



Identifying Synergies Between Community Networks & Community Radios in Promoting Public Wi-Fi Access in Asia Pacific Countries

23 community network and community radio operators participate in CNX 2018

Stakeholders in Asia Pacific find synergies to work together

Community network operators from 10 countries travel to rural India

An overview of an Internet-in-a-box solution called Zero Connect

Community Network Exchange 2018

Identifying Synergies Between Community Networks & Community Radios in Promoting Public Wi-Fi Access in Asia Pacific Countries

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Published & distributed by Digital Empowerment Foundation

You can read the online copy at www.defindia.org/publication-2

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MESSAGE FROM DEF

This year, we finally reached the halfway mark. The International Telecommunications Union (ITU) put the number of people using the Internet by the end of 2018 at 3.9 billion, out of a global population of 7 billion. This means 51.2 per cent of the world population with access to the Internet. However, this means that there are 3.1 billion people who are yet to be connected. If it took the world 26 years to get half its population online, then will it take another 25 years to get the remaining online?

As the world is moving towards more and more access to information and services online, the excluded individuals are being excluded even further—almost to the level of being disenfranchised. In such a scenario, the cost of accessing any information or service online for them is much higher than a digital citizen. Therefore, it might not be the best approach to depend on telcos or their model of business alone to connect the remaining 3.5 billion people.

We need to look at an alternative methodology to connect the rest of the world. We need innovation in technology, business plans and methodology. We need relaxed policies. We need community networks.

OSAMA MANZAR

Founder-Director
Digital Empowerment Foundation



MESSAGE FROM ISOC

It's promising to see the CNXAPAC initiative, which we launched in 2017, is growing from strength to strength. For the 2018 edition we focused on deeper knowledge sharing with an expanded range of stakeholders, including participants from other regions of the world.

The level of discussions, and the thoughts and ideas that were put forward indicate that CNXAPAC provides an important forum through which Community Network practitioners and promoters are able to engage in useful dialogue. Whilst not all Community Network deployments are the same, they all share the same desire to connect the unconnected, and to help empower the community through the Internet, and the digital services that it enables.

Our work in South Asia in particular has always focused on connecting underserved communities using readily available economical network equipment – and not specialised and expensive equipment. We also place great emphasis on the local community being trained to manage, operate and maintain the network. Our efforts have led to hundreds of networks being inspired and deployed in the sub-region providing access to tens of thousands of people.

This year, we also piloted the Internet Society's Community Network Champions project with great success. The idea was to bring people from other regions of the world to learn, share experiences and immerse themselves over a 10-day period in the community network projects that we have been doing in India since 2010. Over the years we have built a great deal of knowledge and expertise in community networks in India and South Asia, and the Community Network Champions project is one way through which we can share our knowledge and expertise with the rest of the world.

We look forward to the Community Network Champions – who came from countries in Africa, the Caribbean, Central Asia, the Middle East, and the Pacific Islands - to initiate projects and initiatives in their home countries so that their communities can also benefit from the power of the Internet, and the socio-economic empowerment it can enable.

RAJNESH SINGH

Regional Director (Asia-Pacific Regional Bureau)
Internet Society



INTRODUCTION

ACROSS THE
WORLD,
THERE ARE
ABOUT MORE
THAN 100
COMMUNITY
NETWORK
MODELS

Across the world, there are about more than 100 community network models that act as a complementary bottom-up approach, based on community-driven infrastructure development to connectivity, and challenge the classic top-down operator-driven paradigm. Some of these networks are located in Latin America (Argentina, Brazil, Mexico), Africa (South Africa, Kenya, Ghana, Congo), Asia Pacific (India, Nepal, Pakistan, Indonesia, Australia, Afghanistan, etc.), North America (Canada and US), Europe (Germany, Austria, Hungary, Spain, Greece, Sweden and Croatia). These community networks provide Internet services in some of the remotest regions of the world.

Then there are community radio stations. It is estimated that there are 4,000 community radio stations worldwide, working in rural and remote regions of the country. These community radio stations' strength lies in understanding local community, the local language, the local dialect, the local cultural content and the local problems. This vast knowledge is also essential for community network operators, so that they can contextualise the Internet for the local community to ensure maximum relevance of the technology.

While community radio stations bring with them knowledge of the local community, community network operators hold technical expertise in setting up towers, resources to manage the local content and services and legal knowledge on radio frequency allocation. This makes the partnership between the two essential for connecting the unconnected.

THERE
ARE 4,000
COMMUNITY
RADIO
STATIONS
WORLDWIDE

In 2017, Digital Empowerment Foundation (DEF) and the Internet Society (ISOC), with support from Information Society Innovation Fund (ISIF Asia) and Association for Progressive Communications (APC), organised the first Community Network Exchange (CNX) in New Delhi on September 20, 2018. The theme of the first Community Network Exchange (CNX) was 'Understanding the Social & Economic Sustainability Approaches of Community Networks in Asia Pacific'. The primary objective of the Summit was focused on understanding sustainable business models for community networks running in the Asia Pacific region. The summit had representation from more than 10 community network providers, community radio stations and practitioners from India, Bangladesh, Nepal, Myanmar, Thailand, Malaysia, Argentina, and South Africa. Together, they discussed possible ways of increasing prolifera-

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COMMUNITY,
COMMUNITY
NETWORK
OPERATORS
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A PLATFORM
FOR GLOBAL
COMMUNITY
RADIO STATIONS
AND COMMUNITY
NETWORK
PROVIDERS TO
EXCHANGE THEIR
KNOWLEDGE

tion of community networks in global rural, remote regions.

