

A new social contract: achieving social justice in an era of accelerating change in the agricultural sector

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Abstract

Agriculture addresses Sustainable Development Goal (SDG) 2, that of ending global hunger. To be sustainable, agriculture must address the local challenges brought about by changing consumer demand, rising populations, demographics and a shifting environment, including lower allocations in the national budget. The two leading producers of rice in Asia (Thailand and Viet Nam) are not able to solve the problem of malnourishment, with their agricultural production always at risk from climate change and unsustainable farming practices. Smart farming is predicted to solve the problem in food security by digitalizing to save production costs; however, by switching to the full use of technology it is displacing labour, as evidenced by several country studies presented in the paper. A new social contract would change the scenario to deal with the violation of workers' rights and the lack of government support for sustainable smart farming. The new social contract must be one which acknowledges the gaps between traditional and modern farming and integrates employment, social protection and sustainable development.

Introduction

A social contract was formed in the seventeenth century (Locatelli 2022) in the scholarly work of Thomas Hobbes (1588–1679) and John Locke (1632–1704) in England and Jean-Jacques Rousseau (1712–1778) in France. Under Thomas Hobbes's conflict model, people lived in a state where there were no rulebooks and with boundless autonomy (Huntjens 2021). This model was soundly refuted by Rousseau (1762), who believed that humans are compliant but may renounce their distinct rights for political freedom. Thus, if the government assumes supremacy over the public, the social contract is broken and citizens are no longer duty-bound to obey (Duignan 2023). Thomas Hobbes referred to the social contract as the transactional relationship between the government and its citizens. It can be a formal or informal means whereby citizens, government, businesses, employees and civil society organizations operate under accepted conditions, as well as the behaviour and responsibilities of societal actors. Debatably, the power of the state can only be legitimized if it comes from the people; the government is therefore obliged to fulfil its promises and, in return, the citizens waive their freedom in exchange for security (Gaskarth 2017). If the government for any reason fails to uphold the rule of law and the cause of justice and equality, the people can always exercise their power, within the bounds of law, to ensure that the ideals of the constituents are upheld (Guinigundo 2022).

But what is the role of the government in delivering the social contract, how can it deliver and how can it build the trust of its constituents? The legitimate government must be a guarantor of public safety and order; it must ensure that laws are enforced, improve society's welfare by addressing market failures and spend public resources on providing citizens with goods and services, including security (Naidoo 2022). Government, however, needs assistance from its citizens, including the non-actors, to create the needed change,

to regulate, to persuade, to coerce and control.¹ In essence, the social contract is an implicit agreement among the members of a society to cooperate for social benefits at the cost of sacrificing some individual freedom, which they cede to the State.

Further, the social contract defines the relative roles of employers and government as they relate to social protection, employment rules and taxation. In the seventeenth century, the social contract expanded to provide protections related to retirement pensions, healthcare, safe working conditions, working hours, vacations and family leave. Ideally, social contracts adapt to societal and economic changes to remain effective and support social and economic stability. The social contract terms of agreement may present a varied scenario depending on the context involved, but will focus on employment and security issues and opportunities and other forms of social protection to help address people's needs (Shah 2022).

This paper discusses the basic models of social contract from various viewpoints, their application in the digitalization of Asian agriculture, the costs and benefits of smart farming, the gaps arising from implementation of such contracts and the role of government under the new social contract. Philippine agriculture is also showcased in the study and analysed from the perspective of smart agriculture, along with the gaps in its implementation. Gaps in precision agriculture have become the basis for the implementation of the new social contracts.

