



DIGITAL GREEN PRAKRIYA (PROCESSING)

FOSTERING DIGITAL ENVIRONMENTAL JUSTICE THROUGH
COMMUNITY REPAIR AND REUSE NETWORK IN INDIA:



A PILOT REPORT

Digital Green Prakriya (Processing): Fostering Digital Environmental Justice through Community Repair and Reuse Network in India

A Pilot Report

Digital Green Prakriya (DGP) is an initiative by the Digital Empowerment Foundation (DEF), supported by the Association for Progressive Communication (APC)

Knowledge Partner: Council for Social and Digital Development (CSDD)

@2022-2023





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PROJECT OVERVIEW

Despite being the only South Asian country with an E-waste law in place, India is severely lagging behind in formally collecting and handling e-waste in an eco-conscious manner. India is the third-largest e-waste generator, producing over 3.23 million metric tons of e-waste per year, behind the US and China. While hardly anything ends up in a landfill, the big worry is that 95% of e-waste still continues to be handled by the informal sector.

Globally, in regard to electronic goods, the linear model of the digital device economy encourages a disposal culture whereby the consumer is encouraged to buy new electronic products instead of repairing and reusing them. This is also being done by advertising every new model of the products as a symbol of higher status which will lead to the upward mobility of the buyer. Companies do not design products with the idea of longevity nor do they make repairing electronic goods an easy task as many times they need specific hardware or software which is not easily available. Moreover, high repair expenses render the disposal culture a better option among most consumers. Driven by market competition, companies boast of better upgrades such as more storage or higher pixel camera without acknowledging the environmental, economic and social impacts of the design.

In India, the problem is even more so exacerbated, with increasing digital consumption, where infrastructure, awareness and culture of repair and reuse are scarce. Such culture does not just add to continuing environmental degradation through excessive mining of precious metals, razing forest cover and accumulation of e-waste, but also exploitation of human labour at the lowest rungs of the global economic order. This also pushes the whole e-waste handling into: (i) Dumping into the nature backyard which is harmful to local ecology, (ii) end up in the hands of the local repairers and then to the larger informal e-waste collectors who are not driven by eco-conscious motives, and (iii) posing chronic health hazard to e-waste handlers.

The need is for a community-led and based initiative towards an integrated digital device repair, reuse and management through capacity building in local communities - playing key role in reducing local negative environmental impact of digital device usage culture; community coming forward for effective e-waste safety and care; and wider community awareness on proper management of electronic waste.

This is also in the context of very recent initiative of the Ministry of Electronics and IT, Govt. of India to bring out a final draft on 'Circular Economy in Electronics and Electrical Sector in India', a much need policy drive, that also talks of the need to work and engage communities in this entire process, including awareness and capacity building in the circular processes.

I. METHODOLOGY

Rooted in the philosophies of the circular model of the economy, the Digital Empowerment Foundation (DEF) piloted an initiative called '*Digital Green Prakriya (DGP)*' during 2022-2023 with the help of a micro-grant by the Association for Progressive Communications (APC) in two locations – Nuh (Haryana) and Chanchalguda (Telangana) towards the stated problem. The underlying goals of the initiative are threefold – **firstly**, fostering eco-conscious cultural behaviour and changes in the community towards digital device circularity including eco-conscious consumption patterns targeted to reduce carbon footprint per household; **secondly**, a community-based digital device managing facility that supports better responsible management and participation in device usage, repair and reuse; and **thirdly**, promoting and strengthening local capacities in education, knowledge and skills to better manage devices for digital environmental justice locally.

a) Repair Infrastructure / Repair Cafe

A primary reason behind the lack of a repair culture is the lack of the very infrastructure that would enable such a culture. By creating an accessible centre where people can bring their electronics for repair will help elongate the lifespan of an electronic product. This will reduce the consumption orientation of the community with respect to electronic goods. The DGP centre under the project employs local repair experts on a part-time basis for counselling and full-time café managers/primary repairers/social entrepreneurs with existing skills-sets but lack of resources to start their own ventures. This not only generates jobs but also promotes local skill sets and an ethos towards appropriate management of e-waste and affordable repairing.

b) Repair Knowledge Hub

Fostering a culture of repair and reuse cannot be limited to accessing infrastructure but must extend to the democratisation of those very skill sets and processes. The community repair facility's role is not limited to merely providing repair services but also functions as a hub that imparts knowledge on repairing electronic goods to people who come to it for repairing their goods. In this way, a person approaching the centre for repairing the electronic good will return with not only a repaired product but also practical knowledge of fixing the problem themselves should it arise again in future. This is further buttressed by conducting workshops and awareness drives through announcements and leaflet distribution on repair-reuse-recycle, digital ethics and digitally responsible citizenship. This further encourages capacity building and eco-conscious cultural behaviour.

