



**MODEL BUILDING OF  
COMMUNITY NETWORKS  
LINKED TO SOCIAL ENTERPRISE AND  
LOCAL ECONOMIC DEVELOPMENT**  
AN END OF PROJECT SYNTHESIS PAPER



## ***Introduction***

In 2022, the Technological Innovations for Sustainable Development (TISD) platform, co-convened by the Association for Progressive Communications (APC) and the Institute for Social Entrepreneurship in Asia (ISEA) agreed to focus its initiatives towards building, strengthening, and mainstreaming community networks to contribute to bridging the digital divide in the Asia-Pacific region. Community networks (CNs) or Community-centered connectivity initiatives (CCCI) are endeavors that extend last mile connectivity, use frugal digital technologies, enable meaningful connectivity to marginalized communities and empower them to become stakeholders in digital transformation. These are shaped by engaging marginalized communities to have access to the internet and using connectivity to improve their quality of life. At their best, CN and CCCI endeavors also empower communities to own, govern and manage the digital resources. The partnership of APC and ISEA was premised on a common interest to explore the potential of social entrepreneurship theory, tools and practices to address social impact and sustainability issues faced by CNs and CCCIs, while also exploring the potential for CNs and CCCIs to become an important segment of social enterprises in the digital industry. As transformational partners of marginalized communities, social enterprises have been recognized as critical actors in engaging the poor to become stakeholders of equitable and sustainable economic development.

To substantiate this link between CNs and social enterprises, ISEA proposed a project to the Asia Pacific Network Information Center (APNIC) Foundation through the Information Society Innovation Fund (ISIF) entitled Model Building of Community Networks linked to Social Enterprise and Local Economic Development (MBCN), implemented from January 2023 to September 2024.

MBCN was meant to explore how connectivity can be embedded within existing social enterprise ecosystems to bring about meaningful connectivity, in the process addressing issues of social impact and financial sustainability that were becoming a major concern for CN initiatives as a whole.

The four partners chosen were organizations that would develop a community network model in partnership with social enterprises serving various segments of poor or marginalized communities in different economic subsectors or value chains across three different countries and sub-regions:

- In Bangladesh (South Asia): the Foundation for Architecture and Community Equity (FACE) in partnership with marginalized women artisans in Cox's Bazaar and Prokritee, a Fair Trade organization in the crafts subsector
- In China (East Asia): Sources for Action (SFA) in partnership with smallholder farmers, youth and social entrepreneurs engaged in sustainable agriculture and agro-eco-cultural tourism in Qiandongnan Miao and Dong Prefecture, Guizhou Province
- In the Philippines (Southeast Asia): the Philippine Rural Reconstruction Movement (PRRM) in partnership with Vizcaya Fresh! Inc. (VFI), a social enterprise in the organic vegetable value chain working with organic smallholder farmers in Kayapa, Nueva Vizcaya; and
- In the Philippines (Southeast Asia): Philippine Coffee Alliance, Inc. (PCAI) in partnership with community-based coffee enterprises (CBCEs) working with smallholder farmers in the coffee subsector in Nueva Vizcaya and Ifugao.

## ***Model Building Process and Tools***

ISEA facilitated a series of learning sessions and regular monitoring and evaluation meetings that engaged the partners in a process of reflecting and sharing insights based on their project implementation processes, needs and experiences.

On the ground, this aided the processes of selecting target communities, conducting community needs assessment (CNA), planning the CN initiative based on the CNA and actual deployment and implementation of the relevant elements of the CN initiative with the community partners and stakeholders concerned.