Status, challenges and opportunities in Asian agriculture

The current population of Asia is 4.8 billion (for 2023; United Nations estimates), which is equivalent to 59.22 per cent of the world's population (Worldometers 2023) with a per capita gross domestic product of 8.18 per cent (International Monetary Fund 2023). The population is predicted to rise by 34 per cent by 2024, which is an important driver for the market. The middle class is projected to account for at least 65 per cent of the population by 2030, which will trigger demand for higher quality food. Indonesia, the Philippines and Viet Nam have the largest populations so far, including their middle-class populations, which drive the demand for food (Musa, Basir and Luah 2022). It is no surprise, therefore, that the way agriculture produces food to feed the world has changed tremendously because of changing environments. Asia should therefore be quick to embrace solutions to intensify productivity; it has to live up to its name as the powerhouse for production and supply of food, with the largest rice exporters (Viet Nam and Thailand), not to mention the top three exporting countries for pineapples, bananas, mangoes, sugar, coffee, cashew nuts and cassava (Kauffman 2022). Asia also hosts growing markets.

¹ In order to define its organizational legitimacy, the government may be inclined, using its formal authority, to enact policy and enforce laws as a form of coercive force to control individuals or organizations (McQuarrie, Kondra, and Lamertz 2013).

Smart farming

Climate-smart agriculture (CSA) has recently gained global popularity, as it allows for the introduction of new technologies in agricultural activities, allowing farmers to optimize their work and get better results, such as higher productivity, with lower financial costs (Sundberg 2017). CSA uses a range of internet of things (IoT) products, smart irrigation and smart greenhouses, where crop production is monitored using digital tools, which paves the way for "Agriculture 4.0". Among the smart farming technologies used are, first, machine learning, which predicts changes in climate, soil and water parameters, carbon content and the spread of diseases and pest. Second, is smart farming sensors, which help farmers monitor the smallest changes in the environment and the field using real-time data; third, are the drones and satellites whose cameras help growers create regularly updated maps to monitor remotely without needing to go to the field in person, and, fourth, the IoT, which gives farmers the opportunity to combine all the tools and solutions into one system.

The case of the Philippines – smart farming status and challenges

Oi (2023) informs us that Philippine agriculture is the primary source of livelihood for rural Filipino families and is considered the backbone of the country's economy. According to the latest census of agriculture and fisheries of the Philippine Statistics Authority, the Philippines has 5.56 million farms and smallholdings covering 7.19 million hectares and contributes about 18 per cent of the country's gross domestic product. However, the industry has been facing several challenges in recent years. Agricultural productivity in the Philippines has been lagging behind its South-East Asian neighbours for many years. Reyes (2023) described Philippine agriculture as supplying 30 per cent of the country's labour force and 9 per cent of its gross domestic product, even though the sector suffers from very low productivity, limited access to credit and insufficient infrastructure. It also faces the impact of climate change, as the country is prone to natural calamities, with an annual average of 20 typhoons and droughts, which disrupt production and cause damage to crops worth billions of pesos. With limited financial means, farmers rely on loans to raise capital for farming and the drop in production exacerbates their situation, exposing them further to high debt accumulation. Other challenges include a growing population (150 million by 2050) with changing dietary preferences and an ageing farm labour force, poor market access and information services and limited investments in agricultural research. Most farmers are old, with an average age of 57 years and a life expectancy of 70 years. In addition to the deterioration of agricultural land, the socio-economic vulnerability of farmers exacerbates the poor quality of farm-to-market roads and the lack of processing facilities. Data are often outdated or unreliable, with no access to quality technical information, including market potential, and this puts a strain on research, innovation and policies which might benefit farmers.

CSA implementation: Among the many cutting-edge smart farming technologies used in the Philippines are robots, temperature and moisture sensors, serial images and Global Positioning System technology. All of these allow for more profitable, efficient, safe and environmentally friendly farming practices. Even without human intervention, automation allows for a more consistent distribution of fertilizers, pesticides and water in the field, ensuring the success of innovating farming. Some climate farming techniques were implemented a long time ago, such as the anti-climate-change sloping agricultural land technology and the system of rice intensification to increase irrigated rice productivity. The use of information and communication technologies was extended to fisherfolk groups, and the online monitoring system was introduced to record agrofishery information and monitor reports, especially during the COVID-19 pandemic.

