

हिन्दी की बोर्ड



Barefoot & Connected

Socio-behavioural impact of campus-wide wireless broadband network at Barefoot College, Tilonia

Barefoot & Connected

Barefoot & Connected

Socio-behavioural impact of wireless broadband & digital intervention in a village campus

© Digital Empowerment Foundation 2016

Written by: Udit Chaturvedi

Concept by: Osama Manzar

Designed by: Kapil Verma and Jaspreet Singh

Photos from: Vimages.net

Published & Distributed by: Inomy Media Pvt Ltd

Contact: Digital Empowerment Foundation

House No. 44, Second floor, Kalu Sarai,

New Delhi - 110016

Tel.: +91 11 26532786

Email: def@defindia.net

Website: www.defindia.org / www.wforc.in

You can read this book online at defindia.org/publication-2

To know more about the project Wireless for Communities,
visit www.wforc.in or contact Ritu Srivastava at ritu.sri@defindia.net

Contribution/donation price: As per reader's wish

Wireless for Communities

In developing countries, wireless connectivity has emerged as an inexpensive technology to bridge the connectivity gap in remote areas. This wireless technology has created much interest in the international development community. In India, even with mobile penetration, tele-density in rural areas is still less than 40 per cent. The reason has mostly been the issues around last-mile connectivity, which has the potential to resolve the issue of prohibitive cost of deploying conventional wired infrastructure in remotest areas of the country.

Wireless for Communities or W4C is an initiative of Digital Empowerment Foundation (DEF) and the Internet Society (ISOC) that has been supported by various partners over the years.

Launched in 2010, Wireless for Communities or W4C aims to connect marginalised communities in rural, remote and geographically difficult locations of India, where mainstream Internet Service Providers (ISPs) are not willing to provide Internet connectivity as they feel their operations would not be commercially viable. W4C involves line-of-sight and low-cost Wi-Fi equipment, which utilise the unlicensed spectrum bands — 2.4 GHz and 5.8 GHz — to create community-owned and community-operated wireless networks.

Internet penetration levels in India are below world average and the penetration level in rural India is even worse. The combination of poor rural tele-density and Internet penetration further widens the divide between the haves and the have-nots, and therefore deploying traditional communications infrastructure may not be economically viable from both a service provider and subscriber point of view. Therefore, W4C aims to:

- Democratise the availability of connectivity
- Enable Internet accessibility in rural parts of the country
- Improve socio-economic benefits through a bottom-up approach
- Initiate dialogue and deliberation on the necessity of wireless network
- Address the issue of lack of content, products and services originating from rural areas
- Provide access to relevant government and citizen services and information
- Build a network to enhance cultural and traditional knowledge
- Deploy at least one wireless mesh network in a cluster to target a community
- Develop local human capacities by organising training programmes

In the last six years, DEF has connected rural and remote locations in as many as 38 districts across 18 states of India — and the numbers are only growing. Among these many sites that have been connected through W4C, Barefoot College campus — in a village called Tilonia that is located about 50 kilometres from Ajmer district in Rajasthan — is one of them. Under the W4C programme, DEF has made the entire Barefoot College campus fully Wi-Fi enabled.

Barefoot College

Barefoot College was established in 1972 by Sanjit Roy, more popularly known as Bunker Roy, with the aim of encouraging people to gain practical knowledge and skills rather than achieve qualifications and degrees. The mission of the college has always been to disseminate the 'Barefoot Approach' throughout rural communities around the world. These approaches are: sustainable knowledge and skills for communities; adapting a lifestyle in harmony with our environment; and overall community transformation and empowerment; equality among community members, collective decision-making within an organisation, decentralisation of planning and implementation at the grassroots level; self-reliance to solve problems and austerity in thoughts and actions; guide the people in Barefoot College and Tilonia. With effective and efficient solutions for solar, water, environment, education, livelihood and advocacy, Tilonia's Barefoot College is definitely a pioneer model of sustainability, which is setting an example for the rest of the country.

Barefoot College is, in fact, a perfect example of a completely self-sustainable 'smart village', and not just smart in the digital sense but also smart in their approach towards life, education, health and livelihood. The initiatives taken at Barefoot College to make it sustainable are commendable. What the College has effectively demonstrated is how sustainable the combination of traditional knowledge (barefoot) and demystified modern skills can be, when the tools are in the hands of those who are considered "very ordinary" and are written off by urban society.

Women from different parts of India and from developing countries in Asia, Latin America and Africa, spend six months on campus for a training programme to become solar engineers. They then return to their homes and light up their villages and communities with solar power. The college amphitheater is built upon a 1,00,000-litre rainwater collection tank, and the village's water consumption and management is tracked through an efficient data collection system. Men and women in the village run a beautiful handicraft and handloom shop. Here, a lot of decorative items, toys and stationary products are made from scrap found in the village. Some women are exclusively involved in the production of mosquito nets and affordable sanitary napkins, the use of which is also promoted in nearby villages through an awareness van. There is a school for children upto Class VIII, and even the chalk for blackboards is made on campus. For those who're busy working during the day, there are provisions of night schools. Puppetry is used for advocacy, and community radio helps in creating awareness and leading campaigns. There is so much more to experience and learn from in Barefoot College, Tilonia.

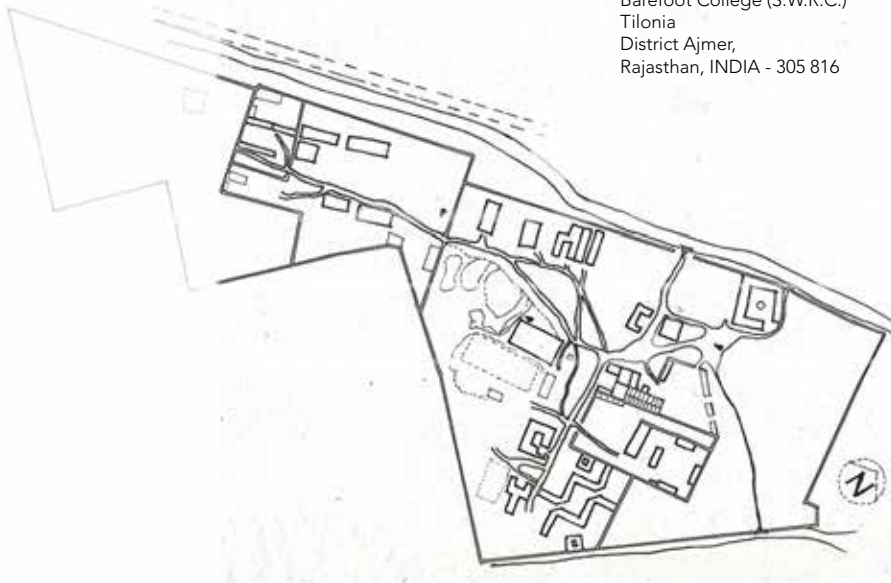
Since its inception, the long-term objective of the Barefoot College has been to work with marginalised, exploited and impoverished rural poor to lift them over the poverty line with dignity and self-respect. The dream was to establish a rural college in India that was built by and exclusively for the poor. Over the years, the College has applied rural traditional knowledge and skills to build homes for the homeless, collect rain water in rural schools and community, use solar power as a sustainable solution for rural India where power cuts are

