Communities of Making

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A Visual Exploration of Rural Makerspaces in India

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This pictorial seeks to capture both the tangible and intangible aspects of site visits to Makerspaces situated in rural India. While over twenty-five Makerspaces across four regions were documented through conversational interviews, photography, sketching and reflective writing for the project, only a small selection of this wealth of visual and factual information, with a particular focus on rural locations, has been compiled in this pictorial. It provides a rich tapestry of Indian maker cultures, their contribution to local communities, and how these spaces interpret their role as facilitators of creation within the complex global narratives of sustainability.

Keywords: Maker Cultures; Sustainability; Community Engagement; Digital Making; Materiality.

1 Introduction

Over the last decade, large populations and the presence of institutional and industrial partners with a vested interest in a technologically savvy workforce, have facilitated the establishment of local maker cultures in urban environments (Galaleldin et al., 2016; Van Holm, 2015; van Holm, 2017; Menichinelli et al., 2017; Toombs et al. 2015). These are often centred around community production facilities where digital fabrication methodologies meet more traditional, physical ways of making, and are variously referred to as Fablabs, Makerspaces and Hackerspaces. The ethos of the maker movement has projected a powerful, utopian narrative of facilitating STEAM learning and making for all strata of society, regardless of differences in skill, age, gender, wealth or educational attainment since its inception (Gershenfeld, 2005; Anderson, 2012; Troxler, 2013; Bosqué, 2013). However, an increasingly critical discourse centred around the institutionalisation and commercialisation of 'authentic' maker cultures, the co-opting of technological innovation by large corporations, and the long-term financial viability of Makerspaces has called into question such heroic ideologies in the Western world (Morgan et al., 2014; Troxler&Maxigas, 2014; Bianchini et al., 2018).

It is therefore, perhaps, timely to turn towards the Global South to explore how the maker movement has been interpreted in its regions according to different cultural, social and geographical contexts. India in particular offers an advantageous setting for this kind of investigation, with a highly active, autonomous maker culture. Its epicentres, such as Mumbai, New Delhi and Bangalore, are home to many well-established and prolific Makerspaces. These exist as independent endeavours as well as within institutional and industrial settings. Furthermore, the cultural foundations of India's strong traditions of artisanal craftsmanship and their historical connections to the Swadeshi movement (McGowan, 2009; Wood, 2011) resonate strongly with the values espoused by the global maker movement. This is particularly true of the idea of

reviving economic fortune through self-sufficiency and self-reliance as well as recognising the importance of mentorship. These ideological tenets are also expressed through the growing proliferation of startup culture in contemporary India (Korreck, 2019; Chaudhari&Sinha, 2021), driven significantly by its increasing numbers of engineering and design graduates. The incubators and co-working spaces of these startups are often based in local Makerspaces, some of which are specifically geared towards providing support to these business endeavours in their early, most vulnerable stages.

1.1 The Maker Mela

No account of Indian maker culture could be complete without mentioning the annual ***Maker Mela*** gathering that takes place on the campus of Somaiya Vidyavihar University in Eastern Mumbai in early January. The four-day event offers an opportunity for makers, innovators and influencers from all over India to present their outcomes to a critical but receptive audience. Sponsored places to participate in the Maker Mela exposition are available to those makers who could benefit from the financial advantage, and there are organised pitching sessions for startups to meet angel investors. For the purpose of the Maker Mela, the definition of 'making' as an activity is cast broadly, and thus more closely aligned to the views held by Dougherty (2012) that can include all types of 'making', be they artistic, educational, utilitarian or culinary, with or without employing technological means. During our visit to the Maker Mela gathering in 2020, this was borne out by audience numbers as well as observable diversity in terms of the types of creative endeavours on display.