CSA challenges in smart farming: First, the digitalization of agriculture, which reduces the share of manual labour; second, the lack of stable internet connections, which are not available to all regions; third, the low awareness of the modern systems adopted and the lack of understanding of some its features; fourth, the lack of standardization, with many suppliers and manufacturers producing machines which are not compatible and smart farming requiring machine standardization. Another challenge is that utilization of digital technologies calls for basic literacy and computer science skills, as well as special technical skills; digitalizing the industry will change the nature of jobs and demand for labour and skills considerably. Another source of problems is political interference. The Government has made funds available for rural development, including smart farming technologies. Politicians use these projects to serve their own interests, or conduct them in areas where agricultural development is not a top priority. Even if the project is implemented, political leaders without a technical background might make decisions on purchasing machines or other technologies, resulting in technology mismatches. Another challenge is the lack of training among extension personnel, who should be technically up to date; this lack of training leads to failures in implementing CSA.

Benefits of CSA

Precision agriculture optimizes crop production and reduces the environmental impacts to increase yields, save costs and manage risks. Farmers can monitor the soil, weather and crop conditions, allowing them to apply the right number of inputs, such as water, fertilizer and pesticides, at the right time and in the right place. This reduces waste and pollution, meets the increasing demand for sustainable and responsible food production and contributes to global food security and environmental goals. Below are some Asian countries' positive and negative experiences of CSA, with their smart farming methods and achievements.

Viet Nam admitted to having low technological competence, given the complexity of smart farming methods. So far, Viet Nam has very little investment in research and development although, currently, precision agriculture is being adopted by large-scale farms with financially strong investors. Major difficulties range across access to credit,

small-scale farms, slow progress in land consolidation, poor infrastructure, lack of market information and lack of well organized distribution channels. Another is that, even when farmers are able to access the internet, there is still a lack of reliable market information providers, thus they may not be able to benefit from modern technology. Agustin, Alcaraz and Bristol (2022) reiterate the role of agriculture in providing employment and essential agricultural commodities for the citizens. Automation due to Technology 4.0 lowers the demand for labour, which poses a threat to a large percentage of low-skilled agriculturally based workers. The lack of access to the internet was traced to two major obstacles, namely the fragmentation of markets and the shortage of financially small sustainable business models supposedly attracting private investors to provide technical solutions for small-scale production. Despite modernization by members of the Association of Southeast Asian Nations (ASEAN), Viet Nam is not concerned about being left behind. De Clercq, Vats and Biel (2018) revealed that government has slowly realized the benefits of precision farming and has been the enabler of Technology 4.0 with financial incentives and infrastructure for trade promotion, including a training programme.

Thailand was the first South-East Asian nation to adopt agriculture biotechnology (Imson 2022). According to findings of Thai scholars, smart farming has major advantages, including smart agriculture that can help farmers to work with fewer mistakes, which helps to reduce production costs and expenses that farmers would otherwise pay unnecessarily. Smart agriculture can help to increase productivity as well as the quantity of agricultural products, which can bring better economic returns and living standards for farmers. The implementation of smart agriculture could help to reduce the number of labourers in the agricultural sector and replace them with drones, which is more profitable than hiring labourers. Accordingly, they see smart farming as a type of agriculture driven by modern technologies, innovation and knowledge, such as handy drones and laser land levelling for rice paddies. Meechoovet and Siriwato (2023) confirmed some benefits of smart agriculture, which can reduce costs while increasing productivity and help to reduce the use of labour. There was some resistance, especially with elderly farmers considering the technology costly and a lack of sufficient knowledge about technologies. Data from a 2020 study by the Food and Fertilizer Technology Center for the Asian and Pacific Region Agricultural Policy Platform on smart farming in Thailand revealed that there were several barriers to growth, namely: the ageing population of farmers, labour shortages, lack of access to proper smart technology resources, lack of funds or capital and poor implementation of national smart technology policies. Smart agriculture can be expensive to implement and has a high maintenance cost and technologies that require technical skills, precision and specific experiences to make it successful. For one thing, applying smart agriculture is a very new approach that some farmers consider complicated to use. For these reasons, ageing farmers are resisting the use of technology. To date, farmers still have to pay high interest rates on their agricultural loans. Moreover, there are still few smart agriculture service centres in Thailand and they do not cover all areas requiring attention. Thailand is currently confronted with a farming society that is ageing and has constantly been working to attract more youth. The Department of Agricultural Extension has set up “Young Smart Farmer” programmes to encourage

young people to enter the agronomic networks to replace over 50 per cent of farmers who have retired. The initiative aims to produce new agricultural “young blood” to achieve maximum agricultural capability by engaging technology to improve yields and other commercial aspects, including production capacity, management and farm marketing (Tortermvasana 2022; Bangkok Post 2023).

