

RESEARCH

Plastic Mut(e)ability: Limited Promises of Plasticity

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Plastics are supposed to be infinitely mutable. Yet the enduring legacies of plastic waste and its derivatives persist to tell a different tale. In this paper, based on empirical data from a rapidly urbanising village in Rajasthan, western India, we take the reader into the unfolding 'social life' of plastic (im)mutabilities. In tracing plastic's complicity in configuring new objects, subject-object relations, markets, ensuing socio-economic hierarchies, and the ecological, biological and ethical traces of plastic waste, we present the picture of a plasticised socio-material realm. Here old socio-economic hegemonies and forms of violence are re-entrenched and new relations of deprivation and dependence forged in plastic, linked to wider (capitalist) processes of resource extraction, and abandonment. Therefore, we situate plastic's multiple (im)mutabilities within an unfolding story of new openings, closures and mutations across scale, inflected by the complex legacies of caste, gender, race and region. Finally, the notion of plastic mut(e)abilities is developed to include occasions of productive hacks and crafts with plastic 'waste'—ongoing plastic mutabilities—by a marginalised woman which allude to limited possibilities of socio-material change. This helps recover some of the promises of plastic co-produced at the delicate margins and the liminal spaces of a plasticised society.

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Introduction

The framing of plastic in present-day public knowledge has been dominated either by the spectacle of 'plastic pollution' or by deserving attention heightened around plastic 'waste' (McKay et al. 2020). Yet 'plastic' is but an umbrella term for a vast conglomerate of synthetic materials (henceforth, plastics; in plural) with wide-ranging physical, chemical properties, sources and trajectories. As Roberts (2010), Hawkins et al. (2015), Liboiron (2016; 2021), Henderson and Green (2020), Pathak (2020), Altman (2021), and Dey and Michael (2021; 2021), among others, have demonstrated, plastics are embedded in multiple nexuses of relations, that range from the socio-cultural, economic, political and ethical, to the physical, bio-ecological and the material. Critical and careful attention into these relations, as the above authors argue, helps ground the polemic in actionable terms, and may enable a fuller reckoning of the emergent complexities of plastics in the world. Indeed, plastics do not only confound and perturb technoscientific standards of measuring ecological toxicity and harm, but also exceed socio-cultural and economic description. Other authors (including (Hawkins 2001; Drazin & Küchler 2015; McKay & Perez 2018; Pathak 2020)) also draw attention to plastic's material variety, and vitality (Bennett 2010), as these substances transgress

the porous boundary between bodies, subjectivities, valued sites (say, of desirability and undesirability, purity and pollution (Douglas 2002 [1966])), and economic regimes (say, commodity and waste—as matter devoid of value, durability and transience (Thompson 2017)).

As synthetic substances facilitating product design, plastics have been the preferred materials for post-War innovation and production at scale (Bensaude Vincent 2013), while plastic materialities have routinely tricked the promises of waste management and smart tech-fixes of containment (MacBride 2013; Dey and Michael 2021). Today, plastics are supposed to be everywhere (Subramanian 2021). They are integral to industry, infrastructures, and markets across the world and socio-economically embedded—albeit unevenly, yet also entangled and enmeshed in bodies and ecologies (not least as waste escaped). Plastics are themselves emergent in complex forms as they bring together heterogeneous molecules and species, generating new sociomaterialities (Gabrys 2013). This presents a methodological challenge for researchers and stakeholders in policy and action in that the very object of mediation is multiple and contested, mutable and elusive. Plastics truly typify a 'topological' understanding of materiality, where, after Michael and Rosengarten (2012), 'myriad entities and valuing regimes...become connected in the multidirectional enactments' of plastic matter (Hawkins 2013: 51). By 'assembling' a wide-ranging nexus of heterogenous relations, plastics craft (im)possibilities that transgress boundaries and scales, mediating familiar

objects and categories (e.g., waste-value, pure-polluted, global-local) which are mangled and re-enacted in new knots and configurations.

For instance, Hawkins (2013) demonstrates how polythene terephthalate (PET), a type of plastic, not only blurs the boundaries between commodity and waste, but shapes these value relations differently at specific sites and experiences of the 'global'. Indeed, PET bottles are shown to enact portable drinking cultures in a fast-paced, modern and globalised world. However, they derive value precisely on the premise that the object may be 'wasted' once its contents have been consumed. That is, the valued character of disposability is imbibed within the product directly at the stages of design and manufacture. So-called waste 'externalities', Hawkins shows, are included firmly *within* the capitalist logics and practices of commodity production and accumulation of value. Furthermore, Hawkins et al. (2015) take us to the plastic recycling villages in Vietnam (where shipments of thrown-away PET bottles eventually end up). The authors show us how plastic's materiality, which once enacted profitably disposable products, impedes efforts of revaluation and recycling at these already-marginalised sites. The labour and burden of material salvage and the socio-ecological vulnerabilities of plastic pollution are thus outsourced, unevenly distributed in a wider network of profit accumulation and abandonment which re-produces the 'global'. Similarly, Liboiron's new critique (2021) elaborates how plastic waste export and ubiquity produces and stabilises global inequities, as does Knowles map the patchy backroads of plastic-made flip-flops (Knowles, 2014). In other sites, plastics may co-produce further possibilities. Gill (2009), Reno (2009) and Millar (2018), for example, offer compelling accounts how the onward lives of materials generate significant opportunities for socio-political change in marginalised communities, including partially mediating and inflecting persistent social legacies (say, of caste). It would, therefore, appear that despite abstracted claims of universality or 'global' objectivity, plastics are multiple, emerging in particular ways within specific contexts (Gabrys et al. 2013; McKay et al. 2020).