common and last for hours; and spread socio-economic messages at the grassroots level through puppetry, besides other things. The Barefoot College located in the village, Tilonia in district Ajmer of Rajasthan state has been working with rural communities for 40 years now with a focus on cost-effective and self-sustainable barefoot solutions. The College runs many centres, including health care centres, 150 night schools, livelihood centres, field centres for multiple activities and rural craft training centres, among others.

The Barefoot College has demystified technologies and decentralised their uses by transferring the access, control, management and ownership of sophisticated technologies to rural men and women, who can barely read and write. The College believes that even uneducated poor have the right to use technologies to improve their life and skills. The Barefoot College believes that “literacy” is what one acquires in school, but ‘education’ is what one gains from family, traditions, culture, environment and personal experiences. Both are important for individual growth. At the College, everyone is considered an education resource, the teacher as well as the student and the literate as well as illiterate. Therefore, the Barefoot College is a radical departure from the traditional concept of a “college”.



Barefoot College (S.W.R.C.)
Tilonia
District Ajmer,
Rajasthan, INDIA - 305 816



Old Campus



New Campus

Wireless Internet network users of Tilonia

With an aim to analyse how the people of Tilonia are using the wireless Internet connection at Barefoot College, DEF carried out a survey in early 2016 and interviewed 47 individuals on campus. At any given point of time at Barefoot College, a maximum of 50 people are connected to the available Wi-Fi at the Old Campus and the New Campus. Besides these 50 user IDs, there are 30 floating IDs for visitors and Fellows.

Among those interviewed, 52 per cent of the people were men and the rest were women users of Wi-Fi at Barefoot College (Figure 1.1). These people came from varied age groups, starting from 16 years of age to 60 years of age.

Gender Distribution

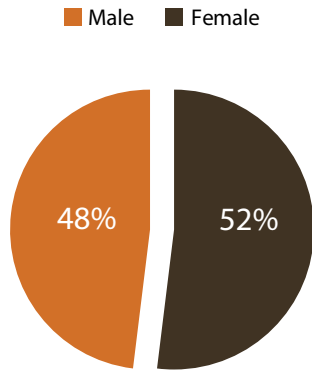


Figure 1.1

Users by Occupation

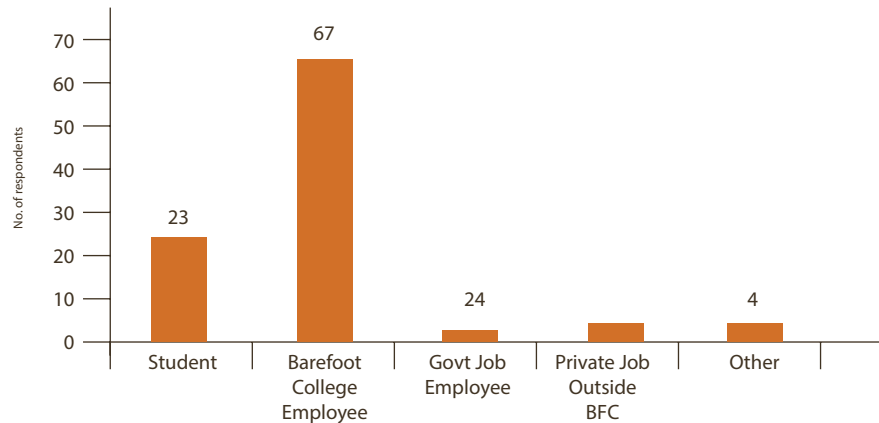


Figure 1.2

More than half the people interviewed were employees of the Barefoot College, working in various departments such as solar, water, advocacy, media and management, among others. This was followed by students living on campus but studying in nearby schools and colleges (Figure 1.2).

Mainstream education has never been the criteria for allocating jobs at Barefoot College, which believes that hands-on practical training is more important than textual knowledge. This would explain that only one-fourth of the people interviewed held undergraduate degrees (Figure 1.3).

Education Background of Users



Figure 1.3

All the employees at Barefoot College work on the minimum wage system, under which most of them earn between Rs. 5,000 and Rs. 8,000. Only 10 per cent of the employees earn more Rs. 8,000.

One of the major components of this survey was to prove that the Internet is a medium which can be accessed by all members of the society, irrespective of their religion, sex and caste. The access to Internet, in fact, promotes co-existence of all sections of the society. The access to Internet provided at Barefoot College, or anywhere else through DEF, is not discriminated on the basis of a user's caste (Figure 1.4).

Caste Distribution

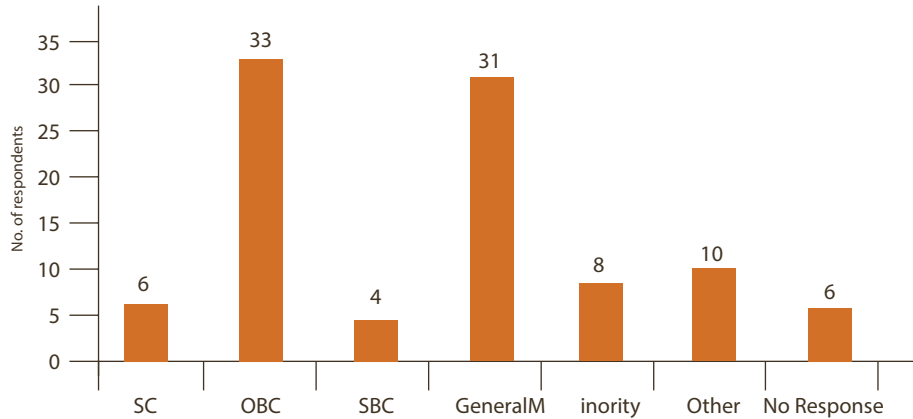


Figure 1.4

The people of Tilonia first received access to wireless Internet connection on July 25, 2015. With the availability to this network, access the World Wide Web became extremely easy for the people who work or live on the campus of Barefoot College. They not only access the Internet through their work stations but can also connect to the Wi-Fi, anywhere on campus and at any time, through their laptops or mobile phones. And the knowledge of computers or the lack of it has not been a deciding factor for who can use a computer and the Internet for what purpose (Figure 1.5).