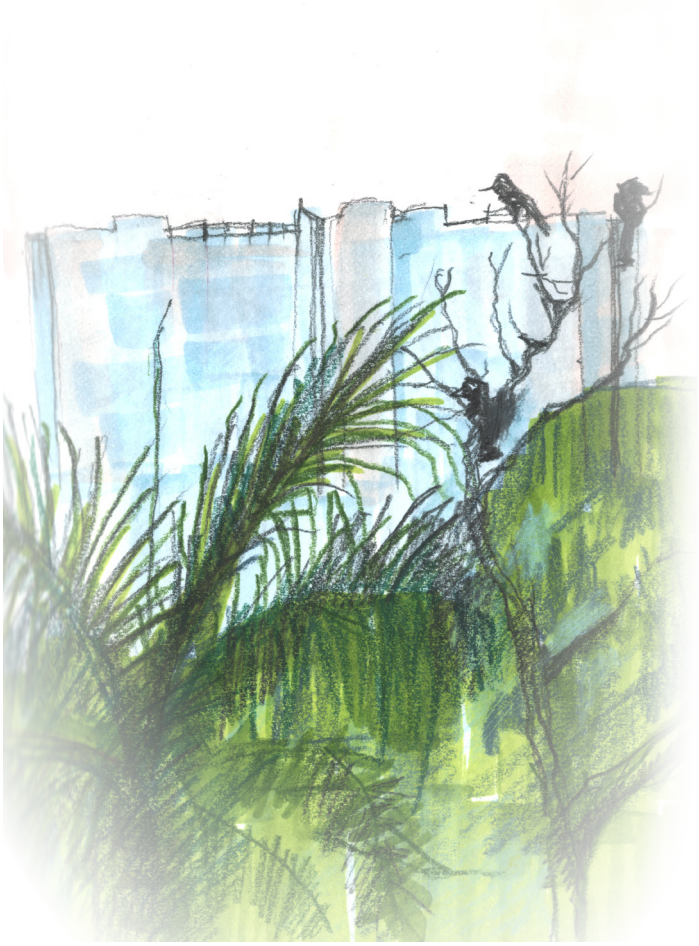
1.2 Notes on Methodology

The home of one of the five 'Proto-Fablabs' (Gershenfeld, 2005), India has a proliferation of rural Makerspaces, many of which are exceedingly remote, but closely tied into local communities through agendas of social and environmental sustainability. The assertion by Taylor et al. (2016) that Makerspaces act like "public resources dedicated to creativity, learning and openness" is amplified when the spaces themselves are far removed from large population centres. This pictorial aims to demonstrate how these remote, rural Makerspaces provide the most fascinating insights into how they are used by the communities that surround them.

The images featuerd in this pictorial were taken by the author during a three-week scoping trip to Indian Makerspaces in four regions: Maharashtra, Karnataka, Haryana and the Punjab. Overall, more than 25 spaces were visited, and the ones featured in this pictorial only represent a small selection of a much more extensive body of work. The primary aim of the project was not only to document the spaces, but also to evaluate their contribution to Indian maker culture in terms of promoting sustainability in all its facets. A secondary aim was to explore whether connections exist between the individual spaces and the extent to which they perceived themselves as belonging to a wider network of sustainable maker culture within India. Of particular interest in this respect is the hypothesis that former members of rural Makerspaces play an important role in promoting an ethos of sustainability and local mentorship to other regions of India through establishing Makerspaces of their own.

Rather than conduct formally structured interviews, the diverse nature of the locations and their users required a more conversational approach as suggested by Longhurst (2003) and Robson&McCartan (2016). These conversations were captured in the form of digital audio recordings and notes, which were used in conjunction with information provided in the digital repositories of the Makerspaces to create a more holistic narrative that accurately reflects the activities undertaken by each space. The author was aware of the difficulties involved in capturing the essence of a Makerspace during a relatively brief visit, where little or no activity might be taking place at any given time (Kothala&Bosqué, 2014). In response to these limitations, the author's photographs intend to capture the distinctive features of their built and natural environments. This was supplemented by drawings and reflective prose to capture the author's personal impressions of events surrounding the site visits. Although this is an unconventional approach to investigating Makerspaces, which have more often been examined through the lens of established design ethnographic methodologies, the author hopes that the overall visual narrative created by this pictorial contributes a different point of view rooted in artistic practice and vividly captures the unique atmosphere and distinctive characteristics of each featuerd Makerspace.

