while Amazon acquired and expanded More Retail, and Flipkart, majority-owned by Walmart, became Ninjacart’s largest investor (McKinsey, 2022; The Economic Times, 2021). The several acquisitions beyond the three firms, are signs of an increasingly competitive market in which actors are willing to invest big, fast, and innovatively.

In this scenario, business experts have offered formulas to compete. Reports point at two major strategies (Boston Consulting Group, 2012; Bain & Company, 2021; McKinsey & Company, 2019). The first, is to lower costs by cutting intermediaries. The mandi system is comprised of trade intermediaries and costs related to them: the *arthias* charge commissions of 10 to 14% of the production cost, traders take a margin of 4 to 5%, the APMC markets have taxes and fees of about 2%, bagging and weighing at the markets costs another three to 4%, and tonnage losses in the market can add a loss of up to 4% (Bain & Company, 2021, p. 5). Thus, business reports see opportunities in skipping these

intermediaries and buying directly from farmers (Boston Consulting Group, 2012; Bain & Company, 2021; McKinsey & Company, 2019).

However, agricultural products trading is regulated in India (as discussed in Chapter 5) to protect farmers from exploitative trading conditions and farmers must go through the mandi system (Tricontinental, 2021). The now repealed Farm Laws of 2021 aimed at changing this by allowing for direct purchase by corporates to farmers (Bain & Company, 2021). Still, farmers may sell outside of the mandi system with a permit, but they may not access the Minimum Support Price if they do so, facing the instability of market prices. Further, while the existence of intermediaries in the mandi system has been questioned, these provide services to farmers that have made their position stable (Sinha, 2020). Such is the position of the *arbtias*, intermediaries that provide credit and trading services. Their closeness to large-scale commercial farmers in northwest India is additionally due to the diversification of these farmers into *arbtias* themselves, holding both positions. Thus, there are no contemporary strong mobilizations against *arbtias*. Instead, these tend to protest side-by-side with farmers in struggles against agricultural liberalization (Sinha, 2020).

Consulting firms claim another way of competing is through digital channels (McKinsey & Company, 2022; Bain & company, 2021). According to these reports, digital channels cut wastage costs related to customer handling and labour costs through automation. Further, it attracts customers by providing a complete, omnichannel experience (McKinsey & Company, 2022; Bain & company, 2021). McKinsey & Company (2022) states this is now “a prerequisite to growth” in India (p. 25). The consulting firm further states that the revenue generated from online businesses has nearly doubled since 2019 for the leading companies in the sector (McKinsey & Company, 2022). Bain & Company (2021) has published brief guidelines to create an agritech platform. This instructs companies to first consolidate a large farmer base providing digital agriculture services (a digital marketplace, precision agriculture tools, etc.), a ‘hook’ for farmers; then, add more profitable services such as contract farming (bringing the gig economy to agriculture), financial services, and connection to additional services like transport and warehousing (Bain & Company, 2021, p. 6). It is thus no surprise that large companies have already embarked on this route.

Reliance Industries launched Jio Platforms, in 2020. The new subsidiary, which effectively works as a VC fund, rapidly got the attention of Big Tech. In less than three months from its launch, it raised 20.2 billion USD for 33% of the company (Bahree, 2020). Facebook became the biggest investor with a 9.9% acquisition for 5.7 billion USD and Google has further taken a 7.7% share for 4.7 billion USD. These investments were made at a lower valuation than the rest as these are not considered financial investors but ‘strategic tech investors’, which will further bring their technologies to the new company, an advantage Big Tech holds (Dash, 2020). Soon after Facebook’s acquisition, the new investor got government approval to deploy WhatsApp payment in India after multiple denied applications (Gill, 2021). The fund has since launched two platform-based businesses: JioMart and JioKrishi. The interconnected apps are expected to provide precision agriculture tools and advisory to farmers and an online supermarket, expected to turn into a farm-to-fork marketplace for consumers to buy fresh products ‘directly’ from farmers (Das Gupta, 2020).

