Farmer-centric regional information systems

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Digital systems today

Digital technologies have made rapid progress in recent years, so much so that all important human activities have got on to digital platforms. Be it domestic requirement or otherwise, transactions are carried out virtually through digital platforms. Many wonder how this has been made possible and how smartphones transformed the world so rapidly. However, quick adaptation to rapidly changing technologies has enabled major changes to everyone's lives. Most countries are actively taking up digitization of many key activities and creating computational infrastructure to enable online platforms. Due to the growing needs and demand for digital modes of operation that involve internet and related information and communication technology solutions, many countries have given greater emphasis to digitization processes and moving into the realms of the digital economy. The world wide web is actually enabling economic connections, like never before, that are allowing growth of diverse businesses in a wider, deeper and more decisive manner. The reality of today's developmental process is a strong push towards digitally connected global economies. In such a situation, the flow of data across multiple countries is ever increasing and is positively impacting the world economy, irrespective of countries being big or small. In such circumstances, the Asia-Pacific region has a big advantage in surging forward in international trade due to a conducive environment for digital exchange, e-commerce and online supply chains.

The digital economy in the Asia-Pacific region

ESCAP, on the basis of its linkages and engagements with member States, could strongly support all countries in the region in adopting new and emerging technologies for regional development. There are countries already practicing digital technology-based solutions in the region that could help others to adapt through knowledge-sharing and capacity-building on a fast track. The region has made significant progress in cybersecurity; 35 countries have cybercrime legislation in place and 31 have cybersecurity regulations. In spite of the pandemic, most network operators in the region could cope with the increased demand and meet their country's needs.[59] The Asia-Pacific Economic Cooperation (APEC) has actively pursued this and has elaborate plans on the digital economy for Asia and the Pacific. In 2017, APEC leaders pledged to work together to realize the potential of the internet and digital economy and welcomed the adoption of the APEC Internet and Digital Economy Roadmap. This document emphasizes 11 key focus areas that cover a wide range of activities to enable digital infrastructure, interoperability, data security, digital economy and e-commerce. Similarly, management consultants McKinsey&Company has highlighted digital globalization by analysing global transactions, services and flows.[60] The analysis highlights countries' and companies' active participation in a web of flows that matter for growth as it results in ideas, research, technologies and best practices, globally. The digital economy in the Asia-Pacific region has also been examined, for example, in one study based on secondary sources for 43 countries in the region during 2012-2017. This research looked at the role played by digital skills in fostering development of the digital economy. The findings show that income levels affect the development of the digital economy.[61]

Digitally connecting small farmers

There is an urgent need to push for agriculture technologies in the Asia-Pacific region, considering global food security requirements. There is a great opportunity to connect farmers of many countries to integrated value chains to unlock their potential and move towards realization of better economic and financial gains.

Many countries in Asia and the Pacific have farmers with small or marginal land holdings of less than four hectares. These farmers account for a significant proportion of food production in the region. These farmers tend to confront various challenges, whether financial, economic, health or natural hazards. For all their efforts, they rarely achieve optimal levels of productivity or profits. If they can be connected through an integrated value chain and unlock the vast potential to obtain better financial, social and economic gains, there will be a unique transformation over time. This effectively means that an inclusive food value chain through widely distributed connectivity could enable diverse economic activities, particularly the huge market

potential for food grains in the region and across the globe. This could also lead farmers to learn new and improved mechanisms of agricultural production.

There are many advantages of connecting farmers to an integrated regional supply chain, which could also expand globally and spread across multiple regions, resulting in optimal gains and better use of resources. The multiplier effect this could have is significant, including quality consciousness, advanced advisories, better yields, improved farming techniques, better bank linkages, economic gains and much more. A unified platform for all small farmers helps in many ways, particularly with experience-sharing and problem-solving, as well as issues related to pests and diseases, addressing soil deficiencies and other field-related challenges that need real-time solutions. Farmers with prior knowledge of such issues could help in solving problems more effectively. In the long run, farmers could solve problems together and join hands to form their own affinity-groups, resulting in multiple gains and more progress towards sustainable development.

The use of mobile-based information technology for farming will likely spur greater acceptance of platform-based commercial activities and digital value chains in farming areas and rural communities in countries across the region.

Disruptive technologies for farming

Disruptive in nature, internet of things (IOT), smartphone and geospatial technologies are already playing significant roles in better agricultural management practices. Small farmers in Asia and the Pacific and other regions are learning to adapt to new information and communication technology (ICT) tools in farming practices and embrace precision farming. Today, IOT has the potential to teach many new lessons to the farming community with regard to resource optimization. Many farmers have started using IOT gadgets in their fields, such as weather sensors, soil moisture sensors, rain gauges, automated water pumping, solar power in fields, gravity-based drip irrigation and soil moisture-based watering schemes. IOT and ICT tools are also mobile-enabled and simple to use; reducing labour-intensive methods and optimizing the use of manure or enriched micro-nutrients. This is because the systems and gadgets are automatically controlled through artificial intelligence-based systems for farm-level decision-making. For example, in India and other countries, some IT professionals are taking up farming as a hobby, demonstrating that ICT tools and techniques bring increased yields and better economic benefits. Also, startups and unicorns are coming up with disruptive technologies and achieving rapid growth in business. In India alone, 44 startups transformed to unicorns just in the year 2021. Digital technologies can be nurtured to help the farming sector across the region.

In the context of networking small farmers within and across regions, it is also necessary to provide the required capacity-building, particularly on ICT tools and smartphone technologies and applications for farming.

Today, mobiles and smartphones are in every hand. Mobile network coverage stands at 98.6 per cent with both 3G and 4G network coverage above 90 per cent.[62] Hence, these gadgets can enable a farmer to carry out many activities, including secure bank transactions online. Farmers can handle all their financial transactions through simple mobile apps. For example, Unified Payments Interface (UPI) transactions have made a revolution in a country like India, where urban and rural dwellers alike are rampantly using the technology for day-to-day transactions. Also, these technologies can easily connect a small farmer to many potential buyers, and the buyer will know about the product and its details before buying. This also provides much-needed information to distributors and retail marketers.

Enabling technologies: space and information and communication technologies

Ours is a world of technological possibilities and every day, one observes new ways of doing things that are enabled through new and emerging technologies. Disruptive technologies have pushed traditional methods to the back benches. Mobile phones, unmanned aerial vehicles, the internet of things and space technologies are enabling a new paradigm of