2 The journey to Pune



Leaving the sunken concrete jungle of Mumbai behind in the golden sunlight of dawn, we set out on the journey to Pune. The streets are bustling with workers, school children and drivers going about their daily routine. Vendors in makeshift tents made of blue plastic tarpaulins sell their foods to the hungry punters streaming past on the dusty roadside. Small alleyways beckon enticingly - their labyrinthine geographies only known to those who have lived there for generations. The car is soon filled with the fumy stench of morning traffic and it is another hour before the urban skyline first gives way to a vast expanse of water, spanned by the Vashi bridge. Through the sprawling high-rise suburbs, the Mumbai highway snakes into the mountains, its ever-steepening incline flanked with terraces of lush, emerald foliage. Monkeys lounge lazily on the walls of the Khalapur Toll gate. After another hour and a half we finally reach our destination deep in the Maharashtra countryside.

Figure 1. The main building of the Vigyan Ahram in Pabal contains office space, a CAD design suite, a digital sewing studio and a chemistry laboratory.

Figure 2. The Vigyan Ashram "Do-It-Yourself Lab" satellite complex in the Kothrud district of Pune. The series of interconnected geodesic domes of the main building are reminiscent of those seen in the grounds of the Pabal site and host different workshop areas. They are surrounded by a ***largely wild garden compound designated for experimental agricultural projects, such as the solar bread oven visible on the left of the image.***

Figure 3. The digital fabrication pod of the "Do-It-Yourself Lab" in Pune.

2.1 The Vigyan Ashram, Pabal & Pune

Amongst members of Indian maker culture, the Vigyan Ashram is perceived to be the rural proto-Makerspace and is often jokingly referred to as "FabLab 0". Its long history began with its foundation in 1983 by Dr S.S. Kalbag as **a space for introducing practice-led educational methodologies based on scientifc theory to rural populations.** It was documented extensively by Gershenfeld (2005), who selected it to be the site of the first Fablabs to be established outside of the US and has continued to operate and evolve successfully even after the death of its founder in 2003. Its huge main compound in the small hamlet of Pabal is supplemented by the more modest "Do-It-Yourself Lab" satellite complex in nearby Pune, the second largest metropolitan city within the state of Maharashtra. Here, the availability of equipment such as laser cutters and 3D printers allows registered members to experiment freely and work on individual projects, as well as to participate in organised workshop.

Figures 4&5. Surrounded by an encroaching urban landscape of concrete carcasses, ***the well-kept vegetable garden is a site of hydroponic experimentation as well as relaxation.*** *The main building of the Creator's Catalyst used to house a* ***cement and tiles factory.*** *The old well is still being used as part of the Ceramics studio.*

2.2 Creator's Catalyst, Pune

The Creator's Catalyst Makerspace, in the Yewalewani area of Pune, is loctaed in an industrial district on the southern outskirts of the city. It is a relatively new venture, having only come to fruition in 2017, when siblings Siddharth and Shalu Sancheti took over the disused cement and tiles factory run previously by their father. From an engineering and architecture background, they decided to bring digital making facilites to Pune after Siddharth finished his Masters degree in Germany. Believing in the true spirit of the Maker Movement, **the siblings renovated and adapted the building themselves, using local materials. Their membership grows predominately through word-of-mouth as the concept of Makerspaces is still largely unknown amogst local communities.**

Figure 6. The garden of the Creator's Catalyst borders onto an ***itinerant colony of seasonal workers, who have been invited to grow their own food there. Growing vegeatbles to teach agricultural techniques is the garden's main purpose, but renewable materials for projects, such as Bamboo canes, are also grown here.***

*Figure 7. The Design Studio space within the main workshop of the Creator's Catalyst. Principles of sustainability guide every aspect of the compound's design, including **social sustainability**. The open spaces within the main building are intended to foster **collaboration, learning and community**.*

Figure 8. A workbench adorned with iconographic religious images in the Metal Studio.