On the 11th month of implementation, a regional seminar-workshop involving all the partners entitled Model Building of Community Networks Linked to Social Enterprise and Local Economic Development was co-convened by ISEA and APC. This was held on November 7-10, 2023 in the Philippines. It was during this seminar workshop that the project partners developed a shared understanding of what a community network model is, focusing on six dimensions or elements. Building on the elements that earlier APC studies surfaced about CN models, the six dimensions are:

- People, Organizations, and Partnerships, which is concerned with key stakeholders and institutions playing critical roles in the CN initiative
- Technical and community network infrastructure that deals with the relevant technology and specific ICT infrastructure used
- Policy and regulatory environment that deals with the enabling laws, policies, as well as regulation restrictions impacting on the connectivity initiative
- Financial element that deals with the revenue streams and operational costs of the initiative
- Social impact that covers the stakeholder-based outcomes and benefits resulting from the initiative; and
- Sustainability that deals with the interaction of the various elements in bringing about mechanisms and strategies to ensure continuity and social impact beyond the project time frame.

What follows is an overall description of these four evolving models of CNs and a discussion of the six dimensions manifested in these evolving models.

### ***The Four Evolving Community Network Models***

While the project was implemented over a period of 21 months (January 2023-September 2024), the substantive period for implementing the activities on the ground to evolve the models happened over a period of 12-15 months, with the first and last few months spent on preparatory and wrapping up activities. In this context, what resulted from the initiative are not fully developed CN models but may be called EVOLVING COMMUNITY NETWORK MODELS EMBEDDED IN SOCIAL ENTERPRISE ECOSYSTEMS (CN-SE MODELS) that support the provision of sustainable livelihoods to farming and indigenous communities in developing countries. The 4 evolving models are:

- An evolving CN model embedded in a social enterprise-led crafts value chain in Bangladesh (CN-SE Model in the Crafts Value Chain)
- An evolving CN model embedded in a social enterprise-led organic vegetable value chain in the Philippines (CN-SE Model in the Organic Vegetable Value Chain)

- An evolving CN model embedded in a social enterprise-led coffee subsector initiative in the Philippines (CN-SE Model in the Coffee Subsector)
- An evolving CN model embedded in a social enterprise-led agro-eco-cultural tourism initiative in China (CN-SE Model Supporting Agro-Ecocultural Tourism)

### ***Evolving CN-SE Model in the Crafts Value Chain (Bangladesh)***

The Foundation for Architecture and Community Equity (FACE) in Bangladesh established a cellular router system for marginalized women in four villages in Ukhiya, Cox's Bazar to enable their becoming new supplier groups to a Fair Trade organization in the crafts value chain, Prokritee coupled with product development assistance from iDE. Given the remoteness of the four communities in Ukhiya, the CN-SE initiative provided internet connectivity and training that enabled the women to effectively communicate with product designers, quality checkers, and marketing channels. Internet connectivity was facilitated by linking with mobile operators primarily using unlicensed spectrum (2.4 GHz and 5GHz) that is permitted for community network distribution. The CN-SE initiative resulted to the women artisans developing marketable products that created a new income source or generated increased incomes for themselves and their households. The communities were assisted to form cooperatives with their own governance structures, that by the end of the project, showed strong ownership as they contributed resources and managed their respective internet packages.

### ***Evolving CN-SE Model in the Organic Vegetable Value Chain (Philippines)***

The Philippine Rural Reconstruction Movement (PRRM) enabled internet connectivity using Starlink set-ups in 3 locations that facilitated digital networking in aid of the farm planning, production and marketing functions of their organic vegetable value chain stakeholder-partners in Nueva Vizcaya. The stakeholders engaged were the organic smallholder farmers of the Kayapa Organic Producers Association (KOPA) which benefited from a Starlink set-up in two barangays in Kayapa municipality (Pangawan and Tidang) and their intermediary social enterprise marketing partner Vizcaya Fresh! Inc. (VFI) that benefited from a Starlink set-up in their main office in Bayombong municipality. The main benefit so far felt by the stakeholders was greater efficiency in terms of coordination and communications between and among the farmers, KOPA and VFI. The internet connectivity infrastructure also enabled KOPA to set up Piso Wi-Fi stations that retailed internet connectivity to students and villagers, which allowed them to generate a monthly income source greater than the cost of maintaining their monthly subscription fees for Starlink. VFI expects that their revenues from marketing organic vegetables and providing training services, coupled with new services exemplified by the Piso Wi-Fi would ensure financial sustainability for the CN-SE initiative.