As study methods based on pre-conceived ontologies get fundamentally challenged by plastics, we turn to post-humanist approaches to materiality and process (e.g. see (Braun & Whatmore 2010; Gregson & Crang 2010; Barry 2013; Bensaude Vincent 2013)) in order to map the more granular relationalities and differential emergences of plastic *and* 'society'. In taking cues from Gabrys et al. (2013), this paper supports a move toward immanent ontologies of plastic, as emergent around specific occasions of mediation. After all, in order to know or mediate plastics, they need to be grappled with in their specificity, within particular material and social contexts, times, places, and environments. Yet, we are acutely aware of the multi-actor, multi-scale and multi-sited nature of plastics and the localised yet globalised violence embedded within recombinant material and social assemblages.

We ground and attune our analysis in a village in Rajasthan, which we shall call Jajpur henceforth, where plastic capitalism has proliferated massively in the past two decades

following the first round of liberalisation and globalisation of the Indian economy. We elaborate on ways in which plastic packaging enacts markets, practices, and socio-economic hierarchies in this place, while also being involved in the muting of existing practices, material cultures, and industries and the entrenching of local hegemonies and legacies of oppression. We attend to the accumulation of discarded packaging in the commons of Jajpur, and follow plastic waste as it raises different kinds of crises, and limited opportunities for the local population. In particular, we consider lesser known cultures and practices of plastic waste removal and onward mediation by marginalised Dalit women, and attune our focus to one who recovers some of this waste and redeploys them privately on occasions of productive reuse.

This is an empirical setting which involves multiple scales and processes of plastic flow (including trans-national and trans-regional influx of pre-packaged commodities), localised micro-flows and multiple points of stagnation and mediation, mutability and immutability co-produced with plastics. It offers richly 'plasticised' grounds for socio-material analysis across scale. Conceptually, we subject plastic's plasticity, i.e., its supposed ability to mutate and manifest in multiple forms, to critical and care-ful analysis. While plastic's mutability has been studied to devise new objects and capitalist markets, here we explore further combinations, productions and (im)possibilities. Plastic's (im)mutability is contextualised as it e-merges within a complex dynamic of material and social mutations, but also immutabilities (say, durable plastic waste or stable social hegemonies) and mutings (marginalisation, erasure, exploitation, restriction). The limited occasions of plastic reuse and repurposing (onward mutabilities of 'waste') offer grounds to visibilise more backgrounded material knowledges, processes, labours and skills: Muted assertions of agency and co-productive ingenuity we call plastic mut(e)abilities. While plastic mut(e)ability complicates subaltern representation of abandonment and suffering by shedding light on remaindered agencies, we also show how these processes are crafted at the margins of a globalised local. In this sense, we echo Isenhour and Reno, who, in an earlier issue of this journal, alert readers to how mundane private practices of material recovery, repair, and reuse may still be 'embedded within larger political and economic structures of capitalist accumulation and abandonment' (2019: 1). The article thus performs a situated yet multi-scalar critique of the promises of plastics in light of its production of material, gendered, socio-economic, spatio-regional, and ecological differences.

The 'Social Life' of Jajpur

As a trained engineer in 'sustainable development', I was invited to Jajpur in 2015 to advise a local grassroots activist group, convened by an environmentalist who was a friend of a common friend. The group mobilised public opinion against plastic use and wanted to understand techniques for managing plastic waste. This was in the backdrop of massive quantities of plastic discards accumulating in the rural commons. It not only raised an aesthetic problem but produced a technical and ethical-environmental crisis

too; evident from plastic waste clogging irrigation canals and being occasionally ingested by the roaming cattle leading to premature death. Less than 30 km away from Jodhpur—the nearest urban centre—and lying on either side of a newly expanded state highway, Jajpur emerged in the new millennium as a market for fast-moving consumer goods. Following the economic liberalisation of India in 1991, and a near-simultaneous promotion of indigenous petrochemical industries (Gill 2009), plastic-enabled capitalism made its presence felt. Retail commerce became prominent as the local population depended on the rising number of grocery stores to source essential commodities. However, the place had ‘no system at all’, I was told, to deal with plastic waste—a recalcitrant material relatively new to the village ecology. “Plastic is a *jiddi* (stubborn) object,” one village elder told me, “that which the soil does not assimilate, the desert air does not evaporate, and god forbid, the sacred *gau mata* (holy cattle) must not ingest!” Clearly, plastic’s materiality—its stubbornness—stood out, resisting traditional more-than-human infrastructures of labour and techniques which imbibed other discards—food waste, farm stubble, animal dung, human bodily refuses, etc. Unlike these materials which became part of a natural cycle and eventually ‘gave back’, e.g., vegetable peels were routinely composted to make soil fertilisers, plastics would not yield. They resisted degradation; they persisted, and plastic waste accumulated over time.

