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### **FoodTech for Sustainable Agrifood Chain**

#### *Identity in the Age of Globalization Series*

In an era of booming population growth and dwindling resources, the fight for the future of agriculture has begun. According to IPCC and IPBES reports, there are 12 years left to act before the agriculture sector seriously deteriorates alongside the climate and biodiversity. Using land sustainably is the key to fixing how the world farms in order to save the planet. Undertaking a research project merging different fields within social sciences such as economics, governance, and innovation, Professor Renda is working on making the AgriFood chain more sustainable, hoping to tackle this problem. Renda believes applying AI and related digital technologies such as the Internet of Things to agricultural practices could mitigate the effects of climate change.

The agriculture sector right now accounts for around one-third of all global greenhouse gas emissions which in turn deteriorate the environment. The loss of biodiversity is having devastating consequences with melting of the Arctic ice leading affecting the whole Earth ecosystem, for example causing less precipitation in the West African monsoons. This in turn has decreased crop yield and increased migration from the affected regions. Similarly, around one-third of all food from human consumption is lost or wasted every year, with the US and Industrialized Asia leading the pack with 42% and 25% respectively of the share in annual wasted and lost food. At the same time, 820 million people have insufficient access to food. This is a problem that will increase in coming years with devastating consequences if we do not act now. Technology can eradicate this hunger without increasing food production, which is the promise of DigiTech. Digitizing AgriTech could avert about 10.8 to 11.6 million deaths a year, would free up much needed land, and cut carbon dioxide emissions by up to 8 billion tons a year.

What makes this digitization possible? The immense power of the ‘internet of things’ as a part of the emerging modern technology stack allowed for overwhelming amounts of data to be gathered by the internet. In fact it is estimated around one trillion devices will be connected to the ‘internet of things’ by 2035. This has the potential for a world in which there exists the four basic elements, and data. The AgriTech sector can utilize this power to improve agricultural practices, and already has seen a boom in areas such as post-harvest monitoring, good recovery, and freshness control. Deploying sensors in the soil and drones around land can gather data that will in turn allow AI systems to compute, for example, which foods are ripe and which are not in order to bring the sector to a surgical level of precision. However such an endeavor will require widespread connectivity and huge amounts of data.

Of course, there are downsides to utilizing AgriTech. Every new wave of technology innovation has brought an increase in market concentration and rising inequality in many countries. Trends of

financialization and digitalization have led to distancing from the part of the Value Chain where the value is created - the farmers. The rise of platforms, in turn, has diluted corporate responsibility for contributing to the sustainability of the economy, society, and environment. To rectify these issues, Professor Renda argues that decentralizing technology will bring more efficiency to the system and requires education to empower farmers and consumers. EU industrial policy needs to reallocate entitlements as close as possible to where the value is generated, giving the tools for data collection to farmers instead of big corporations.

The current model of agriculture faces problems such as market concentration, congestion, and lack of empowerment. A more distributed model necessary for the future calls for less market concentration, optimal governance, and requires education to empower farmers and consumers. Innovations such as Blockchain have brought about the possibility for a more distributed model of governance where every farmer has computing capacity and is able to gather data, as seen with the platform Hara in Southeast Asia. Yet it is key to keep in mind the DSC triangle dilemma, where systems cannot be fully decentralized, scalable, and consistent simultaneously. Pure decentralization will not be possible any time soon due to this trilemma.

How to manage data governance is the key question for the future. AI must be used to build a more sustainable world through its marriage to AgriTech, despite obstacles like connectivity, data availability, and policy frameworks. Professor Renda highlights a few areas for action such as enhanced data governance for small farmers and reorienting tech business towards sustainability. Digital innovation in agriculture and the decentralization of data are the way forward to sustainability and to fixing the planet.