Since the announcement of the comprehensive platform business model, tensions arose among farmers in Punjab and Haryana, who pointed at the monopolizing tendencies of Reliance in the region. The company’s incorporation into the telecommunications market was aggressive. By using predatory pricing, they were able to attract large numbers of users, driving the broad and differentiated competition out of the market. Within two years of entering the market, the company lowered the quality of the service and pushed up prices (Rao, 2021). Farmers accused Reliance of having similar intentions with JioKrishi. The expectation, they claimed, is that the company will offer free services, gather information about the land to buy them out of it, and turn the region into precarized, corporate-owned, contract farming (Rao, 2021; Paliwal, 2020). The company has denied these plans and there is no evidence of agricultural land being bought by Reliance (Srivastava, 2021). Still, tensions with farmers kept rising leading to the destruction of over 1,500 reliance towers and over 2 million user drop outs from Reliance Jio’s phone operator services in Punjab and Haryana in December of 2020 (Scroll, 2022; Paliwal, 2020).

This did not prevent Jio Platforms to join Agri Stack, as the GoI made public in June of 2021 when they published the MoU signed with the company (Ministry of Agriculture & Farmers Welfare & Jio, 2021). The MoU attributed

Jio Platforms several roles in the new initiative including the installation of IoT sensors in farms, on-boarding farmers into the platform and introducing them to its features, creating an advisory service connecting farmers to scientists, and others (Ministry of Agriculture & Farmers Welfare & Jio, 2021). This suggests that through Agri Stack, Reliance acquires access to large amounts of historical data and support for harvesting more, significantly advancing the company's platform businesses. Reliance may be the largest business conglomerate in India, but it is certainly not the only company going into agritech platformization and benefiting from AgriStack. Amazon's entrance after rounds of expansion of Amazon Fresh, Ninjacart's entrance accompanied with large investments in agritech startups, and Star Agribazaar's entrance after its well-funded platform launch, are all signs that the race for the platform success is going through AgriStack (Ministry of Agriculture & Farmers Welfare & Ninjacart, 2021; Ministry of Agriculture & Farmers Welfare & Amazon, 2021; Ministry of Agriculture & Farmers Welfare & Agribazaar, 2021; Upadhyay and Pathak, 2022).

The new form of pressure thus comes from a need of retail to expand into new ways to compete, cutting costs where it has not been successful before: outside of the protection of the mandi. As developed in chapter 4, successful platform capitalists cross subsidize services and build strong exit barriers for users and providers (Langley and Leyshon, 2017). Several Agri Stack partners developing the platform are also agricultural procurers, they compete in grocery retail markets. By concentrating key buyers, loans and other financial services, information and advisory, and other crucial resources, platform partners gain new position of power in agricultural procurement. This has already emerged in initial interviews with farmers in Agri Stack pilots (Saha, 2021). This is no new position but one similar to the one enjoyed by lenders (who controlled scarce financial services) and traders (who controlled key buyers) at the time of Indian Independence, previous to the reforms of the 60s and 70s that built regulated markets and set minimum support prices in response (Tricontinental, 2021). Yet, the difference is platform capital will be able to do this without dismantling or even challenging these protections which become simply unused.

The old form of pressure, data-backed financial speculation with agricultural commodities, with its urgent intensity in face of recent economic crises, further bypasses regulations protecting the public from the price raises and the

instability unleashed by financial speculation. A successful platform harvests immense amounts of data, creating competitive advantages for well-funded investors to turn to these producers for commodities to trade in the global markets (Gill, 2021). These actors are thus in the position to disrupt prices through hoarding commodities (which often does not require regulated physical warehouses as purchases are digital) and use information asymmetries to secure the lowest prices from the advantageous position large funding involves (i.e., ability to hold off purchases and sales, purchase large quantities, etc.) (Gill, 2021). Therefore, while the Essential Commodities Act (threatened by the 2020 Farm Laws) may remain intact, the safeguards it provided may not.

## 7. Discussion and insights

This research has examined the history and current state of large-scale commercial farming in northwest India. Chapter 5 has painted a picture of a fraction of the capitalist class that has been able to develop through the years with support from the GoI: public investment in infrastructure and access to credit to invest; entrance of technologies that augmented productivity and allowed for new rounds of accumulation; a privileged position in the face of land ownership arrangements determined by the state; a position as key recipients of the benefits of the mandi system (i.e., MSP for the region's key crops, strong procurement by the Food Corporation of India for large-scale operations). While farmers have faced waves of liberalization of agriculture and other challenges (i.e., droughts and degradation of natural resources), the state has protected key measures described above until recent times. All in all, evidence points that this fraction has been able to prosper because of the protections and benefits the state has provided.