II. OBJECTIVES

Objective 1: Low-Cost Repair Infrastructure

Project contribution: DGP aimed to provide an easily accessible repair centre with low-cost repair to encourage people to undertake repairs of their electronic devices instead of disposing it and purchasing a new one, to extend the products' life span and usage.


Two DGP centres have been established across two locations – Chanchalguda, Hyderabad (Telangana state) and Tain, Nuh (Haryana state), manned with state-of-the-art equipment and tools for repairing digital gadgets. In Chanchalguda, the program has onboarded a resource person/expert repairer with the requisite repairing skills and deep technical knowledge who is willing to become part of the DGP program for the long term and provide regular affordable repairing services in the community. He is willing to take the program forward, rooted in the philosophy of the circular digital economy, undertaking activities and providing services aimed at encouraging repair and reuse in the community and thereby, engendering a repairing culture as opposed to a disposal culture.

Objective 2: Knowledge, Awareness and Skill Generation

Project contribution: The DGP centre aims to democratise repair and reuse by spreading knowledge on simple repair techniques that a user can apply by themselves. The centre also aims to foster digital consciousness and encourage citizens to be digitally responsible, especially towards e-waste management. Towards this goal, the DGP teams at the two locations have carried out door-to-door campaigns, organised an e-waste collection drive and conducted repairing workshops on 5 different topics which were deemed as relevant to the demands of the community, directly and indirectly reaching 60 participants and about 30 households in the two locations.

The workshops were participatory in nature where the participants were engaged in dialogue about environmental sustainability and justice and informed about circular economy as well as the issues surrounding E-Waste through audio-visual mediums.

The workshops were further targeted to involve the participants in repairing activities on different topics with a theoretical background as well as practical demonstrations and activities. The pilot program has achieved to take the first few steps towards community mobilisation by focusing on raising awareness and knowledge building through both theoretical and practical approaches.



The next step for the program would be to aim for capacity building and skill enhancement of the community members to become self-sufficient towards the repair and reuse of digital devices. While being convenient for the user, this will also help lower the cost of repair. Such knowledge dispensation and awareness generation will develop ownership over digital products as a part of the digital citizenship value system. Moreover, it will reduce the burden on nature which is created by e-waste accumulation in the long run.

Objective 3: Income Generation and challenge to gender roles

Project contribution: While the project aims to encourage gender-inclusivity with women-led community repair centres in the long run, the ground reality proved it difficult to find such a person in 3 months to manage the centres. The program has tried to incorporate female participants who can be provided with adequate skill training and awareness to become environmental community leaders in the future as well as use their skills to challenge the gender roles where women are rarely seen in the roles of repairer, working with technical and mechanical objects as often encouraged through the STEM subjects.

The project aims to develop a robust gender-inclusive program not just in the present two locations but across more locations with more women in leadership role in the DGP centres. Currently, due to existing social norms and gender biases around the subject, only 25% of the total participants were female. But it aims to challenge the roles through targeted campaigning and outreach efforts and increase the number of female participants overall, especially through capacity building and training to become repairers and managers of e-waste with eco-consciousness.

However, in terms of the program objective regarding “income generation”, it has been able to kickstart the self-financing model at least at one location i.e., in Chanchalguda through the efforts of the centre/repair café manager (digital entrepreneur) and the DGP resource person/expert repairer. It is trying to kickstart the entrepreneurship model in Nuh as well at the moment.

III. PROJECT PRIORITY: CAPACITY BUILDING

In Digital Green Prakriya, through capacity building, DEF aimed to contribute to reducing the negative environmental impact of digital technologies, promote digital safety and care, and generate awareness of the proper management of electronic waste. The initiative's holistic design focused in ensuring that the community centres work at multiple levels enabling productive outcomes for a circular economy in the community.

Through the community-driven solution of developing a repair ecosystem and appropriate management of e-waste, DEF wanted to encourage digital citizenship and accountability in the use of electronic goods. The community centres are therein, aimed towards building local-level capacity. By imparting repair skills, the centres are developing a duty of care towards electronic goods and a sense of fulfilling digital ownership. Lessons on digital ethics, use of electronic goods and eco-consciousness work at impacting behavioural change and thus reducing technology's negative impact on the environment.

IV. ACTIVITIES

Activity: Identification and engagement of the community of intervention.

The communities were identified based on their geographical locations – one urban and one rural location with an absence of repairing shops for digital gadgets within a 2-4 km radius of the communities. We directly reached and engaged with about 60 participants through 5 repair workshops and through the door-to-door campaigns and e-waste drive we reached close to 30



households in the two locations.