I visited Jajpur several times during that year, observing and conducting interviews (prior to a formal professional shift into academic anthropology), trying to understand how plastics entered the village—through what channels, and to identify sites of use and waste accumulation. It soon became apparent that the community did have a ‘system’ of plastic waste removal in place. However, this appeared to be a selective arrangement with restricted access and limited scope for the public good. During one of my walks down the main village, I came across 60-year-old Jijibai. A thin lady of strong build, tanned dark in the afternoon sun, I found her sequestering plastic waste by hand from the nearby farmland of a local *mahajan* (a landowner, typically belonging to one of the upper castes), moving them on to the public roadside and setting fire to the small plastic pile. My initial alarm at the sight of open plastic burning led me to start a conversation. It turned out that Jijibai was, in practice, part of a rudimentary arrangement of lower caste gendered labour privately employed to remove plastic waste. She was put to work by the more affluent residents of the village to clean the outdoor spaces of the latter’s farms, households, fields, the surroundings of local shops, and other private sites where plastic waste was likely to accumulate. Jijibai was offered tokenistic remuneration in kind—food leftovers, grains, and other household refuse like unused utensils, clothes, wood, etc. Jijibai spoke of two more local Dalit (traditional social outcasts) women who did a similar job of removing plastic waste from the *mahajan* farmlands and ran mundane errands against nominal remuneration. Jajpur was not a socio-economically homogeneous place, and plastic’s uneven spatial occurrence and selective removal practices highlighted some of the localised

forms of enacting power and difference in body, society, and space. Indeed, richer and sociologically powerful households could draw on caste-class-gender privileges and get their ‘private’ spaces plastic-free, albeit at the cost of Jajpur’s environment, labour, and uneven exposure to toxic fumes by female Dalit bodies. The NGO did attempt to re-define the scope of the ‘private’ and the ‘public’ (notably, by inviting me to advise on more efficient and holistic systems for plastic waste management). However, the lack of mention of Jijibai (or other hired waste-workers like her) from what the village elders had described to me as ‘no system at all’ to manage plastic waste would further re-affirm such a structural violence. Indeed, it suggested a backgrounding, if not muting, of mundane gender and caste-based labour arrangements of plastic removal from the dominant spaces of public knowledge.

Jijibai and the two other women were *chamaars*—a Dalit subcaste traditionally designated to clear animal carcasses and recover hide to perform leather crafts. As ‘untouchables’, they were not allowed to own land or to live in the main village where land-owning upper caste families inhabited. Residential patterns in Jajpur followed pre-existing caste hegemony: Separate quarters for each of the landed upper castes—Brahmins, Jakhar Jatts, Gehlot Jatts, etc. The settlement of Dalits—socially separated by endogamy and minimal social contact—were more decentralised, as they continued to live as squatters far from the main village without ownership rights. Jijibai had put together a shanty for herself close to the state highway where nobody seemed to mind her solitary peripheralised presence. Assembled manually with bamboo sticks, old saris and discarded fertilizer sacks of woven polystyrene (recovered incidentally from the employers’ farms), Jijibai’s *ghar* (home) stood on a raised platform of dried mud. Ritual spatial separation of habitats and caste-based relations of practice seemed to predominate mundane and everyday socio-economic life in Jajpur. To be sure, this was more than 65 years after untouchability and ‘public’ discrimination by caste had been abolished by the independent Indian constitution, and emancipatory policies had been implemented by the state. Yet social and spatial categories of the ‘public’ and the ‘private’, the ‘inside’ and the ‘outside’, were practised differently than in governmental rulebooks (Chakrabarty 1991; Chatterjee 2011), and seemed to reproduce many pre-existing patterns of purity, pollution, and exploitation (Doron & Raja 2015; Teltumbde 2018). Indeed, the land-owning upper caste residents had traditionally depended on cultivation of proximate ancestral lands and cattle rearing. These were home-based enterprises supervised by the family, but they enrolled local landless Dalit men and women as essential labour. Caste was, thus, an economic institution whose socialisation enabled the extraction of lower caste labour through acquiescence, or by veiled threats of caste-violence. The cultural understanding of caste subservience offered absolution to the upper caste ‘employers’ from the responsibility of offering payment against service. Many *mahajans* did not provide remuneration; some did but offered payment in kind, and almost never in cash.

However, when I met Jijibai removing plastic waste from the *mahajan's* land in 2015, the 'traditional' socio-economic patterns of life at Jajpur had undergone certain significant changes. In effect, the proliferation of plastic packaging and waste highlighted some of the key continuities and changes in Jajpur's emergent social, economic, and spatial history. The rising prominence of retail commerce was linked, in part, to broader socio-economic and environmental changes occurring in the region. Village elders—many of them land-owning upper caste farmers—told me that agriculture was no longer sustainable and had to be scaled down due to: increasing costs, uncertain demands and sale-prices; aggravated by receding ground-water and scanty rain. Agriculture was further limited due to lack of farm-labour. Indeed, of late, many younger men from the village had migrated to Jodhpur or to other cities in Rajasthan (and other states of India) for jobs in industry and in services. Many had joined the army for a publicly secured income. As such, Jajpur's local economy depended more significantly on remittances than on local production. With the returns from agriculture diminishing, many Dalit families had migrated to the cities and had escaped exploitative social bonds of the village. This would include Jijibai's two sons, who found informal work in Jodhpur and founded families of their own. However, their small homes had no place for the ageing Jijibai, who had lost her husband many years ago to an unfortunate road accident. The lady was, therefore, left to her own devices.