In order to reduce import dependency and prioritize food security, **Malaysia** has turned to smart farming with the use of technology or the IoT, with remote-controlled sensors and robots that can monitor for precision farming. Some aquaponic farms also create fish farms to ensure solutions to food security problems (Hazzan 2023). Self-sufficiency has been described in the Malaysian National Food Security Policy Action Plan 2021–2025, which aims to boost food production with the use of technology and economies of scale while strengthening the value chain for a sustainable food supply.

To optimize space, urban farming is also encouraged to inspire many to grow crops around their own homes and small gardens. These methods introduce many varieties of plants in a limited space compared with traditional farming. The adoption of the IoT is expected to grow considerably in Malaysia with the arrival of 5G technology. The Malaysian Communications and Multimedia Commission recognized 5G-enabled precision farming as the next smart farming platform, featuring an artificial intelligence (AI)-driven automation platform that allows predictive growth modelling, remote global monitoring and control, thus making farming possible anywhere (Sharon 2020). Online resources such as mobile applications can help with precise planning, implementation and data collection for their resources and produce. Challenges come in the form of weak imperatives, and the fact that farmers have been used to conventional methods of farming. Another challenge is the interoperability² of different standards, with machines becoming more farmer-friendly (Fakhrudin 2017). There is a lack of knowledge about various technology operations (including the maintenance of drones) which eventually becomes disastrous for farmers. There is lack of good network bandwidth that, if not dealt with, will become problematic (Balafoutis et al. 2017).

Similarly, **Brunei**, in its bid to attract more youth into the agriculture sector, has started to adopt smart farming. With the internet, young people in Brunei are becoming better informed about modernization in agriculture; they learn approachable methods to start experimenting with small farming systems from the comfort of their own homes (Musa, Basir and Luah 2022). Aquaponic farms, for example, help to preserve environmental amenities by utilizing clean energy and recycling water, making smart farming possible, feasible and sustainable, even with limited space. Brunei also provides agricultural solutions using smart farming methods and technologies such as precision farming software, sensors and machineries. Challenges so far relate to the widespread

² Digital transformation in smart farming suffers from interoperability issues due to overwhelming classes of technology used such as the IoT, big data, artificial intelligence and robotics in the form of drones or sensors, which are capable of gathering large volumes of data. Farmers are not trained in how to manage these data and implement automated decision-making. Processing the data also requires tedious manual processes and analytics executions (Roussaki et al. 2023).

deployment of the IoT from the lack of policies for its integration in farming; the low rate of investment in the project, with a trade-off between technology implementation, with its high costs, and the potential for profit. Large gaps are seen between service providers and service users, including the ability of the farmers to use advanced technologies. Another issue for consideration is security and privacy, including protection of data from cyber attacks. Cloud servers can be attacked using the internet to gain control rights. On the other hand, farmers need to improve their skills to apply IoT solutions to their farm.

The situation in **Cambodia** is not isolated compared with that of other ASEAN members. Some challenges include imbalances between the social and economic power to move towards inclusion, transparency and accountability, especially among those who resist change, which affects the rural areas where subnational policies are narrow in scope. Small farmers, most especially, are excluded from decision-making processes, including budgets, agricultural inputs, land reforms and food distribution. Policies are still centralized.