3. Storytelling in Bangalore

We arrive in Bangalore at night and are instantly hit by a blast of humid heat when we leave the airport. Enveloped by lush, tropical vegetation, Bangalore feels more intimate and oddly familiar to this European than the heaving, fume-filled metropolis of Mumbai.

Just as the sun is setting, we meet at the entrance of the Renuka Yellama Devi Temple. Following the procession through the elaborate gates into the courtyard, we witness the storytellers' ceremonial singing and dancing. Afterwards we disperse into the nearby gathering space and listen to their stories deep into the night, crushed yellow flower petals sticking to the soles of our feet.

Figure 9. The entrance to the IruWay Farm compound near Tumakuru.

3.1 IruWay: Bengaluru & Tumakuru

Nestled deep in the countryside by the foothills of Devarayandurga inside the HaLekote (old fort) hamlet, the **IruWay farm compound brings together traditional crafts and technology in a rural setting.** Supported by Bangalore-based technology collective Janastu, IruWay features the Crafter Space which provides an **opportunity for local communities of women and youths to make a living and develop lasting craft skills that are made commercially viable through the application of digital technologies in conjucntion with local materials.** The annual *AnthillHacks Festival* held at Iruway, the *COWMesh* wirelss network and the *Jaaga* living-working space are only some of the many community-led initiatives that Janastu have been involved in since their beginnings as Servelots in 1999.

Figure 10. The Jaaga living-working space. Made entirely from pallet racks,the structure houses accomodation for urban hackers who want to visit the farm as well as a small digital making and electronics lab on the upper level.

Figure 11. The large Gazebo serves as a ***communal area where annual events such as the AnthillHacks Festival are hosted****. Components from the Namma Halli Radio Community Wifimesh Radio are distributed on woven mats on the floor, ready to be assembled.*

Figure 12. The CrafterSpace is located at the very entrance of the compound. ***It defines itself as a "Craft Cluster", an initiative developed by Yanatsu in partnership with MITAN, that enables the practical application of technological methodologies to renew craft skills and empower local artisans to collaboratively and autonomously manage their economic activities with the aid of digital technologies.***

Figure 13. The inside of the CrafterSpace. ***Traditional craft techniques such as braiding, weaving, sewing and basketry are enhanced and refined through employing digital making technologies such as laser cutting and 3D printing. This embodies the philosophy of the CrafterSpace to "make sustainable connections between local people, locally available materials and tools, and required techniques and technologies."***

3.2 Project Defy, Bengaluru & Kaggalipura

With its main offices situated in Bangalore, Project Defy supports a network of self-learning spaces it terms "Nooks", located throughout India. While most are within the Karnataka region, some can be found as far afield as the Punjab, with three new international "Nook Hubs" having recently also been established in Africa. **Nooks are initiated and run by the communities in which they are situated. After an initial period of twelve months, during which local participants are supported with all aspects of setting up and running a self-learning space by the more experienced Project Defy team, the Nook is handed over to the community, to be operated entirely autonomously henceforth, while always remaining a part of the Project Defy Network.** The Nook depicted in this pictorial is situated in the small village of Kaggalipura, some 15km outside of Bangalore. Despite its modest outward appearance, it nevertheless provides facilities for **both digital and physical making practices, as well as a small outside growing space.**

Figure 14. The Kaggalipura "Nook" of Project Defy operates a strict "No Shoes" policy.

Figure 15. The entrance of the Kaggalipura Makerspace blends into its suburban surroundings. More than just a self-learning space, the Nook has become a ***safe haven for young, largely unemployed, users to experience being part of a community of makers. The space features a small kitchen for culinary experimentation as well as some bunk beds for relaxation, catering for the many users who bring their children to the Nook.***

Figure 16. The main area of the Kaggalipura Makerspace houses CAD facilities, while adjacent rooms contain a wood and metal workshop, a sewing room and an electronics lab. ***Many regular users of the space are young mothers, who hope to gain practical skills in order to make themselves more employable.***

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