### ***Evolving CN-SE Model in the Coffee Subsector (Philippines)***

The Philippine Coffee Alliance, Inc. (PCAI) developed an Internet of Things (IoT) system integrated with coffee roasting machines for community-based coffee enterprises (CBCEs) to enhance their efficiency by generating operational data (e.g. roasting times, temperatures, production outputs) to track performance metrics and make informed decisions. The PCAI was established by and serves more than 50 community-based coffee enterprises that use an AI-assisted coffee-processing system. This system that was earlier promoted by PCAI in partnership with government and social enterprise



resource institutions, as part of a package of agribusiness services that enabled indigenous communities, coffee farmers, women and youth to become co-owners and stakeholders of their respective CBCEs selling their own coffee brands. The CN-SE initiative established a PCAi Network Operations Center enabled by Starlink in Sagada, Mountain Province and engaged 2 pilot CBCEs and their farmer stakeholders to participate in developing the IoT system. The 2 CBCEs are the Ifugao Kape Roastery serving indigenous coffee farmers in Lagawe, Ifugao and Kasibu Coffee Growers Association (KCGA) serving indigenous coffee farmers in Kabisu, Nueva Vizcaya. The CN-SE initiative developed a digital “roasting machine bookkeeper model” that generates real-time operational data and provides automated feedback reports via a LoRa-based network which is useful even in remote areas with poor connectivity. While the CN-SE initiative engaged the 2 pilot CBCEs, the IoT system, as of project end, has so far been deployed in Ifugao, and is expected to be used by the CBCE and farmers during the processing of coffee for the coming harvest season. Plans for deploying the same in Kasibu is scheduled for November 2024. PCAi has included the pursuit of the piloting and replication of the CN-SE model building initiative in its annual and strategic plans towards mainstreaming such as part of the farmer-centered coffee subsector development plans in the Philippines as a whole.

### ***Evolving CN-SE Model Supporting Agro-eco-cultural Tourism (China)***

Sources for Action (SFA) in China developed and piloted the deployment of a community-centered virtual knowledge sharing platform called “Origin of Food Talks,” that enables farmers, youth and the ethnic people in the Meide Village in Dong Prefecture, Guizhou Province to document, preserve and promote their indigenous knowledge, food production practices, farming methods and cultural traditions that have sustained their way of life across generations. This was complemented by the creation and deployment of a virtual app that is accessible to the public through WeChat, where the villagers could widely share knowledge products, plan and promote cultural events and facilitate marketing of their products to potential consumers supportive of their efforts to promote their cultural heritage and agro-eco-cultural tourism. The knowledge sharing platform and virtual app are hosted by Yunshang Granary, a homegrown social enterprise in Meide Dong Village, whose cultural heritage promotion and agro-eco-cultural tourism initiatives have been held up as a model for ethnic communities in China’s autonomous regions. Given that the public infrastructure in China effectively provides internet connectivity even in remote villages, the CN-SE initiative was focused on developing the capability of the pilot ethnic community to create digital resources and use the connectivity in ways that would enhance the promotion of their cultural heritage while also contributing to boosting their social enterprise-led agri-eco-cultural tourism initiatives for local economic development. The SE-CN initiative is in the process of being replicated in the Queniao Village, Qiandongnan Miao Prefecture in Guizhou Province.

## ***Challenges in implementation***

The initiatives faced several challenges during implementation. Technical challenges included digital literacy barriers, language barriers, and technology adoption issues. Operational challenges encompassed integration with existing social enterprise systems, ensuring consistent community participation, maintaining sustainable financing and other resources, and addressing ongoing capacity-building needs.

The four evolving models identified several key areas for further development. Technical advancement will entail infrastructure improvement, enhanced user interfaces, and integration of emerging technologies. Organizational development necessitates strengthening community ownership and enhancing capacities and partnerships, while financial sustainability will require continued diversification of revenue streams and development of value-added services.