While other links of the value chain have developed with private investment, the agricultural production link has not seen this influx of private capital. Agriculture is not seen as a very profitable sector (Upadhyay and Pathak, 2022; McKinsey & Company, 2019). Scholars have argued that agricultural production is not profitable in a liberalized economy. It is rather made a profitable activity by the state as it is key to urban economic development (Lerche and Harris-White, 2013; Bernstein, 2013; Mann and Dickson, 1978). The Indian case

demonstrates the challenges to capitalist development which a weak agrarian sector provides. Weak food systems translate into lack of inputs for industrial production, expensive urban labor (due to high cost of living based on high food prices), the need for expensive food imports, and therefore consumption of foreign exchange reserves, among others (see chapters 5; Tricontinental, 2021). It follows that when agriculture deteriorates economic development is challenged. Thus, intervention in agriculture becomes a key task of the state. This is not unique to India. Subsidies and budgetary allocation for the agricultural has been a prominent characteristic of many states. For example, the United States' agricultural sector has received around 46 billion USD in 2020, equivalent to 40% of all farm income in the country (Mahapatra, 2020).

Yet, state intervention is being disputed in rural India, as two fractions of capital encounter in a struggle for state sponsorship. Platform capital, much like financial capital, has no fundamental spatial ties. It has little or no physical presence in large areas where it operates and generates profits (Srnicek, 2017). These businesses are difficult to tax because taxing is generally done based on accounting of capital and operational expenditure and revenues reception. Platform capitalists tend to put IT machinery and high-earning employees in technology industry areas appealing to their employees, such as Silicon Valley. Their banking further tends to be in tax havens far from their consumer base (Christensen and Hearson, 2019; Srnicek, 2017). Therefore, as van Apeldoorn (2004) has observed in financial capital, this transposition suggests platform capital is less reliant on government support and protections from foreign competition and instead benefits from liberalizing measures.

In the case of Agri Stack, what can be observed is that the GoI has anticipated the expansion of platform capital into the rural sphere and has taken an actively intervening role. As the MoUs signed with its partners, the Stack determines privileged positions, allowing partners to become procurers, developers, gatekeepers, providers, and informants, among other roles. For some MoU signatories, joining the Stack can be understood as a strategy to expand into new markets, secure positions of competition, and collect data (see chapter 2). The state further provides access to existing data sets, defining privileged starting positions in the race for monopoly platform businesses set out to



achieve. The launch of Agri Stack in 2021 has thus shown a sponsorship of platform capitalists by the GoI.

Agrarian capital, on the other hand, has clear spatial ties. Much like industrial capital, it depends on physical assets anchored to a specific geography, namely land, machinery, irrigation systems, etc. Hence, it depends on state protections and support more strongly, as this research has consistently shown. These are threatened as the GoI opens the doors for platform-based businesses, allowing for them to work around protectionist measures, unleashing a wave of liberalization of agriculture. Yet, this is not a simple liberalization process, as the GoI takes on roles of market orchestrator, procurer of technologies, and provider of data and infrastructure in the new economic arrangement. It is not a process of state retrieval but of state transformation, sponsoring and joining the activities of a fraction of capital. Thus, this research shows two fractions of the capitalist class clashing in a struggle for state sponsorship and hegemonic control of government resources.

Agri Stack is part of a longer process of liberalization of agriculture driven by several fractions of capital. The 3 Farm Laws of 2020 put at risk the mandi system and other forms of state intervention in agriculture (Narayanan, 2020). The weakening or disappearance of the mandi system would support the economic interests of retailers, procurers, and financial traders, as these would gain negotiation power, a decrease of costs, a legalization of certain activities, among other benefits (see chapter 5; Narayanan, 2020). The state finally aligned with farmers, repealing the Laws after year-long protests. However, this research has shown that, as Agri Stack is deployed and platform capital expands into rural India, these same state measures become threatened. While there have been relevant responses from farmers, these have not approached the scale seen in the Farm Laws protests. Thelen's (2018) analysis of protests against the expansion of Uber suggests that platform expansion is rarely protested, and when it is it is rarely early enough to stop or shape the expansion. Platform capitalist business portray novel and complex business models, avoiding the attention that direct policy changes have called for.