Informal Training vs No Training

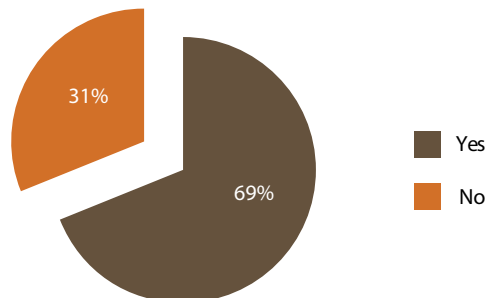


Figure 1.5

Access to a seamless Internet connection, across the 8-acre campus of Barefoot College, has made life easier for the staff and residents in many ways. Communication, especially, has been efficient and quick for both official and personal day-to-day work. This is followed by access to the Internet for educational and entertainment purposes, respectively (Figure 1.6).

Purpose of Using the Internet

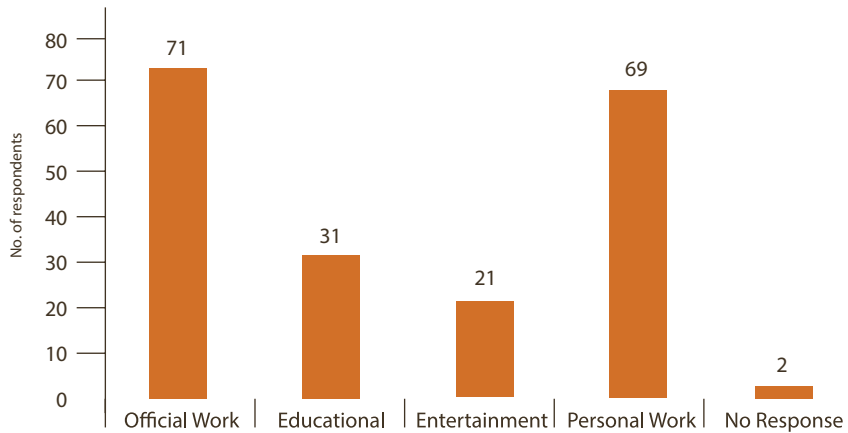


Figure 1.6

This means that different users access the Internet for different purposes, to suit their needs and demands. However, some of the most commonly accessed content over the Internet includes emails, social networking platforms such as Facebook and news in English or local language (Figure 1.7). Following closely are people who like to listen to music online or watch videos for entertainment or educational. Since there is a decent population of students on campus, either studying in Barefoot College or at government/private institutions outside, educational content ranks fifth in terms of the type of content access on the Internet.

Content Accessed Online

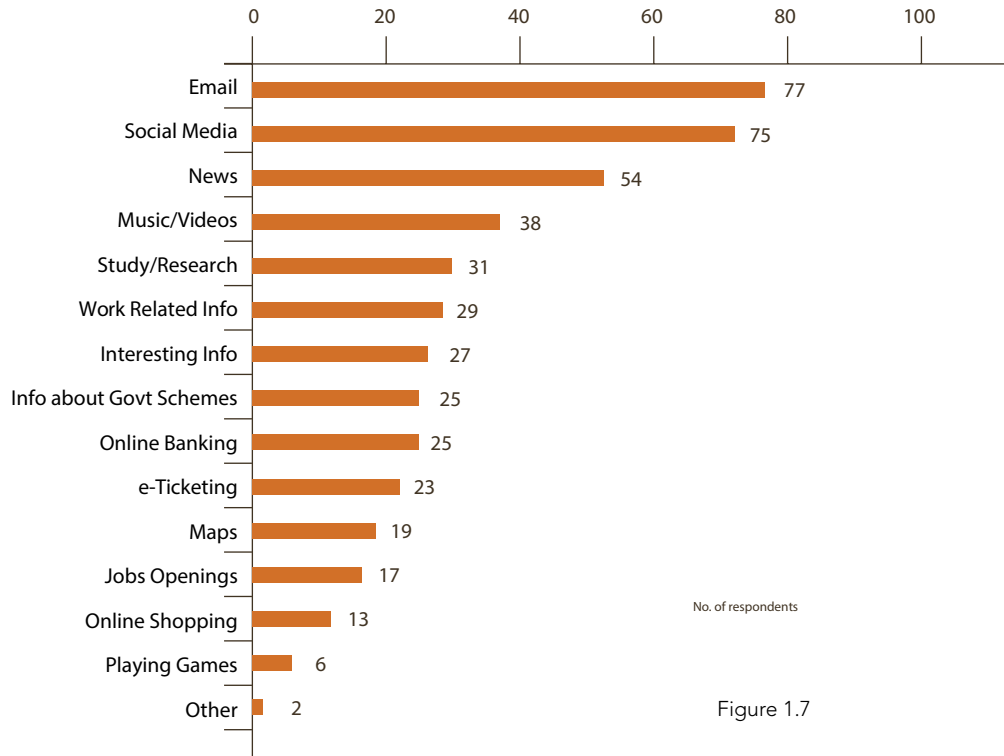


Figure 1.7

Of those interviewed, as many as 83 per cent respondents said that they find the Internet extremely useful for their day-to-day personal and professional lives.

Notes from a Barefoot Engineer's diary



MUKESH CHAUDHARY
Barefoot Engineer
Tilonia, Rajasthan

When I was first assigned the task to set up a wireless Internet network across Barefoot College's 8-acre campuses in the summer of 2015, I sat down with my senior, Jazbe Hasan Razvi, to chalk out a comprehensive plan for laying the network in Tilonia, Rajasthan. The next day, Jazbe left Tilonia and I took over the implementation responsibilities.

I started from the very first steps, placing two sector antennas on the tower, configuring the radio and the router. Then, access points and Internet stations were established at 10 pre-identified locations. After an Internet connection was set up, we got the computers in place, and taught people how to access the Wi-Fi connection on their laptops and mobile phones.

The staff and residents of Barefoot College were apprehensive about the security of the Internet connection, so I created individual IDs for all users. Those who wanted to connect to the wireless network, could only connect through their user ID. Also, every user was allowed a certain speed, which meant that no matter how many people are connected to the Internet at a given point of time, every user receives a certain minimum allocated speed.

One of the major challenges I faced here was to get an Internet line here. We had to wait for two months to get a BSNL (Bharat Sanchar Nigam Limited) lease line. During these two months, people were using the existing broadband connection, which had been distributed through Wi-Fi but the connectivity and speed were quite restricted. When we finally got the BSNL line, it went dead after first four days of functioning. We got it fixed, it worked well for two days and then again the connection was lost. This went on for a few months until BSNL gave us a fibre connection in December that year.