Taking forward recommendations from the first CNX, DEF and ISOC organised the second edition of CNX 2018 in New Delhi with support from ISIF Asia, Commonwealth of Learning (COL) and UNESCO New Delhi. This time the focus was on identifying synergies between community networks and community radios in promoting public Wi-Fi access in Asia Pacific countries.

The objectives of the second edition of CNX were clear. The participants wanted to:

- Map synergies between community radios and community networks
- Identify and discuss complementary roles of community networks and community radios
- Showcase best practices around infrastructure, content and user capacity building
- Demonstrate community network technology solutions for possible adoption
- Create a pool of barefoot network engineers with the help of community radio stations

In an effort to create a pool of barefoot network engineers with the help of community radio stations, CNX 2018 also became the launch pad for Community Network Champions (CNC). The CNC was envisioned as a 10-day fellowship programme for community radio stations and community network providers across the world to exchange knowledge with each other, both theoretically and practically. For this purpose, the participants travelled to a Wireless for Communities (W4C) project site, supported by DEF and ISOC, to study and understand the frugal model of community networks adopted by the organisation to increase proliferation of Internet access in rural and remote locations of India.





COMMUNITY NETWORK EXPERTS

14 community network operators from 10 countries and 9 community radio operators from 5 Indian states participated in Community Network Exchange 2018

RONEL VINCENT VISTAL

Philippines
Village Base Station Project

HARRY SURJADI

Indonesia
Global Forest Watch
Tech Fellow 2018

AHMED ALAALI

Bahrain
The Hive

ISABEK ASANBAEV

Kyrgyzstan
Kyrgyz Chapter of Internet Society

REYNOLD GUERRIER

Haiti
Groupe de Support en Informatique
et en Statistiques (GSIS)

IRINE CHEPNGETICH MISOI

Kenya
Catholic University of
Eastern Africa

PAUL HENRY YAUKO

Vanuatu
Prime Minister's Office,
Republic of Vanuatu

ERZHIGIT IMAMOV

Kyrgyzstan
Kyrgyz Chapter of Internet Society

NICOLAS PACE

Argentina
AlterMundi

HEMANT BABU

India
Nomad Communication

DHINESH PANDIAN

India
GeoMeo Informatics

SHUBRANSHU CHOUDHARY

India
CGNet Swara

GIRISH ADHIKARI

Nepal
Nepal Wireless

SARBANI BANERJEE BELUR

India
IIT - Bombay

COMMUNITY RADIO EXPERTS

AJAY MISHRA

Lalitpur, Uttar Pradesh,
Lalit Lokvani

RAM RAGHUWANSHI

Vidisha, Madhya Pradesh,
Radio Mann

NISHANT AMBHORE

Wardha, Maharashtra,
Radio MGIRI

SACHIN MENKUDALE

Satara, Maharashtra,
Manndeshi Tarang Vahini

DURLOB BARMAN

Guwahati, Assam,
Radio Luit

MADHU SUDAN PANDIT

Siwan, Bihar,
Radio Snehi

RAHUL PANDITRAO THAKARE

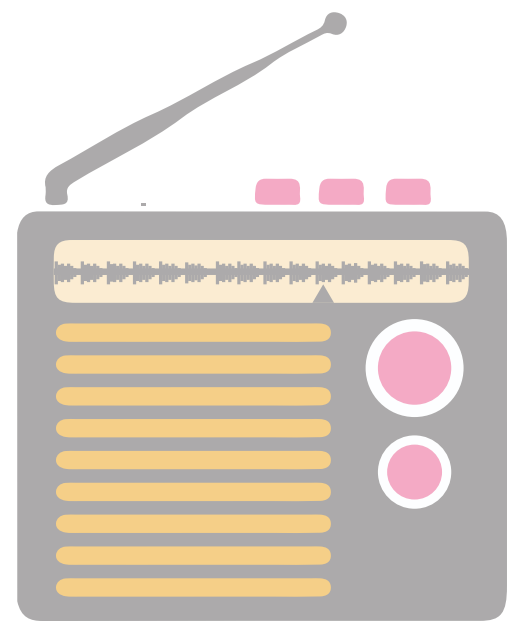
Manmad, Maharashtra,
Panzarawani

SANJAY CHANDEKAR

Pune, Maharashtra,
Radio FTII

SANDIP DESHMUKH

Manmad, Maharashtra,
Swaranant CRS





Community Network Champions brainstorming ideas



CONNECTING TO BUILD A CONNECTED WORLD

Summarised below is a report on Community Network Exchange 2018 organised on October 31, 2018

In the last 25 years, half the world has been connected to the Internet and the almost infinite opportunities it has to offer. Most of these, among the 3.5 billion connected individuals of the world, are people who are largely economically empowered, literate and reside in urban or accessible areas. However, there is also half the world that is yet to get online and access what the Internet has to offer them.

The biggest barrier to widespread connectivity is the high cost of infrastructure. With most telecom companies unwilling or unable to build infrastructure in far flung and rural areas, large swathes of the world have remained in media darkness. Evidently, most of those who are excluded from digital ecosystems are people who are largely at the bottom of the pyramid and reside in rural or inaccessible areas. They are people who have not been connected by the mainstream Internet Service Providers (ISP), and people who may have to wait a long time to be connected.