The positive response from the small number of people that the pilot was able to reach in just 3 months has allowed the DGP team to create optimistic goals of reaching a wider audience in the two locations and replicating the program across more locations in the future.

Activity: Setting up repair café & Identification and onboarding of the repair café team and resource persons

The repair cafés are manned by one digital entrepreneur who is a local person. They are responsible for managing and handling the affairs of the repair cafés along with one resource person as the “expert repairer” with in-depth knowledge and existing skill-sets for repairing electronic gadgets such as mobile phones, laptops or tabs etc. They are responsible for awareness and knowledge dissemination during workshops and campaigns, as well as conducting training on repairing activities and provide affordable repairing services in the community on a regular basis. Moreover, the centres have been manned with state-of-the-art equipment and tools that can be used by the expert repairer as well as the participants during participatory repairing workshops.



This activity has faced and is facing the most issue. In both the locations, it has been a problem to find a resource person with the requisite skill sets, technical knowledge as well as the willingness to commit to the program for a long-run. However, in Chanchalguda, such a person joined the team after a lot of effort. In Nuh, the team is still looking for a resource person to join the program on a long-term basis.

Activity: Repair activities and workshops with community beneficiaries & Community outreach, visibility, promotion and engagement in the project repair and management activities.

The need assessment highlighted a lack of understanding amongst the community members about the importance of repairing and reuse, as well as the production and implications of e-waste and its relation to environmental degradation and sustainability. Moreover, it was found that there was an absence of repairing shops within the 2-4 km radius of the communities in Nuh and Chanchalguda respectively where the repair café was set up in both the locations. The repairing shops in Chanchalguda only deals with mobile, tab and computer hardware repairing. Whereas the repairing shops in Nuh only deals with mobile hardware repairing.



In both locations, there are no nearby repairing shops that deals with electronic products such as Television, as well as those that provides services in dealing with software issues. In Chanchalguda, while the repairers did not specify any safety measure that they adhere to while repairing a digital device, they did mention using microscope to repair small and delicate parts with precision. On the other hand, in Nuh, the repairers mentioned the usage of multimeters, gloves and safety glasses while performing repairing activities.

Moreover, none of the repairers specified any standard procedure for disposal of the digital devices, they nevertheless mentioned that the standard practice is to sell the devices. Based on the results of the need assessment, it was decided by the DGP teams of two locations that there is a need for community mobilization around the cause through a mixed method of awareness generation which was based on both theory and practice. Consequently, 5 workshops on 5 different topics as prepared by the digital entrepreneurs and expert repairers based on the community's demand for repairing activities and 1 "E-Waste Collection Drive" were scheduled.

In Chanchalguda, the workshops were organised on: 1) Repairing Mobile Phone Damaged by Water; 2) Repairing Hard Disk (PC); 3) Repairing and Changing Printed Circuit Boards; 4) Repairing Different Types of Mobile Batteries and Chargers; 5) Repair Workshop on Different Hardware Parts and Software Issues.




In Nuh, the workshops were organised on: 1) Different types of Physical Damage and Its Repairing (Mobile Phones); 2) Liquid Damage and Its Repairing (Mobile Phones); 3) Technical Damage and Its Repairing; 4) Mobile Care; 5) Software Issues and Its Repairing.

The workshops and the outreach attempts through the campaign and drive were well received by the participants and the community in general. The participants have expressed interest in more participatory workshops and skill training to learn repairing primarily to save money and participate in community initiatives aimed at



environmental sustainability and justice rooted in the philosophy of circular economy. Elders in the community have shown deep interest to learn more about the initiative and asked if they can be included in various ways.



Based on the positive changes in perspective after the outreach initiatives, the program can be taken forward to build an environmentally conscious community with eco-conscious behaviour and practices. With the help of experts and more collaborative efforts, the program can engender skills required to be self-sustainable; create channels of affordable repair and reuse; safe disposal of e-waste etc. Moreover, the program aims build wider collaborations both locally and internationally based on the learnings of the program.

V. TARGETED BENEFICIARIES

The Digital Green Prakriya pilot program was set-up and implemented in one urban location in the Chanchalguda district in Hyderabad, Telangana and in one rural location in the Nuh district in Haryana. The pilot was designed with the aim of creating low-cost repair infrastructure for electronic and digital goods, creating a knowledge and skill training hub and trying a model of inclusive circular economy entrepreneurship with focus on gender equality. One local person was selected in each of the locations to manage and handle the repair cafés as digital entrepreneur along with one resource person as the “expert repairer” with in-depth knowledge and existing skill-sets for repairing electronic gadgets such as mobile phones, laptops or tabs etc. While the digital entrepreneurs are responsible for managing, organising and handling the affairs of the repair café, the expert repairers are responsible for awareness and knowledge dissemination during workshops and campaigns, as well as conducting training on repairing activities and provide affordable repairing services in the community on a regular basis.