The next challenge was to provide a seamless connection to all devices. Initially, only mobile phones and laptops could be connected to the sector. But we faced a lot of problems in connecting the desktops through LAN. I called up other Barefoot Engineers and shared my problem with them, following which I understood the

technical glitch I was facing. Once I had that fixed, things seemed much more in place.

Today, about 50 connections are active across 23 departments of Barefoot College. Besides, a connection has also been given to a house in Halmada, a village located about 7 kilometres from Tilonia. This connection, too, has been pulled from the wireless network at Barefoot College.

Frankly speaking, teaching people how to use the login ID was a difficult task in itself. For the first 10 days, I went around helping people every morning to login. I would start getting calls from 9am. A lot of people would 'login', and once they were logged in, they would immediately click 'log out' and complain about not being able to access the Internet. So the users had to be taught such basic things as, "Do not log out after you have logged in. Instead enter the URL of the desired web page." Interestingly, the accidental logging out was a more common problem among the literates. Those who were not too educated did only what they were told and didn't click on any extra icons/text.

In the last one year, the wireless network has made connectivity and access quite easy. The Internet speed is not the best always, but that's not in our hand. However, I ensure people have access to a seamless connection and if any problem is raised, I try to resolve it immediately.

It's actually a funny scenario. Earlier, when people were using the broadband connection at Barefoot College, they didn't know who to contact in case of a grievance. The connection often used to be down for days, and nobody would complain. But after I started working on the network here, they call me for every little problem, even if the Internet is down for 10 minutes. Suddenly, the Internet has become more important than food for everyone here. Now, people depend on me for all software, hardware and network issues.



This book, through carefully selected stories of change, is a socio-behavioural impact analysis of how the wireless broadband connectivity provided under W4C has affected and impacted the people and practices on campus, which is spread across an area of 8 acres, and divided into two campuses — Old and New.



Their latest tools of communication are iPads & Wi-Fi

Women in Tilonia have found a new love

The women of Tilonia are in love. And this love is for their newly acquired iPads.

Strolling around the campus of Barefoot College in Tilonia village of Ajmer district in Rajasthan, you'll come across several women walking with iPads in their hand. And if there is any kind of celebration or event on campus, you'll see these women unlocking their iPads and recording videos or taking photographs.

I was super impressed when I saw about a dozen women recording an interactive session in their amphitheatre on their shining white iPads. There were about 450 participants plus at least a hundred members of the Barefoot College community but these women were not shy to move around and make sure that the event was captured from all angles.

Twenty iPads are used at Barefoot College for women enrolled for the national and international solar training programme. Another 10 iMac systems are used for training schoolchildren in digital literacy. The management and training responsibility for these Apple devices was handed over to New-Delhi based organisation Digital Empowerment Foundation (DEF). Incidentally, DEF is a long-term partner of Barefoot College for various digital programmes in the campus including community radio.

Children are always faster at learning anything new — after all it's their age to learn — but it's the village women who have shown great enthusiasm and skill in taking it to an iPad so quickly and comfortably. The video and photographs that are shot by these

women are then forwarded to the media department who edits the same, if required, and then share it through Barefoot College's website and social media pages.

Haseena, an associate of DEF who hails from Tilonia, too, learnt to use iPad and several other Mac machines and devices at Barefoot College. Since she picked very fast, she was been given the responsibility of teaching other women to use an iPad.

“It's an entire computer but without a keyboard or a mouse,” exclaims Prabha Devi, a 31-year-old woman who is residing at Barefoot College's New Campus for a six-month solar training programme.

In the classroom, these women sit in pairs and explore the many options and features available on the handy Apple device, as explained by their trainer.

FaceTime is one of the features that has the women completely in awe. When in their classroom, they love practicing how to FaceTime (an over-the-Internet video-calling feature available on all Apple devices) with each other, even if they're just sitting across the table from each other. All they have to do is connect to the free Wi-Fi connection available on campus, and hit FaceTime!

The women of Tilonia are not new to technology. They have an advanced traditional water harvesting system, an extremely efficient women team of solar engineers, a community radio broadcasting station,

machines for the production of sanitary napkins and a fairly active social media presence, including capabilities to use website and digital communication tools. However, a video-calling feature has still managed to impress them.

“I had no idea you could talk to somebody face-to-face with Internet so easily,” says Shehnaz Bano who hails from a small village in Karnataka but lives in the campus.

There is one thing that many rural areas may not be able to enjoy, and that is seamless availability of wireless Internet across the entire seven-acre campus of Barefoot College. Not only that, even the Old Campus of Barefoot College, which is situated one kilometer away from the New Campus and next to the Tilonia Railway Station, is fully Wi-Fi enabled.