So who will take the responsibility of connecting them? It has to be the community themselves.

The second edition of the CNX was organised by DEF with support from the Internet Society (ISOC) and UNESCO. Regional Director (Asia-Pacific Regional Bureau) at ISOC, Rajnesh Singh, introduced community network operators present at the event from 10 countries, including India, who had come to exchange their learnings with each other. The event also saw 12 community radio station managers, all from India.

“What we are here to discuss is very much at the heart of UNESCO,” said Adviser for Communication and Information for South Asia at UNESCO Al-Amin Yusuph.

In its second edition, CNX focused on ‘Synergies Between Community Networks and Community Radios in Promoting Public Wi-Fi Access in Asia Pacific’, and saw representation from 10 countries, including Haiti, Argentina, Bahrain, Kyrgyzstan, Nepal, Vanuata, Philippines, Kenya, Indonesia and India.

Celebrating the year’s theme and advocating for decentralised

**HALF THE WORLD
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HAS TO OFFER
THEM**

SYNERGIES BETWEEN COMMUNITY NETWORKS AND COMMUNITY RADIOS IN PROMOTING PUBLIC WI-FI ACCESS IN ASIA PACIFIC

OVER THE YEARS, COMMUNITY NETWORK PROVIDERS HAVE PROVED TO BE GREAT ENABLERS FOR BRIDGING THE DIGITAL DIVIDE

access to the Internet, Executive Director at Ideosync Media Combine Ramakrishnan Nagarajan noted, “I am glad to see the convergence of these two sectors to share ideas to empower people. We’re all here today because we believe access to communication and connectivity methodologies should be promoted.”

Over the years, community network providers have proved to be great enablers for bridging the digital divide. Some of these networks are located in Latin America, Africa, Asia Pacific, Europe and even the US and Canada. The convergence of the community network and community radio players was thus to map out synergies between community radios and community networks; identify and discuss their role in creating public Wi-Fi access spaces; create barefoot community network engineers with the help of community radio stations; showcase best practices around infrastructure, content & user capacity building; and demonstrate community network technology solutions that can be adopted by community radio operators.

During the course of the day-long exchange, the participants threw some light on the cultural, social and economic scenarios in their respective countries, and went on to talk about how their technological solution for connectivity was helping the community members access the Internet. The participants also discussed their expectations for access in general and for community networks in particular. These expectations were then matched with recommendations, which looked into the areas of policies, pricing, ownership and model of operation.

One of the points that often made its way into the discussion was the understanding that the remaining unconnected population of the world is not lucrative enough for the private Internet Service Providers (ISP), therefore, the government needs to relax policies to make room for community network operators to leverage unlicensed spectrum and even TV white spaces. The community radio operators saw relevance in this, especially since they reach out to people at the last mile who are largely living in media darkness, if not for community radio. In the last six to seven years, there has been increasing sense that community radios need to leverage digital media to reach out to a larger number people. The physical infrastructure, remote wireless reach and available human resource at various community radio stations across Asia Pacific was seen as a pool of opportunities, waiting to be leveraged.

Brainstorming on ideas, community radio operators felt that there needs to be more engagement between them and community network operators, as both sectors have strengths that can empower each other. While one can establish infrastruc-

PARTICIPANTS PROPOSED THE 4P MODEL FOR TRULY LAST MILE REACH IN INDIA AND OTHER DEVELOPING COUNTRIES

ture for connectivity, the other can provide a platform for exchange of localised information. Together, the two can even create Internet-based radios. Hence, an approach of training of trainers could go a long way in identifying synergies between the two, and implementing proposed solutions.

Addressing the challenges that the Bharat Net* has faced in India so far when it comes to project delays and ineffective implementation, the participants proposed the idea of Public Private Panchayat Partnership Model or the 4P model for truly last mile reach in India and other developing countries with a provision for village councils.

The same issues apply to a country like Kyrgyzstan where connectivity is low given the fact that over 90 per cent of the country's land is covered with mountains, making laying of optical fibre difficult for the public or private ISPs. This can be addressed if the government were to relax regulations and allow community members to establish their own networks.

Further, the participants discussed that the mere availability of infrastructure cannot empower the communities, unless they also become active producers of localised content for the Internet. An Internet with everything in English is not useful for a community that does not understand or is not fluent in English.

AN INTERNET WITH EVERYTHING IN ENGLISH IS NOT MUCH USEFUL FOR THE COMMUNITY MEMBERS

And the Internet is an empowering tool for potential content producers, as it allows people to share their knowledge without necessarily knowing the script of any language. The potential strength of localised audio-visual content was seen of great value for developing countries like India where literacy rates are low, and functional literacy even lower.

So far, there have been several cases around the world where passionate and innovative community members have been able to leverage varying technology, tools, regulations and socio-economic and cultural conditions to bring Internet connectivity to their people. However, these efforts are scattered around the globe, and mostly implemented in silos by community network operators.

In an effort to connect such efforts across the developing world and learn from each other, the ISOC and DEF organised a 10-day immersive training programme for Community Network Champions (CNC) from various regions, as a follow-up to CNX 2018.