In this context of a diminishing agrarian economy, essential commodities came to Jajpur's population predominantly from elsewhere. They were pre-packaged and made commercially available at the shops, as these daily items were no longer produced locally—be it rice, wheat, pulses, or oils. Under these circumstances, the persistence of gender and caste-based labour against payments in kind further reduced the agencies of consumption for the likes of Jijibai, who had limited access to cash currency. The emergence of retail commerce opened up Jajpur to new capitalist networks and to processes of profit accumulation, configuring new consumption cultures and aspirations (say, children wanting new kinds of snack or seeking new kinds of cloth items like denim), but also creating new local enterprises and socio-economic agents (e.g., (green) grocers, SIM card dealers, and other merchants). Most of these new commercial and business enterprises were started by the land-owning village residents (say, by converting the front room of one's house into a shopfront). As such, many of the pre-existing social hegemonies were carried forward through Jajpur's economic transformation, and were reproduced in new ways. In particular, the exploitation of lower-caste labour by the landed *mahajans* continued—as has been seen, albeit in more hazardous and financially unattractive forms. Surely, the emergence of new commerce and consumption practices created new vocations of work for the residual Dalit population (like Jijibai): Picking plastic waste, keeping private estates clean, running errands, etc.; however, their situation evidently became more vulnerable. The manual handling of discarded matter seemed not least to re-trench culturalized social hierarchies and pre-existing

forms of subjugation based on ritual notions of purity and pollution (Doron & Jeffrey 2018).

Plasticising the 'Social'

A critical understanding of the complex socio-economic and environmental mutations in urbanising Jajpur would remain incomplete and ineffective if the role of plastics in the creation and stabilisation of new consumer markets was ignored, especially in view of the place's demographic differences. After all, plastic was adopted—more or less—by every resident in Jajpur to fulfil their needs and aspirations. Hawkins' analysis (2012) of plastic packaging as a 'market device' is a relevant conceptual tool in this regard, as it frames plastic packaging and commodity-containers as material artefacts, at once technical and cultural, involved in the construction of markets. Plastics are accorded limited agency within this notional framework, as they are seen as materials which 'do not simply address problems in reality but also come to shape reality itself in particular ways' (Hawkins 2012: 70). In particular, plastics are not simply seen as pure and inert, but as materials which are produced for a purpose. Indeed, as mentioned above, plastics commonly refer to a class of synthetic compounds, whose abundance (say, from predominant petrochemical sources) and malleability have made them quintessential to material design and product manufacturing (Bensaude Vincent 2013). Theorising 'plasticity', Bensaude Vincent draws on how plastics can be molecularly enhanced, mixed and matched, re-ordered (say, in polymeric chains and lattices) to circumvent any incumbent production constraint which may include technological limitations, market demands, state policies, public concerns, etc. As such, plastics are conceived as a versatile matter, which may be configured 'atom by atom' (Bensaude Vincent 2013: 25), free from nature's constraints to make any material, produce any object. Plastics can thus mimic forms and adopt any desired function—pliable to any human need with infinite potential for reproduction. Commercially speaking, this translates to a wide range of products suited to different uses, priorities, purchasing powers, socio-political environments, and markets. Coming to Jajpur since the early 2000s—as the residents recalled, plastics were involved in the convenient and efficient transit, storage, and distribution of different commodities through secure packaging and containment. Plastics enabling industrial consumption cultures has been abundantly discussed (see: (Meikle 1995; Westermann 2013; Hawkins et al. 2015; Doron & Jeffrey 2018)). The focus here is on the making of a retail consumer market in Jajpur, actualised most notably with/by plastic carrier bags, which end up as the most prominent form of plastic waste in the region.

The ubiquitous plastic carrier bags—connecting the home (supposed as the site of consumption) and the market (say, the grocery shop)—mediate a distinctly 21st century shopping experience in India, post-liberalisation. Indeed, opaque plastic bags do not only protect the privacy of consumption, as leaves or paper wrapping previously did, but they also ensure more efficient, less messy, convenient shopping experiences. The plasticity of plastic ensures the large-scale manufacture and diffusion of

different kinds of carrier bags, which are adapted for different products, publics, markets, and scales. In particular, they enable market access and increase the flow of commodity into the 'bottom of the pyramid' (Cross & Street 2009; Prahalad & Hart 1998) while maintaining profitable supply-chains.

For the few affluent families of Jajpur who purchased commodities in bulk, the high tensile strength of polythene bags helped in the manual transport home of large quantities of goods in one trip. However, for most families with lesser purchasing power who preferred purchasing smaller portions of rice, pulses, and oil, smaller carrier bags enabled desired quantity of rationing by decanting at the point of purchase. The purchase of groceries was a predominantly gendered activity in Jajpur, as the women of the house visited the nearby shops during the day after finishing domestic chores. Particular qualities of the plastic bag made it popular among the local women. While the inert, durable, and non-permeable polythene film helped efficiently carry fluids (oil, kerosene) and small grainy commodities (rice, different kinds of pulses), the C-shaped holding cut enabled secure tying of the sac's mouth. Therefore, many such small secure pouches of fluid purchases could be made to fit inside a bigger plastic bag, which could be carried around by one hand, possibly freeing up the other arm for increased productivity, facility, and social interaction during rare occasions of public life for the women in an otherwise conservative patriarchal society. To sum up, these market devices facilitated increased spending and per capita consumption by easing the mobility of goods. Since they incentivised purchase and helped drive up sales, many local merchants offered carrier bags for free (in 2016, India's new Plastic Waste Management Rules made it mandatory for businesses to levy charges for carrier bags; however, these rules have been variously mediated in practice (Pathak & Nichter 2019)). Due partly to the wide range of demographic needs, vulnerabilities, and desires, which they scaffolded, plastic bags had replaced banana leaves, newspaper or brown paper wrapping, and cloth bags in Jajpur by the late 2000s. Pathak and Nichter write that these other packaging materials were rarely offered by retailers even in semi-urban areas in the new millennium (Pathak & Nichter 2019).