Indeed, this research project set out with a question regarding the interests of Big Tech in digital agriculture in India. Agri Stack was promoted under

the promise to raise farmers' incomes through the benefits of digitalization of agriculture. Why would Amazon, Microsoft, Google, Facebook, and Cisco among other companies race to a government initiative to improve farmer incomes in India? How large of a profit is there to be generated in digital agriculture? These questions lead to a broader debate of value generation in platform capital. Platform businesses generate profits through rent, but also generate data for businesses of all sorts to become more competitive (Srnicek, 2017). As chapter 6 has explained, players involved in Agri Stack (i.e., Amazon and Reliance) and others pushing for digitalization of agriculture (i.e., Cargill) perform economic activities in the financial derivatives market and grocery retail market. Data can be used as a competitive advantage in these markets (see chapter 6). In this context, does platform capital create value or does it behave like merchant capital, appropriating it? The activation of rent-collecting digital markets is arguably not a value-generating activity. Neither are financial speculation of commodity prices nor cost reductions of agricultural products for retail. Therefore, platform capital may be tentatively argued to be a fraction of capital that redistributes value, rather than generating it. Moreover, it redistributes value away from the countryside and agricultural sector.

It follows a discussion of who is appropriating this value. Different to industrial capital, platform capitalists do not tend to have many workers (Srnicek, 2017; Davis, 2015). To this comparison we can add an observation of the individuals who own and manage platform capital. In 2022, seven out of the ten highest net worth individuals in the world are platform capitalists, including Mukesh Ambani, chairman and managing director of India's Reliance Industries which recently joined the fraction with the creation of Jio Platforms (Forbes, 2022). What these observation show is that platform capitalism represents a form of value redistribution that unleashes a novel magnitude of accumulation.

Can this redistribution of value away from agriculture be stopped in India? Agri Stack is not the first initiative of the GoI to push digitalization of agriculture. The limited escalation of the eNAM is an example of an initiative that did not reach the expectations in terms of impact (Nirmal, 2018). Political changes may pose threats to the Stack if a new government is more aligned with agrarian capital and agricultural interventionism. Agri Stack may be descaled or rolled back. However, as cases in Latin America, Africa, and Asia in chapter 2

have shown, the data access and support provided by the GoI are not indispensable elements for platform capital. As the pilots are deployed every day, Big Tech enters farms, consumer segments, procurement arrangements, and data sources. It is unlikely that these advancements may be reversed. As platform capitalism develops and expands it reaches rural agrarian formations in the global South. The local dynamics and history examined in this paper have determined Agri Stack's scale, complexity, and state support, putting rural India at the forefront of this transition.

A political economy view shines a light on the changing dynamics between fractions of capital. In joining this discipline, this research attempts to move beyond mainstream development approaches that view technological transitions as a coherent, win-win situations and beyond deterministic explanations that overlook the agency of different groups. This research has instead focused on a moment of class agency portrayed in the case of Agri Stack. Thus, it has uncovered the winners and losers of this transformation, deepening the understanding of the parties involved. Further, this work points at the importance of engaging with essential questions of agrarian studies when studying contemporary capitalism. These questions will only become more relevant as of platform capitalism expands into the rural global South and beyond.

This paper has presented platform capital: a fraction of the capitalist class with unique economic characteristics. Platform capital businesses are well-funded risk-takers which challenge norms in their aggressive strategies to create monopolies. The expansion of these businesses in rural northwest India is explained by two forms of pressure. Firstly, data-backed financial speculation of agricultural commodities. This pressure rises with crises, such as the COVID 19 pandemic and the Russia-Ukraine war. Secondly, the search for cost cuts by grocery retailers' competition strategies. This pressure has been increased due to the rise in competition and investment in the Indian grocery market. Together, these pressures have pushed several platform capitalists into rural India. Following these motivations, it is expected that platform capital will attempt to push down the prices of agricultural commodities, speculate, hoard, and gain more beneficial trading conditions. This is what will be disputed with large-scale commercial farmers.