**The National Optic Fibre Network (NOFN), later renamed 'Bharat Net', was launched in October 2011 as an ambitious initiative to connect all 250,000 gram panchayats of India to the internet. Read more about the status of the BharatNet project at <https://bit.ly/2LayEnH>*



TWITTER CHATTER

Snapshots of highlights on the microblogging site around #CNX2018



Subhashish Panigrahi @subhashishpanigrahi
Many women in indigenous communities [that we work with] can't step out of their houses after dark [to go near community hubs] so the access of the Internet for women is a big challenge. Dr. Sarbani Banerjee-Belur, Gram Marg, IIT Bombay. Pic 2: App interface
#CNX2018 #SwitchItOn

DEFindia @DEFindia
I. Ramakrishnan of @IdeosyncMedia says, #CNX2018 will help in forming forward steps in terms of standards, processes and models. f #CommunityNetworks & Radios SwitchItOn @internetsociety @ISIF_Asia

IdeosyncMediaCombine @ideosyncmedia
Dinesh Pandian from @savemomindia talks about #communitycentereddesign for their #maternalhealth-sensors at the #CNX2018 panel being chaired by @IdeosyncMedia Director N.Ramakrishnan #SwitchItOn

kuyarV @kuyarV
Thank you very much @DEFindia for the opportunity to share our humble project in the PH in a wider audience like #CNX2018. To more #CommunityNetworks & Radios one village at a time.

ISOC Asia-Pacific @isocasia
This year, our fellows from all over the world are working to amplify public wi-fi by building collaborations between #CommunityNetworks and #CommunityRadios. Pictures from their recent field trip to Guna, MP, India.
#CNX2018 #SwitchItOn @DEFindia @internetsociety #publicwifi

Ritu Srivastava @ritu_srivastava
#CNX2018 started with introduction on how community networks and community radios play role in bringing the last mile connectivity and content delivery @ISIF_Asia @internetsociety #CommunityNetworks #SwitchItOn

Rajnesh Singh @rajneshsingh
Proving that the unconnected can be connected - one village at a time. The success story that is Wireless4Communities - a joint project of @ISOCapac & @DEFindia changing people's lives since 2010
#CommunityNetworks #W4C #CNX2018 @internetsociety #netgov #switchiton

FEEDBACK

Participants share notes on #CNX2018

What did you like the most about CNX?

- Sharing of knowledge on different community network models
- The success stories from Kyrgyzstan
- Opportunity to network with wireless engineers
- Brainstorming on how to connect the unconnected
- Panel discussion on synergies, collaboration and road ahead

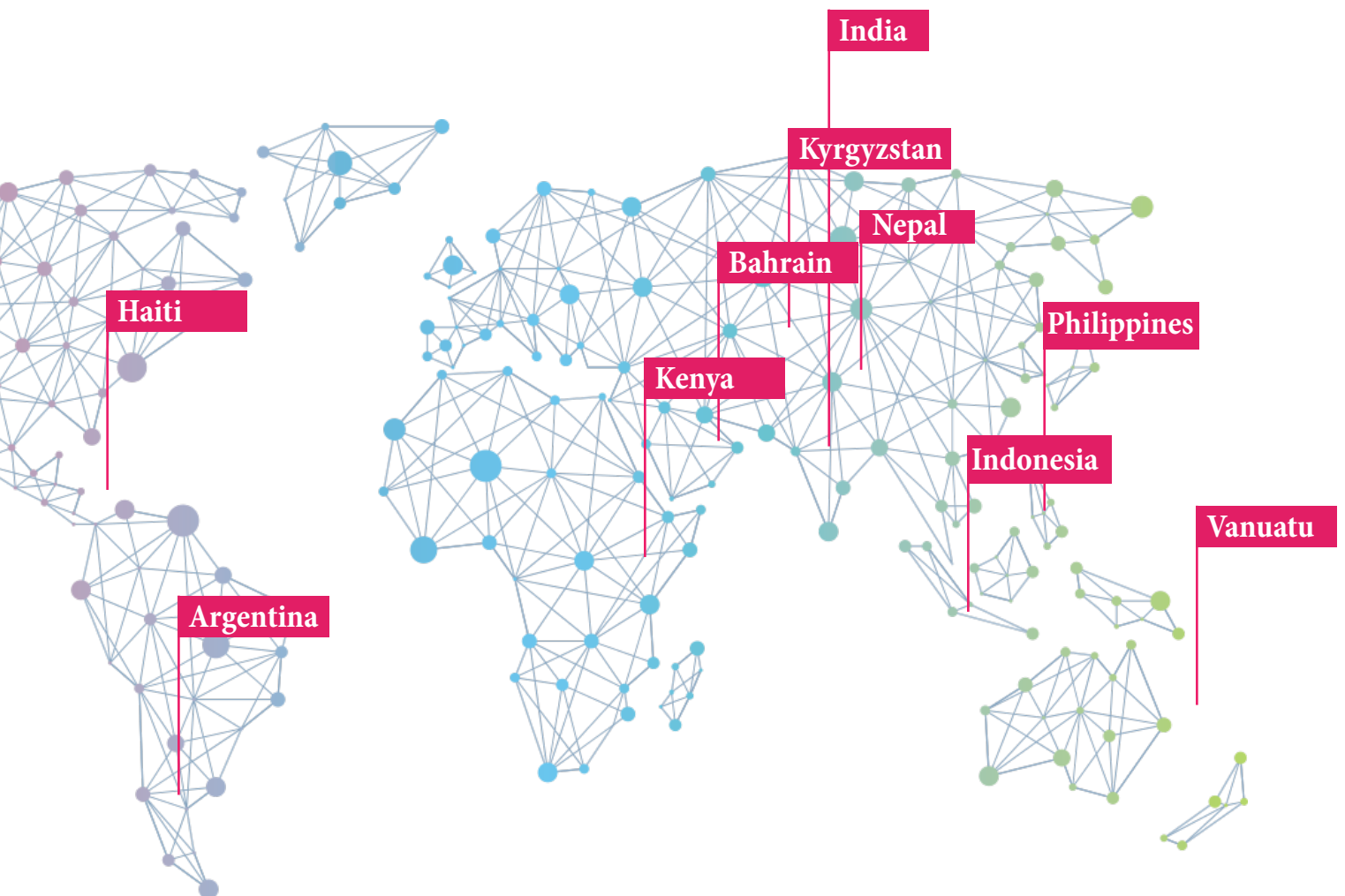
What can we do to make CNX 2019 even better?