The CN-SE model building initiative has demonstrated that community networks that are embedded in social enterprise ecosystems can provide a pathway towards addressing the digital divide in ways that are directly linked to sustainable local economic development. This is made more significant by the existence of policy environments that have yet to recognize the value of community networks and community centered connectivity initiatives. Pursuing CN-SE model building initiatives should therefore be complemented with the pursuit of policy and regulatory work to advocate supportive frameworks, inclusive policies and piloting opportunities for government to support community-centered connectivity side by side with social entrepreneurship.

These themes are explored in more detail in the succeeding section.

## ***A Closer Look at Relevant Dimensions of the Evolving CN-SE Models***

### ***Technical Dimension***

Each model developed unique technical solutions based on their local contexts. FACE employed cellular router systems linked to a major mobile operator network with online/offline capability to facilitate the connection and coordination of women artisan cooperatives in four communities with stakeholders in the crafts value chain. SFA in China leveraged existing national telecommunications infrastructure, developing a knowledge sharing platform and a WeChat-based application focused on content sharing and knowledge management. In the Philippines, PRRM deployed Starlink setups and Piso Wifi stations principally for the organic agriculture stakeholders and extending to the community as a whole. PCAi integrated IoT/ICT with Arduino and LoRaWAN technology integrated with the coffee roasting equipment of community-based coffee enterprises.

Aside from the technical infrastructure provided, the initiatives also enabled remote, online communication means through WhatsApp (for FACE) and social media platforms like Facebook (for PRRM). Such platforms maintain interaction and learning exchange among key stakeholders of the communities and potential partners. To store the content and information coming from different sources, SFA and PCAi use cloud services.

### ***Policy and Regulatory Environment Dimension***

The regulatory environment significantly influenced each model's implementation. China maintains strict control over ICT infrastructure, but internet access is not a problem even in remote communities in the country. So, the CN-SE intervention has been geared towards building the capacity of stakeholders, particularly ethnic minorities in China's autonomous region to use the connectivity in a meaningful and useful way.

Bangladesh requires ISP licensing through their Bangladesh Telecommunication Regulatory Commission (BTRC) and focuses on commercial ISPs and operators, with ongoing advocacy efforts to tailor licensing and supportive regulations for CNs. The CN-SE initiative's connectivity in this context was linked to an existing mobile operator network. But there are measures in place to support the development of small connectivity initiatives and community networks like the provision of a Universal Service Fund and permitting the use of unlicensed spectrum for Wifi (2.4 GHz and 5GHz). Exploring how these measures could potentially enable further development and replication of the CN-SE initiative is a worthwhile agenda in a succeeding phase of model building CN-SEs.

The Philippines faces very restrictive and challenging policy and operational frameworks including the requirement for Congressional franchise for ISPs. Initiatives are being pursued to promote inclusive policies that support community-based initiatives such as a bill called Konektadong Pinoy or Open Access in Data Transmission Act, currently being deliberated in the Philippine Senate. There is also a proposed Poverty Reduction through Social Entrepreneurship (PRESENT) Act, which could potentially recognize and support CNs as social enterprises. Amid this difficult regulatory environment, both CN-SE initiatives needed to access connectivity through existing ISPs, with the Starlink system offering the better option for the remote locations of the initiatives.

### ***People, Organization and Partnerships Dimension***

The success of all four CN-SE initiatives were anchored on the leadership of social enterprise resource institutions (PRRM and PCAi in the Philippines; SFA in China; FACE in Bangladesh) working with their existing partners among intermediary social enterprises (Prokritee in Bangladesh, Vizcaya Fresh! Inc and Bote Central in the Philippines), and community-based social enterprises (Yunshang Granary in China; Kayapa Organic Producers' Association, Ifugao Kape Roastery and Kasibu Coffee Growers Association in the Philippines) operating in various value chains and subsectors (crafts, organic vegetables, coffee and agro-eco-cultural tourism). All pursued multi-stakeholder partnerships and engagements with relevant government bodies, academic institutions and private sector entities.