The plasticity of plastic enabled mimicking and replacing existing packaging/containment materials while offering new properties and practical-economic possibilities. Over time, small-scale local craft enterprises making packaging from printed newspapers, leaves, etc. ceased to exist. Due to their abundance and easy/free availability, plastic carrier bags and other packaging devices became ubiquitous and mundane—not simply by default—but through (often violent) erasures, replacement, and re-enactment of local cultures, materials, practices, and modes of production (Hawkins 2020). The large-scale proliferation of plastic products in Jajpur must therefore be studied critically as part of wider value-calculations and enterprises in capitalist market-occupation. This will also bring into relief possible policy perspectives influencing localised economies and cultures, which are mutated and made critically dependent on plastics. The popularity of plastics in Jajpur

(as in other places), especially their vital socio-economic entanglements with different sections of the population, must be seen in the context of unprecedented increases in plastic capitalism in India over the years, highlighted by ever-increasing production of fresh petrochemical feedstock (Plastindia 2018), and its most significant uptake (>24%) in the packaging and FMCG sectors (BPF 2011). Therefore, the local residents and NGO mobilising against a plastic 'invasion' were fighting a complex, if not futile, fight, in which they were socially, economically, and politically dependent on plastics (Dey & Michael 2021).

Furthermore, as Hawkins illustrates with the aid of PET bottles, most packaging devices, including cheap/free carrier bags, are 'made to be wasted' ((2013) see also (Hawkins et al. 2015)). The conceptual elaboration of 'disposability' responsabilises plastic production by framing 'waste' not simply as an externality but as a pre-calculated and integral part of consumer capitalism. Indeed, most packaging materials and carrier bags/pouches 'work' to securely translocate the enclosed commodity to the site of consumption, following which their usability may be severely limited. Especially in the absence of means, methods, and motivation for re-use, these objects must be disposed of, else they would accumulate, occupying private space. E.g., polythene bags used to transport decanted oil portions in Jajpur are valued partly because they may be thrown away once the oil had been transferred to a household container, without the household having to suffer any immediate or substantial financial loss as a result. The value of carrier bags derives from their mundaneness, cheapness, abundance, and replaceability. Therefore, plastics produce disposing publics and co-enact particular 'use-and-throw' cultures, almost as part of wider processes of profit accumulation from their production and distribution. Furthermore, infrastructurally under-developed places like Jajpur, with inadequate equipment to treat plastic waste, become 'sinks' for the resulting plastic waste. Assessments of Jajpur's ecological degradation or of the physical damages to its more-than-human population do not make it to air-conditioned board room calculations of plastic capitalism. The accumulation of plastic debris and derivatives in the commons of Jajpur or in the bodies of working Dalit women and roaming cattle is a form of violence, where these forms of exploitation are internalised and invisibilised within the large-scale pursuits of privatised profit. Jajpur's enactment as a market for retail consumerism but its dereliction as a sink for plastic waste highlight how plastics are incidental in (re-)producing processes of value extraction and inequality across scale. They also draw attention to the gaps in public representation and the limitations in local governance.

The ever-increasing quantity of plastic waste and the crises raised in their wake visibilise a certain lack of plasticity in plastics. Their durable persistence poses a counterpoint to Bensaude Vincent's version of plasticity as substances—supposed to be infinitely mutable—manifest as intractable and problematic after their intended use is over (Michael 2013; Altman 2018). They are 'stubborn' and do not yield. In part, such immutabilities are intended, as the denial of reuse fuels fresh consumption, keeping the commercial and supply chains running and expanding.

Plastic's immutability produces uneven patches of plastic accumulation in the village—e.g., on the streets but not in the *mahajan's* fields: These persistent spatio-material topographies visibilise more localised patterns of producing difference through accumulation and exploitation. The uneven distribution of plastic waste (and noxious fumes) across the bodies and sites of Jajpur help us perform a localised critique of practice, but also makes such caste and gendered inequalities part of a globalised problem. This is because plastic fuses together localised as well as wider networks of extraction and abandonment. Here Jajpur's own forms of socio-economic inequality (Dalit/non-Dalit; affluent/poor; gender-inflected) overlap with, and are compounded by, environmental, racial, and regional (rural/urban; Global South/Global North) injustices. Therefore, the 'plasticisation' of Jajpur not only produces critical socio-material mutations—in terms of new consumption cultures, aspirations, vocations of work/enterprise; but it also hinges around critical immutabilities and 'mutings'—unchanging social hegemonies, degradation, and violent erasures. The latter includes obliteration of former packaging materials, prior material cultures, and small-scale industries, as well as socio-economic, corporeal, ecological damage, degradation, and losses highlighted by the (toxic) intractability of plastic waste (and its derivatives).