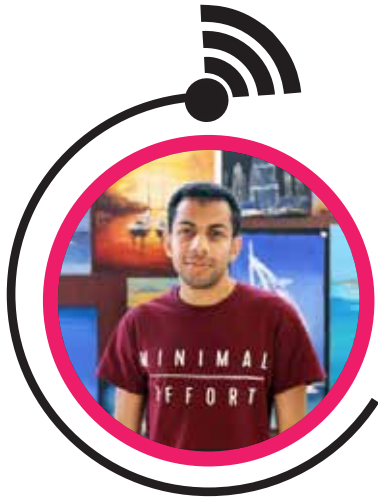
- Let's host the next CNX at a community network site
- An even bigger audience to include more success stories
- Establish a forum to take concrete implementation steps for the future
- More impact videos from India and abroad

CHAMPIONS

AND

THEIR EXPERIENCES





AHMED ALAALI (BAHRAIN)

Ahmed is the CEO of the The Hive, which is Bahrain's first technology hub focused on idea development and implementation of technology solutions. Primarily designed as a hacker-space to engage young people with sustainable and innovative robotics, it offers access to specialized tools and resources, both in the formal education sector and through a fun/discovery space that could contribute towards the growth of a technology influenced community in Bahrain. The Hive aims to work both at individual and organisational level and engage them with the maker movement through continuous mutually beneficial engagement in order to ensure the growth of the maker community in the nation.

DHINESH PANDIAN (INDIA)

Dhinesh is the co-founder of the Madurai-based start-up GeoMeo Informatics it provides tech-driven solutions to social and civic issues. The start-up has delivered many successful interventions for the Madurai Police to facilitate prevention and detection of crimes like burglary. However, one of its flagship products is GeoMesh – a self-healing wireless router with wide area coverage designed specifically for the rural areas to get connected with digital world. GeoMesh is designed as a high-speed cost-effective outdoor router with low power consumption and high gain antenna with multiple radios and multi-band support to provide stable connection over the mesh network. Being waterproof and dustproof it is resistant to adverse temperature conditions and provides a stable connection even in intense outdoor environments.



ERZHIGIT IMAMOV (KYRGYZSTAN)

Erzhigit is an engineer from Novopokrovka, a town 15 km from Bishkek, the capital of Kyrgyzstan. The country's mountainous terrain does not lend itself to seamless connectivity. When 4G was rolled out in Kyrgyzstan even if one had the modem device, the service provider could not guarantee signal in places like Novopokrovka. This spurred Erzhigit to create a device that boosted signals from the nearest 4G transmission tower. Following his early successes he started building his own antennas through his start-up. He then took his work into mountainous regions afflicted by poor signals and offered to set up their antennas at cost of production. The efforts have come full circle when the service provider, whose limitations led to the innovation, is working with Erzhigit to help the company extend its penetration into remote areas.



GIRISH ADHIKARI (NEPAL)

Girish is a trainer with Nepal Wireless a social enterprise that provides Internet access, electronic commerce, education, tele-medicine, environmental and agricultural services to a number of remote villages in Nepal, using wireless technologies. It was born informally in 2002 in Nangi village of Nepal by connecting it to the city of Pokhara using simple Wi-Fi devices and home built antennas. Initially its plan was to connect only six villages in a particular district. However, the demand for the wireless network came from many villages as a result of which the network was expanded to many villages in a span of over ten years and it is still growing. Now it has connected more than 160 villages of 15 districts of Nepal. The villages that are connected to the network get Internet and intranet services via servers in big cities like Kathmandu and Pokhara, where internet service providers are available.

IRINE CHEPNGETICH MISOI (KENYA)

Irine is an engineer and part-time lecturer at the Catholic University of Eastern Africa. She is also a member of the Kenyan Chapter of Internet Society as well as the Kenyan Chapter of AFCHIX. Working with AFCHIX led to her first interface with community networks. AFCHIX is a pan African organisation that promotes capacity building by encouraging more women to build careers in computing and is currently working to build community networks in four countries in Africa, namely Kenya, Morocco, Senegal and Namibia.