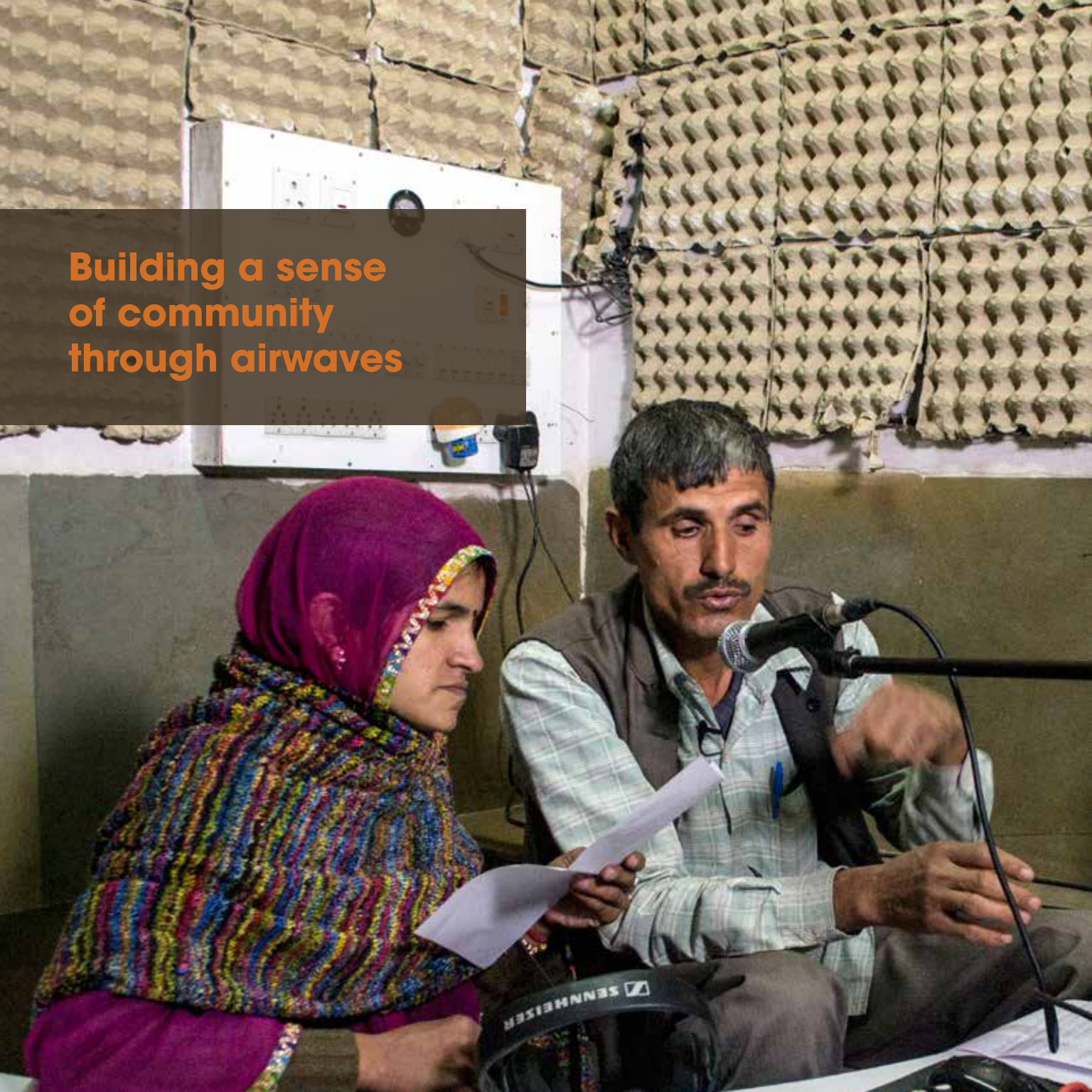
Barefoot College’s wireless Internet is a part of DEF’s Wireless for Communities (W4C) programme which has been initiated in partnership with the Internet Society (ISOC). So far, DEF has set up wireless Internet connections across more than 20 locations in the hinterland of India – mostly at places where no Internet would be available otherwise.

Thanks to wireless on the campus, the entire Barefoot College campus is now always abuzz with the use of digital tools: from checking emails to reading up about solar energy on Google Search, from using online translators to interact with foreign guests to

communicating with people spread across the world, from accessing health and awareness apps to audio and video documentation of activities in and around the campus, iPad is the tool in hand for these women.



**Building a sense
of community
through airwaves**



Supporting radio listeners, on air & on ground

Every morning at 7 am about 40,000-60,000 people in and around the village of Tilonia in Ajmer district of Rajasthan turn on their radio transistors and tune into 90.4 FM to listen to Norat Mal and Aarti Devi's broadcast.

The village's relationship with Tilonia Radio started on November 9, 2009, when Norat, who belongs to Tilonia, was helped by frugal community radio expert Raghav Mahto and four other men and women from Tilonia in setting up a makeshift broadcasting studio in Barefoot College's Tilonia Craft shop.

Raghav was a radio repairman from Mansoorpur in Vaishali district of Bihar who learnt how to broadcast radio programmes by a hit-and-try method. With an FM station range of 15 km, Raghav received fame almost overnight. From 2001 to 2006, Raghav FM attracted thousands of listeners until the local authorities noticed his unlicensed station and put shutters down on it.

With Raghav's experience, setting up a community radio station in Tilonia became much easier. Another factor that helped was the name of Barefoot College on the campus of which the broadcasting studio was to be set up. The idea to set up a community radio station was suggested by Mazdoor Kisan Shakti Sangathan founder Aruna Roy and Late journalist Ajit Bhattacharya, and its set up was facilitated by Digital Empowerment Foundation Founder-Director Osama Manzar. The thought behind it was to share the rich collection of audio/visual archive and social message-driven puppetry script with a wider population that was not just restricted to Tilonia. And so, Tilonia

Radio helped share these audio files through the medium of radio.

While the challenge was not in setting up an infrastructure, it was in generating/collecting content and using technology to broadcast it. The challenge is quite similar even today. While Norat has access to unlimited information now, the challenge is to pick content which would prove to be useful for the people of Tilonia and villages around it.

Before Norat got comfortable with using digital tools (he still considers himself to be a novice though), collecting data involved only primary ground research. It was only in 2012, that Norat was introduced to the amazing world of Internet. Today, fieldwork actually compliments his online research or vice-versa.

The World Wide Web, and Facebook especially, have been extremely beneficial for this purpose, believes Norat.

“I go into the field and collect content while Aarti handles the editing, rest is all *Ram bharose* (left to God),” Norat says and laughs. “These days, I get a lot of information on the Internet,” he adds.

Norat explains there is no dearth of information online. Besides carrying out regular interviews, interactions and vox-pops with the village, he looks for royalty-free broadcast material available on the Internet and often imbibes it for Tilonia Radio. The government is always coming up with new schemes or policies, so he also has to keep an eye out for gazette notifications.

However, lately all the government websites have been through or are going through a revamp. The position of content is being reshuffled.

“For example, the new layout of the rural development and labour ministries has made it difficult for me. I feel lost and have to literally search for information on every page of the websites,” he says.

This raises an important question. With the incumbent government so gung-ho about Digital India, they’re paying key attention towards making government websites look more appealing. However, in this effort of making the websites more “appealing” are they losing out on ensuring its ease of use or accessibility? Are there more people, like Norat, who feel lost going through the new government websites?

In the middle of our conversation, Norat is interrupted by two men from the village who’ve come with a set of papers.

After his interaction with them, Norat tell me, “This was my offline community radio. As I raise awareness among people about the Right to Information (RTI) through the radio, people from the village and nearby often come to me for more details about filing an RTI or for detailed information about some government scheme or another. The good thing about a community radio is that it not only supports people online but also offline.”

Norat and Aarti frequently organise offline awareness sessions for villagers as well. Most recently, on January 12, 2016, a special event was organised in which several activists were invited to talk about pension, ration and MGNREGA. The event was part of an upcoming 13-episode broadcast series called ‘*Ab Ki Baar Mera Adhikaar*’.

Returning back to our conversation about using the Internet for content generation, Norat says, “I don’t know much about Facebook, except how to accept friends and like what people say. In fact, I hardly post anything on Facebook. Instead, I like to read what others write.”