Singapore is a small and densely populated country with a lack of natural resources, and less than 1 per cent of its land is dedicated to agriculture; thus most of its food is imported. Singapore has come up with technological innovations and ingenious new agricultural methods in its efforts to become the urban agrifood technology hub of Asia. The technology in agriculture includes IoT data analytics, which controls environmental conditions such as light and irrigation and tracks temperature, humidity and the growth of crops; automated systems such as auto-feeders and automated pump systems and shed-cleaning bots that reduce the need for manual labour; and hydroponic systems eliminating the need for pesticides and fertilizers, while optimizing the nutritional value of harvested plants (Ai Kok 2020).

Non-ASEAN countries, such as China, Japan and Sri Lanka, are also showcased here to show the diversity of CSA practices.

China, for example, has been implementing CSA to secure food security for the 1.4 billion Chinese population (Hengde 2023). Innovation in agriculture has taken the form of smart farming, and intelligent farming has become a phenomenon as agriculture has become more scientific (Gong 2023). CSA technology has now strengthened its scientific research and development, and using drones, multispectral imaging and biological control techniques have increased precision in fertilizer and pesticide applications which have improved agricultural output (Lei 2023). In the case of China, implementing CSA rests on the following principles: coping with climate change to ensure sustainable development; attaching equal importance to mitigation of and adaptation to climate change; and amending traditional production methods and consumption patterns to cope with climate change. The Government's countermeasures against climate change are largely divided into greenhouse gas mitigation measures and adaptation measures for climate change (Kim 2021). Apart from the above-mentioned CSA practices, in highly urbanized areas indoor food plants are cultivated in a form of vertical farming and as an initiative to overcome various barriers to the adaptation of smart farming technologies.

Gong (2023) notes that Chinese farmers are able to gain access to credit to finance smart farming technologies and insurance to control the risks in farming. The Government has supported agricultural modernization for about 3–5 years to allow for full integration of technology-driven farming all over China. It has now focused on capacity-building to respond to farmers with problems in agricultural production, including the challenges of climate change.

Several issues have affected smart agriculture in China, starting with the high cost of installing new technology, the high rate of migration of agricultural workers to urban areas and, ageing. There is also the decrease in arable land from 334.1 million acres in 2012 to 316.29 million acres in 2021 (Van Wyk 2022). Other problems came in the form of rapid urbanization, environmental damage and increasing cost of the land. Wijdooge (2021) reiterates that China is still facing shortages of food due to farm degradation, water scarcity, rapid urbanization and a lack of talent and ways of selling the farmers' produce, as only 30 per cent of modern farming producers engage in e-commerce selling (Wijdooge 2021) despite the benefits it contributes to modernized farming.

In **Japan**, the Government plays a crucial role in increasing technology implementation by corporations, accelerating production efficiency and using agricultural policy reforms to promote the construction of data-sharing platforms for science and technology. Japanese smart farming solutions include the use of drones and self-driving vehicles, reforms in chemical spraying and rapid and comprehensive roll-outs of the necessary infrastructure, such as the satellite system, as an agricultural data collaboration platform (Temmen and Schilling 2021). To accelerate the digital transformation of agriculture and encourage agricultural corporate ventures, the Government has also announced inclusive policies and created forums for mutual support. It is granting needs-based financial support to farmers and corporate entities to help them to adopt agricultural machinery and technology (MAFF 2022). All in all, accelerating the digital transformation of agriculture is not only a national issue; the direction that smart farming should take is being sought worldwide (Washizu and Nakano 2022). Agriculture has its local specific culture and practices, as well as specific geographical conditions, but the experience of implementation in the agribusiness system in Japan could provide lessons for other developing regions seeking further technology dissemination (Washizu and Nakano 2022).