ISABEK ASANBAEV (KYRGYZSTAN)

Isabek is a project coordinator of the Kyrgyz Chapter of the Internet Society, managing the implementation of the chapter's projects which include a Community Network in Suusamyryn valley, IXP in Ferghana Valley and internet in a box for schools in the remote regions of Kyrgyzstan. The Kyrgyz Chapter of the Internet Society is committed to making the internet more accessible, eradicating the digital divide, and creating demand for the internet. He is also the coordinator of M-Report project of UNICEF Kyrgyzstan Country Office aimed at making the voices of youth heard in a meaningful way at the highest levels of decision-making via modern technologies, such as SMS and social networks.





PAUL HENRY YAUKO (VANUATU)

Paul Henry is Network Admin Officer with the Prime Minister's Office of the Government of Vanuatu. Vanuatu, being a small island nation with a volatile topography, presents substantial challenges for last mile connectivity. Paul Henry attended the training with the objective to learn more about how ICT tools could be adapted to his community back in Vanuatu to promote sustainability and economic growth.

REYNOLD GUERRIER (HAITI)

Reynold is the CEO of GSIS (Groupe de Support en Informatique et en Statistiques), a consulting firm which provides professional information services to NGOs, public, and the private sector in Haiti. He has been working to develop Internet facility in Haiti since 1995, when the first connection was installed there. Over the years he developed expertise in designing and managing complex ISP networks and also led the team deploying the first WiMAX broadband wireless with Multilink in 2008. Throughout his career, he has provided training to young network technicians. He has coached and mentored as a volunteer in the Nethope Academy Program launched after the January 2010 Earthquake to help unemployed young people to get work experience and certifications. Apart from this he has also served as the interim project manager of an e-governance project financed by IDB in 2010 and as the former President of AHTIC (Haitian Association for ICTs).



RONEL VINCENT VISTAL (PHILIPPINES)

Ronel is a Research Associate with the Village Base Station Project (VBTS) which operates in several provinces in the Philippines and works towards mapping possibilities to create local community networks (CNs). A government-funded project, VBTS aims to study the feasibility of deploying low-cost, low-power, compact GSM (2G) BTS that uses renewable solar power energy. The network is customised for small communities and managed locally by local government units and cooperatives. In one of the community network stations in Aurora, the project is also conducting an impact evaluation study of communities with first-time access to cellular communications, with the purpose to provide insights on socio-economic change, social and infrastructural needs, and policy recommendations.



COMMUNITY NETWORK CHAMPIONS' RURAL DIP

A brief note on the 10-day Community Network Champions' Programme and their week in rural India

As part of CNC, eight participants from Haiti, Bahrain, Nigeria, Kyrgyzstan, Philippines, Kenya and Indonesia traveled to Guna in Madhya Pradesh to immerse themselves in immersive training on deployment of wireless networks, its operations and management.

The rural India journey started on November 2, 2018, with the participants travelling by train from New Delhi to Gwalior, followed by a four-hour drive to Guna in Madhya Pradesh.

The fellowship was divided into three segments — the participants received training in understanding the relevance of wireless networks, understood the frugal model of community network adopted by DEF in Guna, and received hands-on training in assembling and deploying Internet in a Box, a solar-powered DIY solution designed and developed by DEF. The engaging and intensive training was led by Girish Adhikari of Nepal Wireless.

In these 10 days, the fellows not only learnt how DEF is using unlicensed spectrum and frugal technology to connect the unconnected (most recently through its DIY Internet in a Box solution), but also brainstormed on new ideas for connectivity, challenges of community networks and policy recommendations for connecting the rest (while navigating multiple hospitality and logistical challenges of staying in rural India).



**I LEARNED
A LOT ABOUT
BEST PRACTICES
AND ENGAGING
COMMUNITIES
IN NETWORK
ESTABLISHMENT
AS WELL AS ITS
MANAGEMENT**

The first five-days of the training were largely dedicated to a technical schedule, understanding wireless networks; various physical, data link and network layers. The technical schedule also looked at planning a network design, familiarising oneself with equipment and servers, and taking a problem solving approach to network establishment and troubleshooting techniques. The training also focused on documentation and monitoring tools and methods. The sixth day of the journey focused on experiential learning. The participants engaged in conversations with community network operators to understand their problems, their method of work, and their experience with operations and maintenance of networks. To get a sound understanding of the network, the participants visited two locations under the Guna wireless network —Chippon (hopping point) and Aron (access point). The last three days of the training focused on learning assembly of Internet-in-a-Box.

While some participants were particularly impressed by the commitment of the wireless engineers in Guna to change the destiny of their community through a bottom-up approach rather than wait for a top-down movement, others could see how availability of communication services is essential to delivery of basic services, educational materials, disaster preparedness, governance, pump priming of local economy, training local human resources, among many others.

“I learned a lot about best practices of community radio stations and community network operators, by looking at the technical and legal requirements, for example, how can one engage with the communities in network establishment or management and make them understand the value of getting online. The training was a great learning experience for me, especially since I have been involved in the process of setting up a community network in Kenya. I realised that AFCHIX (a network of African Women in Computer Science), too, could benefit from building a community network by implementing the good practices that we were taught through this training.” - Irine Misoi, Member of Internet Society Kenya Chapter

**THE VILLAGE
BASE STATION
PROJECT
ADDRESSES THE
PROBLEM OF
DIGITAL DIVIDE
IN PHILIPPINES
BY MAPPING
POSSIBILITIES
OF COMMUNITY
NETWORKS**