Facebook has been a platform where harbingers of community radio have formed a community of their own. There are dedicated pages for various community radio stations that share content that they have broadcasted. If their content is applicable or useful for another region, it is picked up by the respective community radio station. There is also a document on the Google Drive where everyone can share open content. This way, community radio stations get to share content with each other, which would otherwise not have been possible. This creates a larger sense of community — the community radio content that was otherwise available for a population within the 15-km radius becomes available and useful for people across the country through the Internet, and subsequently the radio.

“Today, you can apply for all kinds of identification cards — such as Ration Card, Aadhaar Card and Wage Card, among others — online. There are a

lot of good government schemes, especially for girl child and education — that are available for the people. The people just don't know about it. So, as a community radio broadcaster, I have the responsibility to make people aware about such schemes, which is why I have to stay on a look out on the Internet for any new or upcoming government scheme," he adds.

Tilonia Radio is live every day in Hindi and Marwadi from 7-9 am, 12-2 pm and 6-9 pm.

Digital Empowerment Foundation (DEF) provides Tilonia Radio with technical, strategic and content advisory support. The Indian Institute of Technology, Delhi is also an online support provider to the community radio station. It was DEF who had recommended and asked Raghav to assist Norat in establishing a low-cost broadcasting studio in Tilonia, and then provided further training for content generation and sustainability.

On July 21, 2015, under the Wireless for Communities (W4C) programme implemented by DEF in partnership with the Internet Society (ISOC), DEF set up a wireless Internet connection at Barefoot College in an effort to take the Internet to areas where there was no access. Radio Tilonia now uses this Wi-Fi connection for its broadcasting purposes.

Radio Jagriti in Birni village of district Giridih in Jharkhand and Radio Bulbul in Bhadrak district of Odisha are two other community radio stations for which DEF provides financial, technical, strategic and content support. Henvavani Community Radio

in Chamba region of Uttarakhand is a partner for DEF's Soochna Seva programme in the state. Over the years, DEF has also recognised the efforts of at least 25 others by awarding them with Manthan Awards under the category of Community Radio which was introduced in 2007. DEF Strongly believes in the power of the community as a tool of mass communication and information dissemination.



**Social media helps
them stay in touch with
their family back home**

WhatsApp makes Solar Mamas feel at home

Barefoot College in Tilonia is known for groundbreaking work in the area of solar energy. Every year, a batch of 20-30 women is brought to Tilonia from developing countries in Asia, Africa and Latin America; and another batch is from rural hinterlands of India to be trained to become solar engineers.

During the six-month training programme, these women who are known as Solar Mamas, learn to fabricate sophisticated charged controller inverters and install solar panels, and link them to deep cycle batteries through sign language and colour coding. Their extraordinary guts to come to a strange country and learn about solar technology — when they have never even been to a school — show their willingness to learn.

When the women complete their training, they become barefoot engineers. These barefoot engineers can work at night under the light of solar lanterns, they can complement their household income by producing handicraft after sunset, their children can study at night, they can prepare meals on solar cookers, heat water in solar geysers and even light up their entire village through well-engineered solar panels and lamps.

However, with hands-on training come challenges as well. The first of those challenges is staying away from home and family, with a group of unknown people who don't even speak the same language. In a scenario like this, homesickness is certain. To fight this urge to return home, Solar Mamas use WhatsApp as a tool for communication. While the mamas share the images of their new friends from Tilonia, they also receive pictures of their children and grandchildren from Africa or Asia.

Spiwe, a Solar Mama, showed me the pictures of her three girls and said, "They're growing up so quickly. I can't wait to go back and hug them."

Besides sharing images, the Solar Mamas use WhatsApp to send text messages to their friends and family back home or talk to them through over-the-Internet WhatsApp voice calls.

In the free time, after their training of the day is completed, these Mamas can be seen sitting around Wi-Fi access zones on campus and typing away on their touchscreen smartphones as they catch up with their folks back home.

There are a few Mamas who're comfortable using Facebook, and can be seen chatting with their friends in the common room, taking turns to use the lone computer in the room. But some of them know no English at all, in such a case using Facebook becomes sometimes a more tedious task.

WhatsApp also given them the liberty to send and receive voice notes. Most of the Solar Mamas come from remote and rural locations from their respective countries. Many of them have never been to school or have been school drops. Their knowledge of English is restricted or they don't understand any language other than their mother tongue. In such a case, voice notes allow them to speak to their loved ones back home in their own language, in their mother tongue.

"I often spend time just listening and re-listening to the audio notes I get from home," says Anna, another Solar Mama from the last batch.

Speaking about the barrier of language, as soon as a new batch of mamas arrive in Tilonia, a chart is placed on the two ends of the workshop (a long room with tables running the length to accommodate mamas to sit together and work on circuits) with the names of countries from which the mamas have come. Next to these is a chart which lists the names of colours like red, green, black and yellow in the languages of the respective countries.

This information is retrieved by the trainers through online dictionaries and Google translators to help in the training of the Solar Mamas. Because language can be a big barrier, trainers use simple sign languages and colour coding to teach solar engineering to these women.

YouTube and Google Search is often used by them to understand concepts of solar energy and solar engineering.

The solar training programme of Barefoot College is supported by the Ministry of External Affairs which supports Mamas' travel and makes necessary arrangements for their visa clearance.

Barefoot College trains middle-aged women from rural villages worldwide to become solar engineers. In partnership with local and national organisations, the Barefoot team establishes relationships with village elders, who help identify trainees and implement community support. Trainees are often illiterate or semi-literate grandmothers who maintain strong roots in their villages and play a major role in community development, bringing sustainable electricity to remote, inaccessible villages.

Solar electrification reduces carbon dioxide emissions, slows the negative impacts of deforestation and decreases air

pollution from burning firewood and kerosene. With this in mind, Barefoot College specialises in solar lighting, solar water heaters, solar generators, solar cookers and India's first solar-powered water desalination or reverse osmosis plant that produces 3,600 litres of clean water daily and provides drinking water for over 1,000 villagers.

Over the years, women from 77 countries have been trained to become Barefoot solar engineers; 4,020 grams of harmful carbon emissions have been avoided by replacing kerosene with solar as a source of clean energy for light, heat and cooking; and over 14,500 households have been equipped with solar systems.



महिला बेयरफुट
सोलर कुकर
जनियर सोसायटी तिलोनियां





**The college believes
in gifting stories
and asking for help**

Internet brings in a new era of fundraising

When it comes to the social media strategy of Barefoot College, it believes in 'Gift-and-Ask' in the ratio of 70:30. While 'ask' is any post or update that asks the public to click, donate, share or do something; a 'gift' is a post which provides information, knowledge, inspiration and stories that will improve the lives of readers/audience in some way or the other. In fact, when a gift is appreciated, it initiates a relationship and a dialogue with the receivers. It also makes them eager to help on the next 'ask' occurrence, believe people at Barefoot college.