Plastic Mut(e)ability

As I spent more time with Jajpur's informal plastic gatherers and as I looked closely into local everyday practices, I observed that not all plastic waste emerged as immutable; instead, some were being salvaged and re-configured—mutated—for fresh use. The reuse of discarded plastics was, however, not a common social phenomenon. On the contrary, this was performed mostly by informal plastic gatherers—by the dispossessed and the marginalised who could not easily buy or obtain fresh plastic products from the shops. For example, various plastic (waste) mutabilities were performed rather routinely by Jijibai within the private confines of her shanty; these salvaged, washed, dried, re-used, re-purposed objects would provide Jijibai affordances, quotidian company, and practical support. These examples would suggest that Jijibai, despite being at the receiving end of systemic exploitation, was muted but not completely mute. That is, she did nevertheless possess limited capacities to act. 'I am poor', Jijibai would admit, 'but I always make do'. If these plastic mutations can be considered instrumental in Jijibai's everyday agencies to negotiate socio-economic mutings, then plastic mut(e)ability might offer a care-fully critical perspective to analyse the marginalised socio-materialities of plastic. That is, to not just conceive the silencing or degrading aspects of plastics, but to shed light on the agential potentials as well. At the very least, it would complicate the picture of plastic's 'social life', marked by marginalisation and abandonment, by visibilising some of the limited capacities assembled at these very margins by/with plastic waste materiality. As such, Jijibai emerges not purely as a mute victim of socio-economic hegemony compounded by plastic capitalism, instead, her practical knowledge and crafty tactics, alongside some of the material capacities of thrown away plastics, are visibilised. Furthermore,

one might wonder if these instances of plastic mut(e)ability offer grounds to articulate alternative possibilities (and impossibilities) of making and doing with plastics, especially in everyday sites and settings far away from the factories where products are usually made. As such, plastic mut(e)abilities constitute alternative conceptualisation of processual knowledge. Indeed, these 'abilities' are often backgrounded, if not muted, by more powerful discourses and claims of (industrial) plasticity. In a social setting, where even the most visible forms of infrastructural labour in waste removal were removed from presentable public discourse (recall: 'No system at all'), the mundane crafts and hacks by Jijibai were even more obscure as they occurred in private, at a caste-marginalised home, hidden from the 'public' view.

Prolonged contact with Jijibai revealed ways in which she would creatively re-deploy plastic waste in assembling together a life to the best of her circumstances. In effect, when Jijibai generously invited me to her road-side shanty after work on one of the first days of our meeting, I was not expecting so many different plastics in productive reuse. The shanty in itself was a monument of plastic mutabilities: Woven polypropylene (PP) sacks once used to package fertilizers for the neighbouring farmlands had been cut open into a wider film and tied to bamboo posts to produce a flimsy 'wall', protecting the indoors from dust, sand, direct exposure to the sun, or from prying eyes. Sometimes, plastic was compounded with other materials. Multiple PP films were supplemented by layers of old saris to generate further insulation. Successive layers of similar fertilizer sacks formed the basis of Jijibai's floor mattress, to which she added a soft touch with upper layers of cotton sari. Several flimsy low-density polythene (LDPE) plastic carrier bags, crumpled together, were enclosed within another sari to serve as filling for a workable pillow. According to Jijibai, this was a great living arrangement, given the warm weather and the scarcity of rain in Rajasthan the walls of sari and woven polypropylene ensured circulation—'*har* (all) time AC', she would insist. High-density polythene (HDPE) or PP containers of shampoo, detergent or oil, PET bottles, etc.—discarded by the village but salvaged, cleaned, and dried by Jijibai—served as domestic utensils.

Jijibai was amused by my fascination with her plastic hacks. Over time, she became friendly as I shared stories of my own mother re-purposing plastics and would hand over plastic objects that I came across and which I thought she might find useful. She opened up about more plastic mutabilities as time progressed. Jijibai's hair had become matted, perhaps due to the desert sand and dust she was exposed to during long hours of outdoor work. In the absence of hair straighteners and combs, which she could not afford, she used particular kinds of plastic carrier bags to disentangle her hair. When the hair softened after washing, usually with water leaking from the nearby irrigation pipes, she used the material most suited for the purpose: Carrier bags and discarded packaging material that developed strong pointed vertices when crumpled. Jijibai would explain the process, playfully poking her sharp fingernails at me to demonstrate (with some exaggeration) the desired degree of pointedness.



Figure 1: Polythene crumpling for detangling hair (representational image). Photo: Author.

The crumpled bag was held firmly within the grip of one hand with densely packed pointed vertices held together like the ‘teeth’ of a hair-brush (**Figure 1**). The strands of matted hair were then held tightly with the other hand as the crumpled bag was run through them vigorously, the ‘teeth’ detangling the hairy knots as they passed through. This was Jijibai’s guerrilla technique of self-care, assembled in a context of perceived material lack, where particular bodily capacities, capacities of available materials (thick HDPE, PP or cellophane objects), surrounding infrastructures and leakages, etc. were deployed in a productive combination ‘to make do’.

Sociological studies in technology show us that objects have certain methods of use, ‘scripts’, imbibed in their material configuration which mediate what may (not) be done to/with them. Drawing, for example, on Latour’s critical analysis of the ‘door-closer’, which demands particular embodied skills, internalised techniques and expectations (one may expect the door not to slam closed too quickly) for its safe and effective use, mundane technology configures the body into practical disciplines and cultures of practice (Latour 1992). The more entrenched the device within social life, the more predominant its technoculture. However, in Jijibai’s case, we observe routinised mutations to the dominant scripts of object-use whether for carrier bags, shampoo, and oil containers, or for fertilizer sacks. Echoing Akrich (1992), who discusses photoelectric lighting kits being ‘tricked’ in French Polynesia, we find technical devices being subverted in Jijibai’s case too; mutated to adapt to local priorities. Speaking for plastics, it would appear as if the plasticity of these objects—the multiplicity of their functions and forms—are ongoing; thereby posing a counterpoint to the supposed immutability of plastic waste. One is justified in speculating if these routine techno-cultural mutabilities performed by Jijibai hold promise for crafting better plastic futures; i.e., if they suggest new scripts of productive reuse and remediation techniques, enacting extensions to the ‘social life’ of plastics to reduce waste? Furthermore, if ubiquitous technological devices, like plastic carrier bags, are

incidental in a cultural material ordering of our everyday lives, do these plastic mut(e)abilities offer the possibilities to ‘re-assemble society’ differently?

