



# **Towards Incorporating Ethical Considerations into Indian Civilian Drone Operations**

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Cover Image © Shashank Srinivasan: Local community members observing a drone operation in Pilibhit, Uttar Pradesh.



*"Technology only amplifies underlying human intent and capacity. "*

*-Kentaro Toyama*

## **Introduction**

Unmanned Aerial Vehicles (UAVs), also known as drones, are aircraft systems that are capable of either remotely-operated or autonomous aerial operations. While extensively used in the military space, they also have civilian applications and as with any emerging technology, new use cases are perpetually under development. However, while civilian drones may be used for good, it is also possible for them to be misused, both deliberately or inadvertently.

As professional users of this new technology, we are aware that every decision we make regarding our use of drones can have ethical implications on others. Over time, this has become a more conscious and explicit process for us which is governed by our personal standards. We realised though that even when we decline a project due to ethical concerns, it is possible for the project to go ahead with other drone operators, who may be unaware of the gravity of their decision. At the same time, it is also possible that we ourselves are unable to account for our own biases while evaluating use of drones for projects that we do accept.

Estimates of the number of civilian drones in India vary from 40,000 to 6,00,000. Irrespective of the actual number, from our own experience in the industry we are aware that while in early 2015 it was still possible to fly drones in remote parts of rural India and attract a crowd for whom this was a novelty, by early 2020 drones are considered commonplace. It is reasonably straightforward to find a drone operator in any state in India, who may or may not be in compliance with the regulations put in place by the Directorate General of Civil Aviation.

While there are extant regulations governing the use of drones in India, these regulations do not include sufficient guidance on the ethics of drone use. We know that there is thus a need for an ethically-explicit framework for civilian drone operations in the Indian context. Ideally, this would be applicable to a variety of projects, have a low barrier to implementation, and would help standardise ethical decision making for participants in the Indian civilian drone industry.

We hope that this report is a step towards the creation of such a solution. It consists of a summary of our research on this subject, as well as our insights for ethically conscious drone use. It may be useful for anyone in, or engaging with the drone industry, and will be particularly relevant to those who intend to build solutions that would address the social implications of civilian drone use.

The use of drones for military purposes is outside the scope of this report; our use of the term UAV or drone here refers exclusively to non-military drones.

## Methods

We began exploring social implications of drones and new technologies through a literature review of academic papers. We supplemented this theoretical understanding with a review of news articles relating to drone use in India, as well as of relevant government documentation.

We interviewed industry experts to gain a finer understanding of how drones are perceived in India. This included drone policy lobbyists, technologists, drone manufacturers, academics and community engagement professionals to understand various components of the ecosystem and specific concerns with each. We also interviewed drone users, to understand more about their experiences with operating UAVs in the field. The culmination of this process was a field trip to a rural community impacted by drone use.

Together, our interaction with individuals and organisations across the drone industry, as well as with impacted local communities, helped us begin to comprehend the ground realities, social inequalities and power dynamics that must be taken into account while building towards the fair and inclusive use of drone technology.

## Findings

Our literature review highlighted concerns of safety, privacy, data security and psychological well being of the communities impacted by drone use. These concerns do not seem to be adequately addressed in Indian drone regulations. For example, India's new drone policy does not seriously address privacy or set boundaries for the use of civilian drones by the state. To compound this loophole in justice, the Personal Data Protection Bill (2019) recently passed by the Indian government allows the government to use non-personal data without consent. This is relevant to the ethical use of drones as since drones can be used for the collection at a large scale, it is possible that private information may be collected while in the process of conducting legitimate operations. At present, privacy safeguards related to drone operations depend upon the self-determined judgement, knowledge and experience of the individual drone operators.

Interviews with industry experts brought to the fore the diversity of opinions on drone ethics across the industry. Academics and those concerned with community engagement highlighted the urgent need to consider ethical safeguards for the use of drones. Drone operators re-iterated that the decisions they made while flying the drone were based completely on their personal judgement, although there were a few instances where they indicated that they faced ethical dilemmas while making on-the-spot decisions during a drone operation. For the most part Interviewees who self-identified as being involved in the drone manufacturing or data analysis segments of the industry disassociated themselves from the consequences or social

implications of drone use as beyond their purview, as they felt that this was something that only drone operators should be held accountable for.