While websites and social media have been an integral part of communications for a few years, even for Barefoot, the avenues of crowdfunding were opened for it in 2014. Today, the team uses social networking platforms like Facebook, Twitter, Instagram and Google+; video streaming and sharing tools like YouTube; and crowdfunding platforms like Ketto and Crowdrise to seek financial contributions from people spread across the globe.

These platforms, and more importantly the access to the Internet, have made it extremely easy to share the stories from Barefoot College with the rest of the world. Today, the communication team along with the community members is always on the edge to share the most inspiring stories from the ground. Daily posts through their Facebook and Twitter handles reach thousands of people every day — 1,05,910 on Facebook and 3,051 on Twitter to be precise.

"Barefoot College has prided itself in being a self-managed village and as we are growing, we are

training our local villagers to take over the tasks which have had to be handed over to other experts (curriculum developers, volunteer coordinators and digital communications, among other tasks). Digital literacy is a fairly new topic and resource for remote villages. Villagers are only beginning to understand the full capacity of social media now. For this reason, we are actively waiting and looking for the right individuals who have the capacity to manage the multiple digital communication platforms we have carefully created in the last three years. I am eager to see the day we have a new generation of villagers with efficient digital literacy skills that can share the stories from the ground with the world," says Lawrence Miglialo, a storyteller who works with the digital communications team at Barefoot College.

Helping Lawrence and Barefoot College in this vision is Digital Empowerment Foundation (DEF) and its wireless Internet network.

At Barefoot College, DEF also runs two Community Information Resource Centres (CIRCs) where children and adults are trained in digital literacy by trainers appointed by DEF. Twenty iPads are used at Barefoot College for women enrolled for the national and international solar training programme and another 10 Mac systems are used at the institution for training school children in digital literacy. So now, whatever be the activity or event at Barefoot College, you'll be able to see women recording videos or clicking photographs on their shining white iPads like pro and updating their web presence through iPads or iMacs.

From the highlight of the day to stories about the men, women and children of Tilonia; from beekeepers on campus to community radio shows; from achievements of Solar Mamas in India and Latin America to announcements about Bunker Roy's speeches across the globe; and of course all the latest updates about events and activities on campus — all you need to get updates is stay connected with the College's social media pages.

While engaging the audience or readers has never been a difficult task for Barefoot College, courtesy the enormous and impactful work they've been doing for decades in the region, the real challenge lies in internally communicating a dissemination strategy.

“Considering the Barefoot community works in 75 countries in different continents, there can often be overlapping emergencies. We love our supporters and we would not want to spam their newsfeed with too many demands,” adds Lawrence.

This makes sense because their channels are not solely for donation streams but are also to socialise with people who are making similar impacts in different parts of the world, to share the activities of Barefoot College, and to share ideas of making every village a smart village — not just in the digital sense but beyond, which includes breaking stereotypes, busting myths and becoming completely self-sustainable as a village community.

Through the testimonials of beneficiaries, before and after moments of projects, and stories of change

people around the world can witness the changes that are happening in this remote village. And these are the changes that inspire people to donate for various causes and projects at Barefoot College. Clubbed with crowdfunding tools, the results are smile encouraging.

“Crowdfunding is a powerful tool,” Lawrence says, adding that, in the last couple of years, Barefoot College has received around \$400,000 through online sources.

This says a lot about the stories that are reaching the ends various parts of the world through the medium of the Internet.



A man wearing a blue and green plaid shirt, blue jeans, and a blue cap is kneeling on a striped mat. He is pouring a clear liquid from a white plastic bottle into an orange bucket. In the foreground, there is an open notebook with handwritten notes and a yellow pencil. Several other white plastic bottles are visible on the mat. In the background, there are shelves with various colored folders and a white container.

Neerjaal is a drinking water and sanitation information system

Conserving drinking water, offline and online

One of the major solution areas under which Barefoot College in Tilonia, Rajasthan, works is Water. Each individual on the campus believes that every drop of fresh water that falls on the ground should be harnessed for use. And so, they use various techniques and methods to conserve as much water as possible.

For this purpose, the College combines traditional harvesting practices with new technologies to make water accessible, clean and safe to drink for millions of people. One of the flagship activities includes rainwater harvesting. The campus collects rainwater from rooftops and stores it in low-cost underground tanks. Barefoot College, itself, has an underground tank with a capacity of 5,00,000 litres underneath its amphitheatre. Additionally, Barefoot College supports the construction of three dams that bring drinking water to more than 100 communities. These dams are not repurposed for energy but support the water demands of the people and livestock living in some of the most arid regions. Altogether, Barefoot College's initiatives towards conservation of water help collect water in 15 states for 32 million people.

Complementing these on-ground offline efforts is Neerjaal, an online drinking water and sanitation information system.

Neerjaal, initiated by Digital Empowerment Foundation and the Barefoot College, is a web-based water quality mapping tool that seeks to create a water management portal for communities at the grassroots level. The vision behind the project is to empower every villager to collect information about water resources in their vicinity, create and share

reports on public domains, and gradually lead the community members to make informed decisions for water management.

Under this project, community members have been collecting and managing information regarding various linkages of water in the deserts of Rajasthan, especially in and around Tilonia. The information is collected through various statistical reports and tests and then exported to the online reporting and documentation portal of Neerjaal.

Through this project, members of the community have been strengthened to test water on a wide range of physical (such as temperature, colour and odour) and chemical (such as chloride content, fluoride content, pH level and hardness) properties to check whether or not they are in excess of the standards laid down by the Bureau of Indian Standards and it's absolutely amazing to watch villagers gather, test, analyse & update information all on their own.

Empowered with this information, the communities are also able to spread awareness about health and environment issues stemming out of polluted or inefficiently managed water.

“Therefore, Neerjaal not only helps in water conservation and management but also ensures community sensitisation and capacity building of the villagers,” says Tara Choudhary who manages the content on the Neerjaal website.



**e-Communication
has made visitor
facilitation easy**



Evolution of communication on campus

Over the years, communication has moved from post and telegram to telephones and now to emails and social media.

Ramkaranji, who looks after external communication, guest facilitation and lodging, says the Internet has been extremely helpful to his work.

“Earlier, when we had a broadband connection, we would use emails for communication but there would be periods when the Internet would be down for days at a stretch. This posed a lot of problems for us,” he says.

However, with the introduction of a seamless wireless network, communication has become easy, quick and efficient.