The secondary beneficiaries include the rest of the community in totality. The participants for the workshop were mobilized through the existing DEF programs. WhatsApp groups especially were relied upon where youth and parents were informed about the workshops through flyers and posters. The repair café teams also did a door-to-door campaign with flyers and posters to raise awareness about the importance of repair, recycle and reuse to mobilize people from all ages and gender to join the workshop. Through the 5 workshops, about 60 participants were reached in the two locations with an average 75% male and 25% female participants. The age-group of the participants was between 15-55 years, with more than 70% of the participants between 15-21 years of age. Further, through the door-to-door campaign and e-waste drive, the DGP team was able to reach out to at least 30 households in both the locations.

Metrics	Outcome
Awareness & Knowledge Level	
Importance of Repair, Recycle, Reuse	3% increase in the number of people changing their perspective with more focus on long-term use value of electronic/digital products when buying.
	92% of the participants said that they discussed about the importance of repairing and reuse with their family and friends.
Understanding of E-waste	98% increase in the number of people who understand the concept of e-waste.

	1% increase in the number of people who believe e-waste is harmful for ecology of a given place.
	1% decrease in the number of people who believe e-waste is less harmful than other forms of waste such as plastic.
	2% decrease in the number of people who don't believe e-waste is harmful for the environment and living beings within that environment.
Understanding of Circular Economy	94% people during the post-assessment survey were found to understand the concept of circular economy.
Expected Change in Practice	
Sell to Scrap Dealer	1% decrease in the number of people who said selling their discarded devices to the scrap dealer is a viable option.
Throw in Dustbin	No Change in the number of people who said they discard their e-waste by throwing it in the dustbin.
Give for Reuse	7% increase in the number of people who said giving away or selling their discarded device for reuse is a viable option.
Formally Sell	2% increase in the number of people who think formally selling their discarded device is a viable option.
Informally Sell	1% increase in the number of people who think informally selling their discarded device is a viable option.
Buy, Not Repair	1% decrease in the number of people who are more leaned towards buying instead of repairing and reuse.
Repair, Not Buy	1% increase in the number of people who want to learn basic repairing skills.

VI. CHALLENGES

The pilot faced key challenges, especially when it came to finding a resource person/expert repairer who was willing to take the responsibilities of the repair café and give adequate time to prepare the workshops and deliver on them, as well as take part in the e-waste drive. However, in Chanchalguda, the expert repairer agreed to be part of the repair café on a long-term basis as a part of the self-financing model by providing affordable repairing services to the community members and participating in other activities for DGP. But for the repair café in Nuh, the team has not been able to find an expert repairer on a long-term basis who would provide affordable repairing services to the community. The primary reason for this is that people from the community who possess the required skills at present already have their own shops or other employment opportunities and they are not willing to join the centre out of rational and economic reasons i.e., the profits from providing affordable repairing services might not suffice for them to sustain in the long-run.

However, the project has achieved the goal of community mobilisation and starting a dialogue around the circular economy in the communities. The participatory nature of the workshops has further instilled an interest among the youth to learn the skills for repairing their own devices. The project team is not keen to change anything about the program but take it forward with a focus on providing a space for the youth and others to not just attain the repairing skills but become leaders and voices for environmental sustainability and justice in their communities and take up initiatives to deliver on the cause like organising and participating in community repair workshops and e-waste collection drives etc. Moreover, the team envisions the program to create sustainable ways to collect, recycle and dispose of e-waste by collaborating with organisations with formal and safe channels to do the same.

VII. RELEVANCE OF DGP


The program is relevant in the communities because the issue is deeply prevalent in the two locations. The knowledge and awareness on issues related to e-waste, as well as a repairing culture has been heavily absent due to which when the concept of circular digital economy was introduced which was followed by the various workshops, the participants took great interest. The program will not only help bring cultural and behavioural change in the communities but also allow for the creation of avenues for further initiatives for environmental sustainability and justice. The program can thus enable truly eco-conscious communities to emerge and thrive.