In **Sri Lanka**, smart technologies are used at each step of the farming system, including crop development, land management, breeding, agrochemical usage, wholesale and distribution, processing, storing and marketing, which opens up opportunities for growth in the sector. Digitalization of agriculture is gradually occurring across a broad spectrum of activity, from low-impact solutions using mobile devices and platforms to provide management decision services to medium- and high-impact smart digital farming. In the past, nobody would have assumed that Sri Lankan farmers would adopt mobile phones in their farming operations. Today, many young and middle-aged farmers use a short messaging service, voicemails and other apps for marketing and weather alerts. The "e-agriculture" strategy has identified some of the potential applications of

information and communication technologies to improve existing agriculture system information collection, efficiency and services. Challenges take the form of research and development projects to improve the use of modern technologies in the agricultural sector, owing to the lower resource capacity of smallholder farmers, including lack of capital and other resources and poor access to markets and institutions, including extension services, which may affect them and put them at a disadvantage in reaping the benefits of technological innovations in agriculture. There is also a lack of enabling policy in the digital technologies in agriculture, as well as poor access to infrastructure connectivity and a lack of development in data collection and analysis.

The need for a new social contract

It has been established in this study that smart farming can accelerate agricultural transformation; thus CSA is not a sectoral issue, but is national in character. This is the direction of the next development agenda for lawmakers. Many national policies, especially national constitutions, promised support for constituents, especially in the development of human capital.

Obviously, violations of the social contracts exist in the form of challenges or barriers to improving farm productivity and displacing rural labour. In the many case studies presented, rural labourers are older, with less education, making it more difficult for the farmers to adopt the new technology without the support of the government. The new social contract will encourage young people to focus on smart farming, but the lack of internet connectivity is a potential barrier, preventing the young generation from engaging in agriculture, especially the Gen Z entrepreneurs who have the potential to lead in agricultural innovation.

The new social contract can focus on insightful policies which create platforms for mutual support. One area is financial support for farmers in the form of loans, subsidies or guarantees to help them adopt the new agricultural technology or farmer's loans from private lending institutions, especially for those farmers who continuously use arable land, and especially in favourable geographical areas. The new social contract can create policies to entice young people to remain in agriculture. With the younger generation, adept with technology, smart farming will become less of a challenge and food security will be sustained.

Obstacles may also come from policy and regulatory barriers. In general, farmers may face challenges related to such barriers that make it difficult for them to implement CSA practices. For instance, there may be restrictions on the use of specific technologies or practices, or a lack of support from government agencies for funding or technical assistance. Governments, along with concerned non-government groups and communities, bear the primary responsibility for increasing the feasibility of CSA and other sustainable farming practices, especially in the unfavourable conditions of developing countries.

Another focus of the new social contract is intervention by the government to address market challenges, where farmers need help in finding markets for their CSA products, especially with the limited demand for them. It is difficult for farmers to recoup their investments in CSA practices and make the transition economically viable.

The new social contract must address violations by politicians who exploit projects intended for smart farming and redirect the funds for their own benefit. Aggravating the situation is the lack of intervention of their national government to tackle the misuse of such funds. Farmers may resist new technology but sufficient funding, incentives and technical support can change their perspective; if those things are absent, this may contribute to farmers pushing back against new farming technology.

In the Philippines, the old social contract was clearly violated, as the Government failed to intervene in the opportunity to increase the productivity of agriculture. This aim was clearly stated in article 12 of the 1987 Philippine Constitution (National Economy and Patrimony) where the goal is the more equitable distribution of opportunities, income and wealth, with a sustained increase in the amount of goods and services produced by the nation for the benefit of the people and the expansion of productivity as the key to raising the quality of life for all, especially for the underprivileged. Full employment should be based on sound agricultural development to make full and efficient use of human and natural resources (Republic of the Philippines 1987). Not supporting the smart farming endeavour as an opportunity to improve agricultural productivity and increase food security was a clear dereliction of duty by those responsible for the country's governance. Failing to monitor the working conditions of farmers and many workers alike was a clear violation of occupational safety and health standards, with injuries and deaths through accidents occurring in the agricultural sector. The hiring of contractual workers without social protection was a clear circumvention of the law. The Bill of Rights provision of the 1987 Constitution that guarantees the participation of citizens in the political process and their right to collective bargaining was totally neglected.