We proceed with caution and do not offer definite answers with sweeping generalisation. Instead, we situate Jijibai’s plastic mut(e)abilities within their specific material, socio-cultural, economic, and technical contexts; thereby offering some concrete reflections on process, materiality, and the plasticity of plastics within them. By drawing attention to the specific, we argue for contextualised studies of plasticity to speculate on localised (im) possibilities.

Contrary to Bensaude Vincent’s conceptualisation of plastic’s infinite mutability, Michael’s pragmatic analysis of processes with plastic argues that plasticity is itself ‘...a plastic concept, its content and utility varying under different circumstances.’ (Michael 2013: 33). Drawing on the practical difficulties of plastic re-purposing and 3-D printing at home (presumably in present-day England), Michael articulates a limited plasticity, where plastic objects would not readily yield and mutate their form and function as pleased by the craftsperson. He highlights issues around difficulties in procurement and mobilisation of appropriate materials, tools, expert knowledge, infrastructural support, etc. In attuning an analysis of the process to its situation and context (site where the process is occurring, technologies being used, motivations behind the process, etc.), Michael’s description performs a relational notion of the material, where plastic’s mutability is not given—instead, it is emergent, not least through the incumbent combinations of tools, knowledge, and other specific affordances. It is only under the ‘right’ conditions and affordances that specific materials yield, and if they do, they do so along particular (molecular) routes. The scope of Michael’s description of plasticity extends also to the petrochemical ‘factory’, where, despite high-end machines, patents, and the muscle powers of capitalism, not every plastic material may be mutated as desired (Hawkins et al. 2015). The mutability of thermoplastics with the application of heat, as opposed to the

immutability of thermosets by application of thermal energy, may be a case in point. Specific capacities of materials are 'expressed' (De Landa 2011) in specific technoscientific contexts and infrastructures.

Michael's enactment of plastic's materiality, its plasticity, draws on the rather crucial concept of material 'informedness' (Bensaude Vincent & Stengers 1996; Barry 2005). Within this conceptual framework, molecular matter is never fixed or pre-determined but is historically contingent, emergent through diverse (physico-chemical, biological, technical) encounters and interventions. Therefore, what an object *is* depends on its historical route, and its nexus of relations, which determine its informedness; a kind of enrichment of its matter with information. This pragmatic understanding of matter as emergent and heterogeneous 'assemblages' draws on the process philosophy of Whitehead (1978; Halewood 2011), which does not privilege 'society' or 'culture' as ontologically separate from the 'material'. A material object, e.g. a device which we call a carrier bag, is not only informed by molecular matter, technology, and design (material inertness, impermeability, tensile strength, form, etc., for the efficient transport of suitable material content) but also informed economically (by its pricing or use in specific markets) and socio-culturally (by meanings attached to its colour, brand-prints, or by the materials it is made to contain—from food to dog feces—and the traces they leave behind on the object). Each of the different relations and interventions inform materials, and thus produce objects which may be treated and valued differently despite similar build. In this case, informedness enables a consideration of each of Jijibai's plastic containers and carrier bags as (uniquely) informed materials at their point of recovery (e.g., on the farmland, the streets, or being handed down directly by the *mahajan* households). It is not by chance alone that Jijibai referred to some of the plastic bags as *rangeela* ('colourful', masculine), *kharkhari* (alluding to the sound the object made when crumpled), *jiddi* (persistent, feminine), *ganda* (dirty, masculine), *nikammi* (useless—of no workable use, feminine), etc. Furthermore, the gendering of objects suggests that Jijibai, in reclaiming, interpreting, and revaluating objects, was already re-informing, if not vitalising, them in particular ways within everyday contexts of use.

Socio-material informedness seemed to determine the (im)mutability of particular plastic objects. This point can be illustrated with regard to carrier 'bags' re-purposed and used for hair-detangling: *Ganda* carrier bags—especially those with the traces of oil, putrefied food leftovers, or dust—were not reclaimed for domestic use, instead they were summarily rejected, burnt. The sticky presence of repulsive matter informed these carrier bags as *ganda*, and through their selective acceptance and rejection, Jijibai re-affirmed certain socio-cultural values of purity and pollution even at the caste margins. Furthermore, the informedness of plastic bags as *ganda* led to their unsuitability and immutability for reuse. Immutability is thus not given but specific to the process in question and emergent, due partly to the prior processes and technocultures that the object has been/is involved in.

Kharkhari, on the contrary, would correspond to carrier bags made of thick-film HDPE or polypropylene, which were readily sequestered by Jijibai for the purpose of straightening matted hair, provided they were not *ganda*. Thickness of film and high-density polymer materiality (with high tensile strength for effective commercial usage as a sac) resulted in low elasticity when crumpled which meant that crumpled *kharkhari* bags retained their 'teeth' longer and more reliably, facilitating Jijibai's efforts at hair detangling. Indeed, molecularly speaking, compared to thin low-density polythene films, the higher molecular weight and density of thick HDPE or polypropylene film would not allow polymer chains to spring back immediately. Thus, the 'teeth' would stay in consistent shape for longer, resulting in stronger vertices. High tensile strength further ensured the film did not tear, ensuring longevity of the 'bag' for the purpose of hair-care. Furthermore, Jijibai would prefer white bags to *rangeela* bags for the intimate post-bath ritual of hair-care as colour concealed traces of dirt, which Jijibai wanted to avoid. Thus, we may be able to appreciate how the prior informedness of carrier bags (their thickness, tensile strength, polymeric structure, colour, etc. but also marks and smudges as remnants of their use-histories) are interpreted and assessed and then suitably deployed.