Strong community-based social enterprises and organizations evolving towards becoming social enterprises (particularly the women artisan groups being evolved into cooperatives in Bangladesh) served as anchors for the CN-SE initiatives, with youth involvement playing a crucial role in ensuring technical support and sustainability. The need for extensive capacity building in digital literacy emerged as a common requirement across all models.

Community engagement with marginalized sectors or groups emerged as a defining feature across all CN-SE initiatives. The CN-SE initiative focused on engaging four artisan producer communities in Ukhiya, Cox's Bazaar: Machkata Nari Uddyokta Atto-nirbhorshil Shomiti, Hatirghona Community; Nil Akash Atto-nirbhorshil Nari dol, Shonarpara community; Purbo-para Moyna Dol, Balu Khali community; and Mashkariya Pepe Atto-nirbhorshil Nari Dol, Follyapara community. Smallholder

farmers in two indigenous communities engaged in the production and marketing of rice and food were engaged in China: Meide Village and Queniaio Village located at Qiandongnan Miao and Dong Prefecture, Guizhou Province. In the Philippines, organic vegetable farmers from the town of Kayapa and coffee farmers in the municipalities of Lagawe, Ifugao and Kasibu, Nueva Vizcaya were engaged.

All initiatives also gave importance to the role of women. FACE particularly involved women artisan communities as creative artists, SFA developed content to highlight the role of women in their communities and in cultural preservation, PRRM involved women smallholder farmers, and PCAi engaged women coffee farmers and employees of CBCEs.

### ***Financial Dimension***

The main financial investment for supporting the implementation of the 4 CN-SE initiatives came from a grant amounting to USD150,000 from the Asia Pacific Network Information Center (APNIC) Foundation through the Information Society Innovation Fund (ISIF). Of this, USD25,000 was deployed directly to each partner for their respective CN-SE model building initiatives. USD25,000 was managed by ISEA for capacity building of partners and stakeholders and another USD25,000 was used by ISEA for regional project management, coordination and technical support.

Cost structures covered by the USD25,000 deployed for each of the CN-SE initiatives encompassed infrastructure investment, maintenance and operations, capacity building, and marketing and distribution expenses.

Additional support for the social enterprise development aspect of the model building initiative was provided or generated by the partner social enterprise resource institutions and social enterprises, particularly in the areas of product development and organizational development.

In Bangladesh, new and increased revenue streams were observed most dramatically among the participating women artisans in Cox's Bazaar in Shonapara (2.5 times increase over a period of 5 months) and Hatirghona (7 times increase over a period of 5 months).

In the Philippines, the Kayapa Organic Producers' Association generated a new income stream by retailing internet services to students and villagers the amount of which exceeded the monthly payment for subscription for the CN-SE's internet access. Cost savings were also noted resulting from the reduction of physical travel and face to face coordination among and between farmers, KOPA and Vizcaya Fresh! Inc as they undertook farm planning, production and marketing activities, although such were not monitored during the period of implementation.

For the CN-SE initiatives in the coffee value chain in the Philippines, it is much too early to expect any cost savings and revenue streams from more effective and efficient operations and decision making by the Philippine Coffee Alliance, the community-based coffee enterprises and their farmer stakeholders. It is also much too early to expect new and increased income streams for the Yunshang Granary, the farmers and villagers in Meide Village that would result from the marketing of products and enhanced agro-ecocultural tourism activities that would be generated over time by the virtual app.

Even as they are at various stages of development, each of the lead social enterprise resource institutions and social enterprises are enthusiastic in defining a combination of potential revenue streams and sources of cost savings that indicate many opportunities for ensuring financial sustainability of all the CN-SE models. This is in addition to the additional income streams that



farmers, women and villagers would have generate from their access to the internet and being enabled to use it in meaningful ways.