The violation of the social contract occurred in the form of challenges faced by the workers. First, contractualization³ (five-month contracts only) is legal under the Philippine Labour Code and allows employers to circumvent the regularization of workers to avoid paying regular employee benefits. In economic zones, for example, workers continue to work for private employment agencies under fixed-term arrangements, mostly casual and temporary in nature, which hamper organizing activities of unions. Many workers complain of the inadequacy of salaries and benefits. The Department of Labour and Employment failed to inspect labour standards in this area owing to an alleged lack of funds and human resources. The private agencies continue to operate despite the lack of certificates of compliance, which poses an imminent danger to the workers. Also,

³ Contractualization refers to labour-only contracting, where the contractor merely supplies or places workers to perform a specific job or work for a principal, and the elements enumerated in section 5 of the Department Order No. 174. (DOLE 2017).

union leaders are red-tagged (i.e. labelled and harassed as 'communists') and many are assaulted (Human Rights Watch 2021). If the agencies are ever inspected, non-compliance with wage laws was penalized by minimal fines. The enabling policy under the Philippine Development Plan, supposedly promoting inclusive growth and poverty reduction, remained a plan and promise based on intentions. The move towards multi-stakeholder participation was hampered because of the direction taken by the Government. Overall, economic growth remained the focus of the Government but workers' welfare was left behind.

Given the above considerations, the new social contract must free people from the fear of insecurity, lack of trust and a shrinking policy space. It must recognize the large gap between changes in the world of work and enabling policies, and institutions like the government must be there to manage that gap. It must integrate employment, sustainable development and social protection, based on equal rights and opportunities for all.

The role of trade unions

Employment insecurities undermine the relationships between workers, employers and the government, with consequence of distrust for the role of the government to protect its constituents. Decent work deficits represent government failures to provide quality services to the public (Murtin et al. 2018). Evidently, technology contributes to the suffering of agricultural workers, who suffer from the fall in real wages or the serious declines in real incomes compared with purchasing power which contributed to their situation of poverty. The global issues brought about by globalization should not be imposed on workers alone, especially those working in rural areas where purchasing power and standards of living are sacrificed.

Trade unions should play an active role in organizing peasants and rural working women into cooperatives for delivery of agricultural inputs, for the marketing of produce and for rural industrialization to create jobs in rural areas, eventually eliminating unemployment and underemployment. Trade unions should play a role in fixing the statutory minimum wage, and meeting the demands of people in rural areas, including basic needs like potable water, supplies, electricity, primary health care, education and social services.

The trade union movement in general must cooperate with environmental organizations to change industrial development into ecologically more viable development, and should actively involve populations in solving environmental problems nationally and globally. It is known that agricultural workers are the lowest paid and poorest in the world, with wages, working conditions, social security, health and safety standards lagging behind those in the industrial sector. The vicious cycle of poverty reflects their conditions, with child labour on a massive scale and deprivation of the right to freedom of association. They also suffer from the effects of indiscriminate application of pesticides and herbicides and the destruction of water resources. All of these challenges require a strong trade union presence, especially when the workers are employed by transnational companies.

Trade unions at the federation level should launch educational campaigns among the peasant organizations and mobilize rural people to achieve self-sufficiency in food, and trade unions should assist this task. The organizing and bargaining agenda should be upheld at all times to safeguard the rights of workers to self-organization, ensure safety at work and continue to promote equality, guarantee equal pay for women and men, challenge racism and ensure social protection for vulnerable workers, starting with the proposed global fund for social protection.

Trade unions should be part of the new social contract, where new jobs can be created, where green jobs and infrastructure can consider hiring informal workers, where people enjoy a decent living and purchasing power is improved to help to invigorate the economy. Trade unions should ensure that, even if there is flexibility in work across all job levels, there is proactive health or provision of support for particular needs, taking a deliberate stand on inclusion, equity and diversity.

Role of the International Labour Organization

The role of the ILO is to promote a new social contract, as suggested here. As an international organization, it has to recognize the impact of technological advances that affect jobs. A powerful solution must be found in a series of tripartite consultations to ensure that the transition of workers from traditional jobs to jobs in the new world of work is well managed.

The ILO must have a vision of the future, where this new social contract, focused on addressing the difficulties of workers, will be strictly monitored, results shared with the constituents and solutions deliberated. The social contract should contribute to solving the wider disparity in job status and address the impact of climate change and COVID-19.