In this regard, not just the chemical composition, but also the formal design of the 'bag', the cuts and joints that in-form pre-formed plastic film into a functioning sac (a single-film cavity inside which purchased goods may be securely contained), is quite literally turned on its head by Jijibai. Indeed, once upturned and crumpled, the bounded convexo-concave form became more easily amenable to a single manual grip. A film of the same surface area, spread out like a lamina, would contrarily be more difficult to hold to grips. As the crumpled plastic bag, along with its creases and 'teeth', is gripped tightly, the other hand is left free, available to hold the matted hair in place for combing. As such, the informedness of matter which had once enacted a 'carrier bag' also effectively informs the object to detangle matted hair—with only a few tweaks, crumples, re-orientation, and re-arrangement of its chemical, physical (material) disposition. Similarly, recent governmental rules to illegalise the circulation of plastic carrier bags in India under 50 micron thickness (to increase their potential for reuse and material recyclability) may also be regarded as another form of informedness; which might aid this particular form of plastic mutability enacted by Jijibai. Particularly, the threshold film thickness, which is meant to enact an 'object of environmental regulation', would also make the same material project consistently sharp and strong 'teeth' when crumpled, thus, perhaps unpredictably also emerging as a 'hair-detangling object'.

Conclusion

In this contribution to the 'social life of plastic' collection we drew upon the plasticity of plastics—the mutable quality of the material to inform multiple object forms and functions—and contextualised it to a haphazardly urbanising and socio-economically uneven site. While we illustrated how plastic's plasticity produced new mar-

kets, economic subjects and subjectivities in Jajpur, we also visibilised some of the immutabilities (social hierarchies along pre-existing caste and gendered patterns) and mutings (traditional packaging industries closing due to plastics capturing the market, decline of agri-culture, dependences on retail commerce, socio-economic decline for underprivileged groups, etc.) that plastics are also instrumental in (re-)producing. In particular, the accumulation of plastic waste in the commons of Jajpur served a counterpoint to plastic's supposedly promethean mutability by highlighting critical material immutabilities: Plastics are *not* infinitely mutable. Plastic's immutability and the technological, ethical, and ecological crises raised by plastic waste rendered prominent the problematic plasticisation of Jajpur, where a retail consumption market was promoted (with plastics acting as market devices) and suitable plastic waste management and recycling/reuse infrastructures were not.

In this regard, plastic's (im)mutability visibilised some of the local informal arrangements of plastic waste removal which further entrenched pre-existing localised patterns of social exploitation. However, Jajpur turning into a 'sink' for plastic waste also raises deeper concerns about more global processes of private capital accumulation at the cost of public abandonment and socio-environmental degradation performed through plastics. Jajpur's ecological degradation, caste, and gendered experiences as well as the perpetuation of socio-economic inequalities through plastic (waste), then, become part of a bigger problem, situated within a wider nexus of (regional, national, global) relations. Yet, recursively, the unevenly ubiquitous plastics not only co-produce, but also offer a 'material' perspective and a language to articulate some of these scandals of scale.

The conceptual detour of plastic mut(e)ability further complicates this picture of plasticated violence in Jajpur by visibilising the socio-material potentials plastics help enact, especially at the margins and in the lives of people 'muted' by such systemic oppression. In this regard, we noted that plastic mut(e)ability (referring specifically to the plastic hacks and re-purposing observed in Jijibai's household) was not due singularly to the material; to the craftsperson; or simply to socio-economic, cultural, technical environments, and relations, but specifically to their *coming together* in suitable contexts and combinations. Our critical analysis thus projected a pragmatic view of plasticity. Jijibai's mut(e)abilities have limited potentials for mitigating the effects of plastic waste, or to promise any radical social change. This is because her remediation of plastic waste was, to a large extent, structurally dependent, including how she sourced necessary 'raw materials', i.e., from 'left overs'. Her mut(e)abilities were contextual; specific to her situation and not replicated at scale to offer substantial resistance to the fast-paced patterns of large-scale plastic influx, consumption, disposal, and waste accumulation in Jajpur. Indeed, Jijibai's hacks and tactical plastic reuse occurred within (and perhaps because of) more structural conditions of economic impoverishment which plastics help shape in the first place. In other words, plastics play a

part in systemic mutings, and it is amidst the abundance and variety of material ruin—what is left behind—that limited techno-material affordances emerge. In any case, plastic mut(e)ability enables a nuanced and dignified representation of Jijibai not simply as a victim, but as an agent with limited capacities to mediate plastics and the 'material' conditions of life. Plastic mut(e)ability offers us a lens to study the social and material life of plastics in Jajpur, critically, and carefully, indeed, as a specific yet globally-connected site. As such, I claim these plastic mut(e)abilities neither unique nor universal. Contrarily, they illustrate liminal co-becomings and (im)possibilities actualised by specific plastic objects in particular practical settings, which may or may not be replicable elsewhere. As a concept, therefore, it is malleable to a limited degree—like plastic.

Ethics and Consent

The article draws on past anecdotes from the author's personal experiences, and therefore, no ethical approval for research has been sought. The names of persons and the village have been anonymised.

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Competing Interests

The author has no competing interests to declare.

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