Social enterprise resource institutions and social enterprise partners from the four CN-SE initiatives see the value of covering the operating costs of maintaining the CN-SE infrastructure they are hosting after the project time frame. Vizcaya Fresh and KOPA in the organic vegetable value chain in Nueva Nizcaya, Philippines; Yunshang Granary engaged in the agro-eco-cultural tourism initiative in Meide Village, China; and the newly formed artisan cooperatives in the 4 crafts communities in Cox 's Bazaar; and PCAi and CBCEs have expressed a willingness to cover these costs from a combination of the following:

- expected cost savings (facilitated by reductions in travel costs and face to face coordination and training activities, resulting from more efficient operations and more effective decision making)
- revenues from increased sales of existing products or services that result from greater access to digital sales and e-commerce platforms (organic vegetables, coffee, food and other agricultural products, roasting and processing, bed and breakfast, artisan crafts and cultural products, tickets for cultural events and access to agri-eco-cultural tourism sites, fees for training and education services)
- revenue streams from new services including retailing of internet services as exemplified by the Piso Wi-Fi; service fees and training and consulting fees to enable internet access, access to virtual apps and platforms, creation of local content, management and maintenance of CN infrastructure
- grants from government and resource institutions that support digital transformation initiatives of cooperatives and social enterprises serving marginalized sectors and communities

### ***Social Impact Dimension***

While it is too early to define the social impact brought about by the four CN-SE initiatives, we can observe some stakeholder-based benefits and indications of social outcomes directly resulting from providing services to enable the marginalized stakeholders to have meaningful connectivity (what is referred to in social enterprise literature as social inclusion services) and services to enable the community-based social enterprises to manage the CN-SE initiatives beyond the project (what is referred to in social enterprise literature as transformational services).

Generally, the CN-SE initiatives all provided different capacity-building services tailored to ensure the social inclusion and transformation of marginalized stakeholders in social enterprise-led value chains and economic subsectors to transition towards participating and reaping benefits in a digital economy:

- FACE provided trainings on digital literacy, e-commerce and online marketplace, cybersecurity and online safety to marginalized women artisans towards their meaningful use of the internet to communicate and coordinate with product designers, quality checkers and marketing channels
- SFA conducted capacity-building activities for youth and farmers on communication techniques and development of local content for digital knowledge and market platforms supporting the preservation of the cultural heritage of the Dong ethnic communities and supporting agro-eco-cultural tourism

- PRRM with the help of its partners provided trainings to the Kayapa Organic Producers' Association on digital literacy, the use of digital platforms and community network management and maintenance
- PCAi introduced the integration of an IoT system to their AI-enabled coffee roasting machines among its pilot community-based coffee enterprises and their farmer stakeholders to generate useful data that could contribute to their operational efficiency and decision making.

The stakeholder-based benefits and indications of social outcomes that have been manifested by the CN-SE initiatives so far are:

- Improved digital literacy and access to the internet and internet platforms by organic vegetable farmers (Kayapa, Philippines), women artisans (Cox's Bazaar, Bangladesh) and indigenous farmers and villagers (Meide Village, China) and the community-based social enterprises serving them (KOPA, cooperatives of women artisans, Yunshang Granary)
- More efficient and effective participation by organic vegetable farmers and women artisans as stakeholders in their respective social enterprise-led value chains resulting to improved product quality and reduced operating costs (Kayapa, Philippines and Cox's Bazaar, Bangladesh)
- Improved access to markets and marketing tools/platforms by organic vegetable farmers and women artisans (Kayapa, Philippines and Cox's Bazaar, Bangladesh)
- Significant increase in incomes among artisan women engaged in a social enterprise-led crafts value chain (Bangladesh)
- Creation of a new revenue stream from the retailing of internet services to students and villagers (KOPA, Philippines)
- Improved community capacity to preserve and promote the cultural heritage of the Dong people (Meide Village, China)
- Improved capacity to reach external customers and access markets for the agricultural products, education services, bed and breakfast and other agro-eco-cultural tourism products and services of the Meide villagers and their social enterprises
- Enhanced participation and capacities of women as stakeholders in the digital economy
- Enhanced participation and capacities of youth as stakeholders in the digital economy