Every day, Ramkaranji receives a bulk of new mails from people around the globe who are looking for an opportunity to visit Barefoot College or volunteer on campus. Thanks to the Wi-Fi connection, he doesn't even need to be on his seat to check his mailbox. He can simply check his mail anywhere on-the-go from campus and respond to it immediately.

“Work has definitely become easier,” says Ramkaranji. Coordinating between people has become efficient, he says.

“All our conversations from a query to collaboration are recorded and stored in emails. We can always go back to any of the messages in case of confusion without the need of flipping through a hundred physical pages. It also makes it convenient for us

to track who is coming when, and to have their lodging arrangements ready before they arrive,” he adds.

Barefoot College's wireless Internet is a part of DEF's Wireless for Communities (W4C) programme. Thanks to wireless on the campus, the entire Barefoot College campus, Old and New, is now always abuzz with the use of digital tools.



**Madiyash dreams
of becoming a
freelance journalist**

A young girl has big aspirations

Madiyash is a new recruit at Barefoot College who has been hired by Digital Empowerment Foundation as a coordinator. She is 18 years old and aims to be a journalist.

After carrying out her responsibilities at work, Madiyash walks back home every day. It's about a 15-20 -minute walk, and Madiyash tries to be home before sunset so that her family doesn't get too worked up about her safety. At home, she helps her family in the household chores. At work, she is a promising and hardworking young lady who trains children in computers and plays with children in the primary school; at home, she is contributing to her family income.

Madiyash had to put a break to her studies after Class XII. Her father died unexpectedly, and the family didn't have enough money to support the higher education of all their children simultaneously. The eldest daughter was married and the family decided to let the middle child — Madiyash's elder brother — continue engineering.

Madiyash now hopes to go to college next year, after her brother has graduated from college and found a job for himself.

In her free time at Barefoot College, she reads news on her phone or the work stations and looks up for possible courses she can pursue she also watches news bulletins on YouTube to practice her skills.

Madiyash is hoping that in a couple of years, she will

be able to contribute as a freelance online reporter and share stories from Tilonia and nearby areas with the rest of the world.

Madiyas is now set to be trained in using Apple devices, so that she can assist Haseena, a computer trainer at Barefoot College, in teaching children how to use iMac applications like Pages, Keynote and Numbers.

**Advocating hygiene
for women in villages**



Four women make low-cost sanitary napkins

People usually start thinking of retirement when they're about to touch 60 but not this woman. Sixty-year-old Bodhi Devi has been working with Barefoot College in Tilonia for the last three years, ever since her husband died of a heart attack. She lives on campus with her two sons, two daughter-in-laws and four grandchildren; both her daughters are married and settled with their respective husbands in nearby villages.

Like most women in Tilonia, courtesy the impactful work that Bunker Roy and his team have been doing, Bodhi Devi is much more aware of health and sanitation issues than women in nearby villages and other parts of the country. And she doesn't consider talking about menstruation a taboo. In fact, she manufactures low-cost sanitary napkins in a small production unit on the Barefoot College campus along with three other women — Lada Devi, Netal Devi and Shanti Devi.

From procurement to production to even distribution, these four women handle all of it. These women need no man to help them.

“Though we sometimes need a man to drive us to nearby villages but I think one of the girls here will soon learn to drive,” she quips.

Special cotton for production comes from Pune; this cotton is rolled into small cotton balls. Once that's done, it is put into a cotton batting machine to get flattened even strips of cotton. Gum and a reliable super bond is mixed with water and made into an

adhesive solution, which is applied on either sides of the cotton strips and pasted on narrow plastic sheets. The napkins are then pressed using a machine. This process only gives rectangular sanitary napkins. So they use advanced cutting machines that use heat and pressure to give shape to the sanitary napkins and emboss a pattern on the centre of the pads. At the end, the sanitary napkins are sanitized and packed into boxes of eight or 12 pads which are then sold for Rs. 15 and Rs. 20, respectively.

Once the boxes are marked and sealed, they are put in large carton boxes and placed in a jeep. At least one woman travels in this jeep to villages in Jaipur, Ajmer and Kishangarh districts, besides 30 balwadis, to encourage women to buy low-cost sanitary napkins and to advocate about the importance of hygiene. Each sale is tracked and recorded in the bill book and the money from the sales is used for further production of sanitary napkins and to maintain the sustainability of the production unit.

“Today, nobody in Tilonia wears a cloth napkin or piece of sack bag,” she says proudly.

Until a few years ago, people had to use pieces of sack bags and lined their underwear with it. “It wasn't only unhealthy but also extremely painful,” she says.

However, if it wasn't the sack bags, it would be the cloth napkins, which would still often lead to diseases and infections because they would never sanitise after use. There was just no cheap alternative to sanitary napkins available in Tilonia — buying

branded products like Whisper or Stayfree was not in their budget. There was also nobody to make them aware about the importance of using sanitary napkins.

“So we started producing our own brand of sanitary napkins. Not only that, we started door-to-door campaign where we would meet the women of the houses and talk to them. If there were any misconceptions about using sanitary napkins, we would try to remove those. We still hold public meetings frequently in nearby villages of Rajasthan. And we are always trying to visit new villages,” she says, adding that talking about menstruation and sanitary napkins in an open environment is not very easy in rural India. Shy people, especially, have to be dealt with a lot of care.

Thankfully, in Tilonia particularly, there have not been any superstitions attached to menstruating women. In a lot of rural and remote areas, menstruating women have to live in the outhouse or sleep on the floor or are not allowed in the kitchen and temples. But not in Tilonia.

Producing low-cost sanitary napkins and advocating about it is, of course, an initiative that must be applauded but, in a remote village like Tilonia, it is also an achievement that women here are not treated differently if they are on their periods. It's a sign of how evolved the community is and how they will treat their women. It is something that must be celebrated.

The reasons behind this approach is education and awareness, the principle with which DEF also runs. And that is probably why we've been committed towards ensuring that every child in Tilonia is digitally literate and every adult is aware of his or her rights and entitlements. Today, these four women are travelling from one village to another to sell the sanitary napkins. In the future, we hope, they will be able to sell their low-cost sanitary napkins to women in different parts of India through the medium of e-Commerce or even social networking platforms like Facebook where they can take orders online and ensure the delivery offline.



This book, through carefully selected stories of change, is a socio-behavioural impact analysis of how the wireless broadband connectivity provided under Wireless for Communities project, an initiative of Digital Empowerment Foundation and the Internet Society, has affected and impacted the people and practices on campus, which is spread across an area of 8 acres, and divided into two campuses — Old and New — in Tilonia village of Ajmer district in Rajasthan.



www.wforc.in



www.defindia.org



www.internetsociety.org



www.internetsociety.org