The outreach efforts have enabled a change in the levels of awareness as well as a change in attitudes and behaviour. More and more people want to participate in activities that aim to engender a repairing culture in the communities. A conversation with the DGP expert repairer (Mr Rizwan) in Chanchalguda highlights the eagerness of the youth to learn more about the various technical topics introduced through the workshops. Mr. Rizwan said *"After every workshop, the students eagerly asked and enquired about the tools and repair procedures. The students are ready to learn the repair process to avoid E-waste in the community. In all the workshops, everyone actively participated and learnt about E-waste management. After workshops, some [people] approached our repair café to repair electronic device and [have] taken advice for repair or replace the device."*

Moreover, in Chanchalguda, after the e-waste drive, community members are visiting the DGP centre and enquire about their devices. Some people are also coming to get their electronic and digital devices like mobile, laptops and TV – repaired. People are increasingly coming to take advice about their devices.





Further, the Digital Green Prakriya model can easily be replicated by other organisations who are aiming to target such a sensitive aspect of environmental care and manage the impacts of technology towards positive change through engendering practical eco-conscious behaviour and collective awareness regarding the socio-economic responsibility towards the environment, animals and to each other. The program is based on a self-sustaining entrepreneurial model which will not just deliver on the social and environmental cause but also aims at creating economic sustainability and at the same time promote a repairing culture as opposed to a disposal culture, with collective efforts at e-waste management. In India, organisations like the Council for Social and Digital Development (CSDD) have not just been active knowledge and consultant partners in the project but also aiming at replicating the model in the North Eastern region of India.

VIII. TAKING THE CAUSE FORWARD

The program through its outreach efforts via door-to-door campaigning, e-waste collection drive and participatory workshops on repair, reuse and recycle of digital gadgets – have enabled generating a process of continuous dialogue around the issue which has led to positive social and behavioural outcomes. Not just the youth, but the elderly in the communities have shown a great interest to learn more about environmental sustainability and justice, as well as the implications of e-waste and how to manage them.

After the intervention, majority of the female (47%) and male (76%) participants agree that buying a new device for long-term use only is more sustainable. Pre-intervention 78% of the participants said that knowing basic repairing is important. This number jumped to 100% of the participants saying that knowing basic repairing is important during the post-intervention survey. 62% of the participants want to learn basic repairing to “save money”, as compared to 60% of the participants who want to “help others”, another 60% want to “contribute in reducing e-waste” and 35% saying that they want to be “self-reliant”. Moreover, after the intervention, 92% of the participants said that they discussed about the importance of repairing and reuse with their family and friends. 7% more participants share the belief now that finding ways to repair and reuse of their old devices is a more sustainable option. To that end, 100% of the participants informed that they are willing to learn repairing skills through training workshops in the future. Even though we reached about 60 participants in the two locations, but based on the response the DGP teams received from the community in general, the number of people interested in joining the community initiative can increase to a great extent which will allow the team to reach more households and engender a truly eco-conscious community.

However, the program kickstarted its activities pertaining to “income generation” through an entrepreneurial model where it aims to create a low-cost repairing infrastructure in the community in Chanchalguda only in December. Consequently, the economic outcomes of the program are yet to be seen. A longer observation of the impacts of the eco-conscious behavioural change on the spending and saving habits in the community is also required.

Moreover, the program was designed and implemented in line with Government of India’s draft policy on [Circular Economy in Electrical and Electronic Sector](#). DGP can be seen as an extension of DEF’s active participation in the policy process through consultation and contribution in the form of advocacy reports and policy suggestions for the draft’s improvement. DEF is taking part in the policy’s adoption as well as its implementation on the ground through innovative approaches and aims to urgently work on the issue at hand.



One of the core programmatic focuses of DEF is digital environmental justice with sustainable, accountable and responsible use of digital devices and technology for social cause with environmental and climatic safeguards. Along with APC and other national and international partners, DEF has been focusing on circular economy in electrical and electronic wastes in India and Global South. DEF has been a core organisation in engaging the Ministry of Electronics & IT in India in strengthening the draft policy on circular economy (published in 2021) and submitted critical recommendations and civil society inputs.

In 2023, DEF plans to set up another 4 Digital Green Prakriya (DGP) Centres / Repair Cafes in 4 major locations in the country at community level, to carry forward the cause of circular economy and digital environmental justice.

The outcome of this pilot project is coming in handy and critical to fine tune approaches and strategies to put key factors together for the above. One key outcome has been increased awareness, understanding and interest in the community to the subject and priorities of circular economy in digital devices sector for greater social, economic and environmental goods.

With this project intervention, DEF has already reached out to key organisation in India working in this space, KARO SAMBHAV (<https://www.karosambhav.com/>), an established name and globally recognised, to work jointly on community level repair and reuse facilities and promote culture relevant to this. DEF will continue to seek inputs, guidance and engagement with APC on this subject, as India is second most e-waste producer and importer of digital devices globally.