Given these initial benefits and outcomes, and assuming the CN-SE initiatives are sustained, the key result areas that these CN-SE models may deliver in terms of social impact in the long term may be summarized in the following areas:

- Increased participation of marginalized sectors and communities in the digital economy
- Improvement in the economic position and conditions of community stakeholders
- More effective preservation of cultural integrity, identity and heritage
- Increased levels and capacities for inclusive human development
- Empowerment of marginalized communities to govern and manage digital resources for meaningful connectivity

These could be starting points for evolving a framework for measuring the impact of CN-SE initiatives that can be aided by tools such as development indexing that is being used to facilitate the

measurement of complex outcomes of social enterprises as a whole. This is an agenda that can be pursued in a succeeding phase of the CN-SE model building project.

The main challenge in terms of social impact is one related to optimizing the CN-SE intervention to enhance and scale up impact among various segments of intended stakeholders (as exemplified by the many intended stakeholders in the agro-eco-cultural tourism CN-SE initiative in China) and beyond the current stakeholders of the social enterprise in specific value chains (as exemplified by the potential for the CN-SE initiative not only to benefit the organic vegetable farmers but also students and villagers in the case of the CB-SE initiative embedded in the organic vegetable value chain in the Philippines). This is an agenda that can be pursued in a succeeding phase of the CN-SE model building project.

### ***Sustainability Dimension***

Given the nature of the CN-SE initiatives that were pursued as being embedded and led by social enterprise resource institutions and social enterprises providing or supporting the provision of sustainable livelihoods in specific economic subsectors or value chains, the CN interventions were from the beginning structured to assist how these socio-economic endeavors could be expanded in new areas using internet connectivity (as was the case in developing new supplier craft communities in Bangladesh) or enhancing the effectiveness and efficiency of agricultural value chain or economic subsector operations (as in the case of the organic vegetable value chain and the economic subsectors of coffee and agro-eco-cultural tourism (in the case of the Philippines and China). So as has been expressed by the lead social enterprise resource institutions and social enterprises, there is a willingness to define and pursue sustainability strategies as they are experiencing actual benefits and various expressions of meaningful connectivity. Prospects of financial sustainability beyond project time frames has already been tackled under the financial dimension. On the short term, the absorption of the operating cost of maintaining the CN infrastructure and paying the fees for internet connectivity offered by commercial or state-owned ISPs has been indicated to be feasible given existing and new income streams by the host social enterprises in the case of the CN-SE intervention in the organic vegetable value chain in the Philippines as well as the CN-SE intervention in the agro-eco-cultural tourism subsector in China.

In addition to developing diverse income streams and services, expanding partnerships and serving more community stakeholders, sustainability strategies of CN-SE initiatives have other aspects that are worth noting, considering that they are embedded in social enterprise ecosystems pursuing sustainable local economic development. From the 4 CN-SE initiatives, some of the themes that have been raised as important in evolving sustainability strategies are pursuing local ownership, inclusive governance structures, cultural preservation and knowledge transfer efforts to ensure buy in and local capacities to manage the community network infrastructure and knowledge resources. Renewable energy solutions to provide the electricity in remote villages and regular maintenance protocols and modular system design were identified as important to address technical sustainability.

## ***Conclusions and Recommendations***

The diversity of approaches and expressions of meaningful connectivity across the four CN-SE models show that while they share common attributes, implementation must be adapted to local contexts and needs. Based on the results of the project, there is enough evidence of the significance and usefulness of pursuing CN-SE initiatives as a pathway to bridge the digital divide.

As the four model building initiatives reached different stages of development, a succeeding phase to support them for greater impact and sustainability is recommended.