“Availability of communication services is essential for delivery of basic services, education, disaster preparedness, governance, training local human resources among other reasons. Yet many villages still lack basic cellular infrastructure and Internet connectivity, especially in remote, rural areas. It is no different in Philippines. Thus, community networks promise a noble solution to this worldwide problem of a growing digital divide. The Village Base Station project, addressing this challenge, has been making rounds to several provinces in the Philippines, mapping possibilities to create local community networks. A government-funded project, VBTS aims to study the feasibility

**COMMUNITIES
NEED TO
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SOCIAL MEDIA
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PROBLEMS OF
SOCIAL MEDIA**

**BY PROVIDING
E-EDUCATION
TO SCHOOLS,
WE CAN HELP
THE YOUNG
GENERATION TO
CONTRIBUTE TO
THE ALLEVIATION
OF DIGITAL
ILLITERACY AND
POVERTY**

of deploying low-cost, low-power, compact GSM (2G) BTS that uses renewable solar power energy. The network is customised for small communities and managed locally by local government units (LGU) and cooperatives. In one of the community network stations in Aurora, the project is also conducting an impact evaluation study of communities with first-time access to cellular communications, with a purpose to provide insights on socio-economic change, social infrastructural needs and policy recommendations.” - Ronel Vincent Vistal, Research Associate at Village Base Station Project

“There is immense potential to create original narratives around leveraging community networks and empowering the community to do so. One idea is to leverage social media, for example to create cultural compatibility; community and family connections; create marketing and tourism opportunities using digital technologies. But the other side of social media, the problems of social media - cyber bullying, cyber racism, spread of sexually explicit content between minors – need to be factored in, addressed and curbed. My expectations from the programme were to learn digital footprints and adopt solutions suitable for my community, especially in education, health and community welfare. Therefore, my focus was and still remains to find key technologies that could help connecting our community. I will be displaying my prototype on the ICT Day in Vanuatu and would also be organising training for local barefoot engineers. I am also planning to start an educational project for rural areas by installing offline wireless access for schools.” - Paul Henry Yauko, Office of the Prime Minister in Vanuatu.

“A six-hour long journey by train and by road took us to Guna - a village in the state of Madhya Pradesh. We spent an entire week learning best practices in network engineering from our trainer Girish, who had built a wireless network that covered a large part of Nepal. By the end of the week, all the fellows had become friends and had learned tremendously from each other. During this while, we also took a field trip to village Aron where another community network was established. In Aron, the main clients of the network were the local business owners and public service providers. The impact of the network on the lives of rural community members was apparent. We also visited the DEF office in Aron, where we had a glimpse of the kind of work being done in other and related areas through an Android application called MeraApp that assisted rural community members to apply for insurance, subsidies and welfare schemes. I immediately saw the potential of similar applica-

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tions in Kyrgyzstan.” - Isabek Asanbaev, Member of Internet Society Kyrgyzstan Chapter

“I have been engaged in the development of Internet in Haiti since 1995, when the first connection was installed there. Having been largely involved in the technical side of establishing community networks, I was keen to look at the social side and witness how people around the world are empowering their communities by getting them connected to the Internet. And I was impressed by the commitment of the people of Guna to change the destiny of their community. The demography is characterised by very low income, whereas the geography is defined by very costly Internet, poor network quality and not necessarily with data provision. Yet, they understood how much being connected can be beneficial to them and they are dedicated to making it work. It is a wonderful inspiration and learning lesson.” - Reynold Guerrier, Member of Internet Society Haiti Chapter

The Community Network Champions are now back in their home countries with revived energy and commitment to establish, scale up and strengthen community networks in their regions, and help bridge the digital divide.



APPENDIX i:

AGENDA



31ST OCTOBER 2018

**UNESCO OFFICE, 1, SAN MARTIN MARG,
CHANAKYAPURI, NEW DELHI - 110021**

TIME : 0900 - 2030 HOURS

09:00 – 10:30

REGISTRATION, TEA & TECH DEMO

- Participants share their technology solutions
- Maarit Palovirta, Internet Society Kyrgyzstan Project
- Dinesh Pandian, Savemom
- Dr. Sarbani Banerjee Belur, Gram Marg
- Ronel Vincent Vistal, University of Philippines

10:30 – 11:30

INTRODUCTION, CONTEXT & EXPECTATION

Showcase Internet Society's engagement with community networks globally, especially in Asia Pacific; Identify common elements between community networks and community radio stations

- Rajnesh Singh, Internet Society
- Al-Amin Yusuph, UNESCO India
- Osama Manzar, Digital Empowerment Foundation
- N. Ramakrishnan, Ideosync

11:30 – 13:30

MAPPING SYNERGIES

Showcase best practices by community radio stations and community network operators; Discuss technical & legal requirements, community engagement, content consumption & production, and sustainability

- Al-Amin Yusuph, UNESCO India
- Hemant Babu, Nomad
- Dr. Sarbani Banerjee Belur, Gram Marg
- Dinesh Pandian, Savemom
- Ram Raghuvanshi, Radio Mann
- Osama Manzar, Digital Empowerment Foundation

Moderator: N. Ramakrishnan, IdeoSync

13:30 - 14:30

NETWORKING LUNCH



14:30 – 15:30

ROLE OF COMMUNITY NETWORKS & COMMUNITY RADIO STATIONS FOR PUBLIC WI-FI

Experts share views on how they can help create public Wi-Fi access spaces in a sustainable manner