This fraction of capital will in turn face decreases in profit, price fluctuations, and a loss of negotiation power. Historically, it has been protected from such threats by the mandi system and other state interventions. The fraction's prosperity depends on these arrangements. These have been persistently protected by the state until recent times. However, if successful, platform capital may bypass these arrangements. Moreover, the passing (with later retrieval) of the 2020 Farm Laws reveals that large-scale commercial farmers in northwest India may be losing state alignment and support. The launch of Agri Stack, done in this context, may thus be a critical sign of this loss. Therefore, the struggle over Agri Stack, is a struggle for state sponsorship and hegemonic control between the two fractions of capital examined.

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## Annex I: Summary of ten Agri Stack Memorandums of Understanding

MoU Partner/ Activity agreed	AW S	Jio	Microsof t	Cisc o	Ninj a cart	Agri bazaa r	Patanjal i	Esri	ITC	NeM L
Cloud services	✓	✓	✓	✓			✓			
Provider procurement	✓				✓					
Startup development	✓			✓						
Pilots development and deployment	✓	✓	✓	✓	✓		✓	✓	✓	
Communication and publicity	✓	✓	✓	✓	✓		✓	✓		
Technical advisory for development	✓		✓	✓	✓		✓	✓		
Applications development		✓		✓		✓	✓	✓	✓	✓
Hardware provision		✓							✓	
Farmer services (analogue)							✓			✓
Program management and governance		✓	✓	✓			✓	✓		
Market and farm data collection				✓		✓				
Data analysis	✓	✓	✓	✓		✓	✓			
Inputs/outputs marketplace					✓	✓				✓
Onboarding and technical support for external parties					✓	✓	✓	✓	✓	✓

Source: original production based on ten MoUs (Ministry of Agriculture & Farmers' Welfare & Agribazaar, 2021; Ministry of Agriculture & Farmers' Welfare & Amazon, 2021; Ministry of Agriculture & Farmers' Welfare & Microsoft, 2021; Ministry of Agriculture & Farmers Welfare & Cisco, 2021; Ministry of Agriculture & Farmers' Welfare & Jio, 2021; Ministry of Agriculture & Farmers Welfare & ITC, 2021; Ministry of Agriculture & Farmers' Welfare &

NeML, 2021; Ministry of Agriculture & Farmers' Welfare & Patanjali, 2021; Ministry of Agriculture & Farmers' Welfare & Ninjacart, 2021; Ministry of Agriculture & Farmers' Welfare & Esri, 2021).

## Annex II: Summary of key research sources and insights derived

Actor investigated/ Source		News articles	Political economy literature	Government reports and publications	Business reports and publications
Farmers	Analysis derived	Reactions of different farmer groups to policy and market changes	Formation of the fraction of capital (large-scale commercial farmers in northwest India)	GoI's explanation on the conditions of agricultural production and prospective for the sector	Private sector view of farming today and envisioned future
	Key sources	Tricontinental, Down To Earth, India Today, ZD Net, Business Standard	Dasgupta (1977), Omvedt (1981), Lerche (2011 and 2022), Patel (2013), Gill (2021)	GoI's report on 'doubling farmers incomes'	Reports/publications from McKinsey & Company, Bain & Company, Boston Consulting Group
Platform capital	Analysis derived	Businesses' actions, disputes between companies, voices of companies	Actors economic activities contextualized	Relationship between Agri Stack partners and the GoI, expectations for Agri Stack	Emerging opportunities and pressures key companies are acting upon, strategies they are following
	Key sources	Bloomberg, BBC, En-trackr, Business Standard, Forbes	Gill (2021), Parthasarathi and Athique (2021), Lerche (2011, 2022), Thomas (2019), Hendrikse et al. (2022)	Memorandums of Understanding (MoUs) between the GoI and Agri Stack partners	Reports/publications from McKinsey & Company, Bain & Company, Boston Consulting Group
State	Analysis derived	Process of liberalization, debate around government initiatives	Historic account of the transformation of the state's relationship with agriculture and technology capital	Context and detailed development of Agri Stack	
	Key sources	Tricontinental, Down To Earth, India Today, ZD Net, Business Standard	Gill (2021), Lerche (2011, 2022)	NITI Aayog's strategy for artificial intelligence (2018), Agri Stack MoUs, government websites on digitally based initiatives	

Source: original production.