Optimization and scaling up impact would be an interesting agenda for a succeeding phase of a CN-SE model building intervention in the organic vegetable value chain in the Philippines and the agri-eco-cultural tourism subsector in China. Optimizing and scaling up impact means more focused interventions for the organic vegetable farmers, KOPA and Vizcaya Fresh to fully operationalize utilization of internet connectivity to make their farm planning, production and marketing operations more effective and efficient and monitoring how such would impact on productivity and incomes at various levels. Optimizing and scaling up impact means more focused interventions for the various community stakeholders in Meide Village to effectively use and benefit from the knowledge sharing platform and the virtual app supporting their agri-eco-cultural tourism initiatives. It could also mean pursuing the CN-SE intervention beyond the areas served (e.g. beyond Kayapa and Meide) or the current stakeholders they serve. In this respect, both PRRM and Vizcaya Fresh as well as SFA may also explore possibilities of fully developing the provision of meaningful connectivity either as a distinct service to communities covered (e.g. providing access through the Piso Wi-Fi and providing training and consulting services to enable meaningful connectivity) or as a distinct social enterprise (evolving the current “Origin of Food Talks” app to become a social enterprise platform for multiple communities engaged in agro-eco-cultural tourism).

In the case of Bangladesh, strengthening the partnership of the new supplier communities to intermediary social enterprises engaged in product development and marketing is a hurdle that the CN-SE initiative needs to address to ensure sustainability. The opportunities offered by measures such as the Universal Service Fund and permitting the use of unlicensed spectrum for Wi-Fi (2.4 GHz and 5GHz) would be interesting to explore in partnership with the Fair Trade movement that is strong in the crafts subsector in Bangladesh. Exploring this would be an interesting agenda for a next phase of the CN-SE model building initiative.

In the case of the CN-SE initiative in the coffee value chain, it is important for PCAi to pursue the deployment of the IOT-system with the pilot CBCEs, in the process testing its relevance and significance in bringing about benefits and outcomes among coffee farmers. This is an unfinished agenda that needs to be pursued in a succeeding phase of the CN-SE model building initiative.

The results of the project also show the value for pursuing CN-SE initiatives in other value chains and economic subsectors or in similar value chains and economic subsectors in other areas and countries. The most important requirements for the pursuit of these CN-SE initiatives are (1) the presence and willingness of social enterprise resource institutions and their social enterprise partners on the ground to pursue meaningful connectivity as part of their sustainable livelihood development interventions; and (2) establishing that the target stakeholders and communities face a problem or need in terms of internet access that is not being met by commercial ISPs or need to overcome systemic barriers to become meaningfully connected (3) generating adequate resources from local, regional or global resource institutions willing to provide adequate resources to pursue CN-SE model building initiatives.



As these CN-SE models continue to evolve, their potential to bridge the digital divide and ensure meaningful connectivity while contributing to social enterprise and local economic development will become increasingly evident. It would be interesting to continue exploring how these CN-SE initiatives would fully evolve as part of social enterprise ecosystems. The current project provides indications that it is possible for them to evolve into full-fledged social enterprises or become part of the range of services offered by social enterprises.

The development of social impact measures and giving attention to evolving various types of sustainability strategies are important aspects to be pursued in succeeding phases of the CN-SE model building initiative. As an important agenda being tackled by practitioners, resource institutions and policy makers of community networks (CNs) and community centered connectivity initiatives (CCCI), this is a distinct contribution that this CN-SE model building initiative can make, as it carves a complementary pathway to connecting the unconnected and bridging the digital divide.

It is also important that the pursuit of this CN-SE model building initiative be complemented by advocacy efforts and engagements with government towards creating a more favorable environment and ecosystem to enable scaling up of impact of CN-SE initiatives on one hand and developing CNs and CCCIs as a segment of social enterprises in the digital industry.



## MODEL BUILDING OF COMMUNITY NETWORKS linked to Social Enterprise and Sustainable Local Economic Development

### Implementing Partners