- Dr. Sarbani Banerjee Belur, Gram Marg
- Dinesh Pandian, Savemom
- Vignesh, IIT Delhi
- Rajesh Kaul, iconnectwe, LMES
- Osama Manzar, Digital Empowerment Foundation

Moderator: Rajnesh Singh, Internet Society

5:30 – 16:00

TEA



16:00 – 17:00

ENGAGING COMMUNITY RADIO STATIONS TO CREATE BAREFOOT COMMUNITY NETWORK ENGINEERS

Identify how barefoot wireless engineers can be created with support from community radio station operators; Identify opportunities and challenges for the same

Moderator: Hemant Babu, Nomad

17:00 – 18:00

CONCLUSION & VOTE OF THANKS

Rajnesh Singh, Internet Society

Osama Manzar, Digital Empowerment Foundation

18:30 – 20:30

DINNER HOSTED BY INTERNET SOCIETY





APPENDIX ii:

ZERO CONNECT

A solar-powered Internet-in-a-box solution

According to the World Bank, as much as 70 per cent of India is yet to be connected to the Internet. This large population of unconnected Indians largely lives in rural and remote locations of India, where mainstream Internet Service Providers see little benefit in making available their services. It is in these areas that Digital Empowerment Foundation (DEF) deploys its Wireless for Communities (W4C) programme, an initiative started with the Internet Society and Ford Foundation, that involves utilisation of unlicensed spectrum through frugal technology.

Wireless for Communities is now in Phase VII. In this phase, DEF has conceptualised, designed and put into action Zero Connect, a solar-powered innovative, unique and cost-effective solution that offers Internet in a box, literally.

Designed by DEF, Zero Connect intends to bring into market a DIY plug-and-play configurable wireless networking solution for communities that continue to live in zero connectivity areas. Zero Connect comes fitted, as expected, in a trolley suitcase-box for easy mobility. The box holds built-in low-cost equipment and frugal technology, including wireless equipment for broadcasting, hotspot ticket printer for AAA compliance, solar-powered battery, router, Ethernet cables, connectors (RJ45), crimping tools and other accessories. Once unboxed, the equipment is put together—with the help of a visual user guide—on a DIY 20-foot tower ensemble made of a modified camera tripod and PVC pipes. The solution then acts as a makeshift mobile tower that can be packed into a suitcase and carried to any location. The DIY ensemble receives Internet connectivity from the backhaul through the radio antennas, using unlicensed spectrum (2.4 GHz or 5.8 GHz) and frugal technology. It then creates a wireless zone, and users can directly access the Internet with unique user IDs and passwords within a 360-degree-radius of up to 700 m. With the installation of a booster device, the wireless network can be accessed up to 5 km. The Internet in a Box can be used and installed by anyone and in any location with the help of a simple DIY manual.

The 5.8GHz antenna provides connectivity in a radius of 360 degree in a range of 3-4 kilometre; while 2.4 GHz antenna pro-



CURRENT SOLUTIONS IN THE MARKET ARE FIXED OR NON-FLEXIBLE IN NATURE

vide connectivity in a radius of 240 degree in the range of 3-4 kilometres.

Current solutions in the market are fixed or non-flexible in nature. They are also complicated solutions that require individuals to have advanced and rigorous training in network management and deployment. Internet in a Box, on the other hand, comes with a DIY manual so that users, with moderate knowledge in networking, can teach themselves how to operate the box to provide Internet connectivity to communities. Unlike several available solutions, the simple plug-and-play set up comes with a self-sufficient graphical guide. Once setup, minimal maintenance is required, and OTP-based AAA authentication via radius server will allow users to easily login to the system, without the need of complicated procedures. Yet, in case of assistance, customer service for deployment and troubleshooting is provided to rural network operators by DEF, telephonically or via site visits.

After the initial prototype was piloted in Ananthpur in Andhra Pradesh for six months with support from Goldman Sachs, Zero Connect was brought to the telecom dark regions of Nuh in Haryana, Ghazipur in Uttar Pradesh and Asoor in Tamil Nadu under a CSR partnership with Nokia for project Smartpur.

In these areas, DEF has provided a group of young community members with basic networking knowledge to set up, configure and troubleshoot a wireless network. With an aim to utilise Internet in a Box as an entrepreneurial opportunity, further training and refreshers programmes will be organised for these members to develop skills in digital and Internet literacy, and to leverage the Internet for information and digital services-based livelihoods. The eventual idea is to bring the



unconnected online as conscious consumers and producers of relevant or local content, respectively.

The larger objectives of Internet in a Box are to:

- Provide last mile connectivity in areas where mainstream ISPs are missing and people are yet to go online
- Improve access to digital services, citizen services, government schemes, information services and other opportunities that the Internet has to offer
- Promote local communication channels for better community engagement and links to the outside world
- Introduce rural entrepreneurship models to facilitate digital services through a sustainable model of community networks
- Improve access to education, health, finance, governance, livelihood and entertainment opportunities
- Encourage rural populations to become conscious consumers and producers of online content

Internet in a Box is a concept that has been designed to provide Internet connectivity in regions where its people are yet to go online and leverage the benefits of the Internet. The Internet is not the ultimate goal, rather it is the means to achieve the goals (services and opportunities).

**THE INTERNET
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The unboxing of Internet-in-a-Box





ORGANISERS



PARTNERS



COMMONWEALTH
of LEARNING



United Nations
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A program of  APNIC
FOUNDATION

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