The ILO should make efforts to increase cooperation between employers and workers to address societal challenges, including Industry 4.0 (the fourth industrial revolution) which disrupts work on a massive scale. It must work towards policies that bring solutions to inequality to a new level and break social contracts in the absence of corrective measures. It should be a transformative strategy, capitalizing on technology, innovation and the drive to make vulnerable workers affluent in due course.

The ILO should work towards policies where, without discrimination (formal or informal), workers shall be accorded equal rights to self-organization, with the same privilege of forming or joining a workers' organization for collective representation. The same attention must be given to informal employment and work under non-standard contracts.

The ILO must consider a policy mandating Member State governments to acknowledge not only the formal sector, but also the vulnerable workers in the informal economy, giving them platforms to voice their concerns. This shall include the gig economy, which is currently considered as vulnerable and without social protection.

The new social contract must involve the tripartite organizations, where workers are given assurances in terms of job security, acquiring skills and training to improve their incomes and benefiting from improved labour standards and social protection and a social dialogue moving from instability to stability, especially those organizations that provide measures from technology and climate change mitigation.

Conclusions

Agriculture plays a central role in addressing SDG 2, which aims to end global hunger by reducing food insecurity, which is a huge barrier to development in many countries, to reduce malnutrition and to promote sustainable agriculture. Agriculture in Asia is, however, facing challenges, with the three ongoing shifts in consumer demand, demographics and a shifting environment. Despite the region's prosperity, malnourishment persists in various forms, and agricultural production is exposed to risks from climate change and unsustainable farming practices. This exposes the workers to precarious work and informality of labour, which bring more challenges for trade unions, especially in their organizing activities.

Smart farming brings in technology to increase food production, while minimizing input costs, which include labour as a factor in production. However, half the labour force is to be found in agriculture, and digitalizing the sector will mean disruption of labour. From the case studies presented on economies in Asia adapting smart farming, it is very clear that labour was sacrificed and set aside in favour of technology-driven methods that could help to increase productivity. Indeed, technology does boost output, but it also exacerbates social discomfort and raises the question whether inclusive growth has been achieved. Farmers confirmed high productivity with lower input costs.

Countries in Asia adapting smart agriculture have noted the complexity of precision farming, with only large-scale farms adopting it, given the high cost of technology. The lack of internet access and very poor connections have been cited as major challenges by users, along with resistance by ageing farmers and the lack of interoperability of modern machines, including maintenance of drones. Challenges in the use of the IoT the lack of policies for its integration in farming, as well as the issues of privacy and security of data. There is also a big gap between smart farming technology suppliers and users.

While smart farming implementation is still in its infancy, governments are convinced that smart agriculture can resolve shortages of food. Intensive studies aimed at full implementation include potential financial support for farmers and possible extension services.

Recommendations

Technology enhances productivity, and mechanization is becoming the future of agriculture. However, it has exacerbated public disgruntlement and contributed to inequality, economic slowdowns and rising unemployment, leading to greater poverty which will eventually increase populism.

Governance actors should therefore rethink their social obligations and design appropriate policies and actions in delivering public goods. Where climate change becomes the main concern, policies must focus on environmentally sustainable protection. They must also deal with the consequences of automation for the ageing population.

In terms of the new social contract, the deliverables pledged by political leaders must take the form of State protection, participation, taking responsibility for failure, eradicating tensions and lessening the impact of inequality, poverty and exclusion.

There should be a change in mindset, requiring business owners to listen to the demands of workers. Informal workers should be embedded within the dynamic circles of relationships, rights and responsibilities, which allows for a new pattern of engagement, accountability and reciprocity between the State, capital and labour. Businesses, too, can only survive in a risk-averse environment and should form a new contract with the workforce, who have the resilience to continue to thrive on the challenges. Businesses must stay true to their commitment to the workers, and especially to the trade unions. Workers should increase their productivity for a more harmonized employee-employer relationship, where innovation and productivity are the main goals.

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