*An academic researcher provided us with an example of an ethical dilemma he faced while conducting fieldwork: While collecting drone data in a Protected Forest Area, if you inadvertently capture imagery of illegal activities such as entry into the forest area- what do you do with the data and information? Do you report it? Do you delete it? Do you need to warn people before you begin capturing images of them, even if they are not the official subjects?*

From our field visit, we found that (in the specific rural community that we visited) individual community members possessed varying degrees of knowledge regarding what a drone was, and what it was capable of doing. The information was informally received from multiple semi-reliable sources over a period of time, did not seem comprehensive or structured, and may have been mis- or dis-information. Furthermore, the community did not have access to drones, and their only stated experiences of drones were their use by the state to intimidate them.

This provided further evidence of the need for ethical safeguards and accountability. The importance of checking who has access to both the drone as well as the data acquired by it drone was highlighted in this experience as well. This concern was also voiced in interviews with academics, and emerged in our review of the literature as well.

## Steps towards more ethical civilian drone use in India

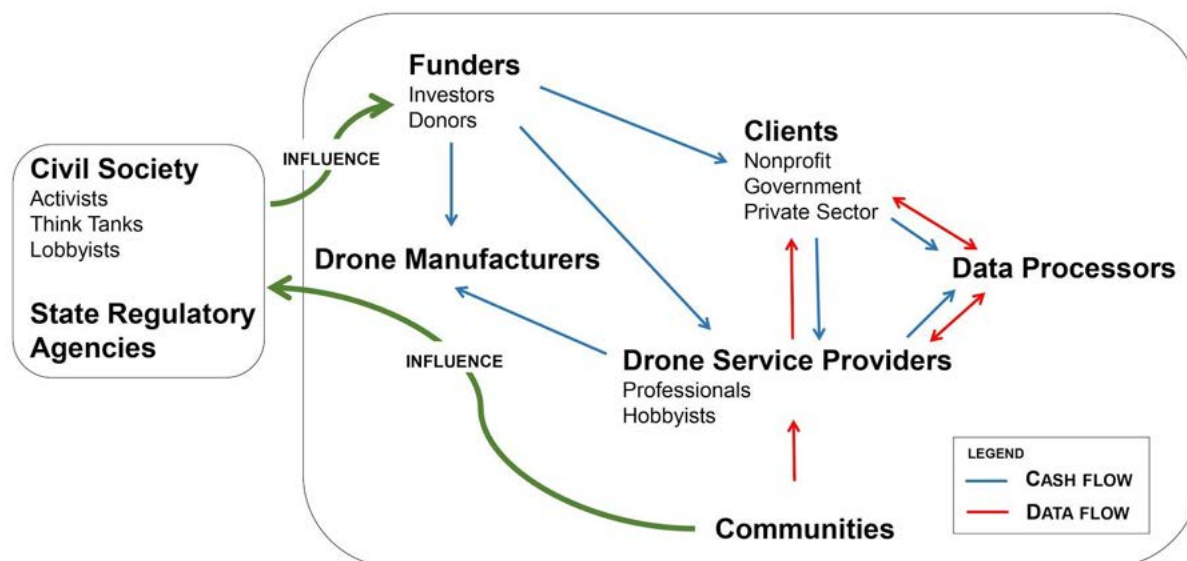


Fig 1. Diagrammatic representation of the civilian drone ecosystem

A project involving drone use entails many levels of planning and engagement (Figure 1). There are funders, who in one way or the other finance the manufacture and use of drones. There are the drone manufacturers who design the devices, acquire components and produce them for lease or sale, and then there are the drone operators, who procure the drones and operate them. For large projects, a funder provides the financial resources to clients, who among many other service providers, hire drone operators for specific operational aspects. Aside from the financial flow, there is also a flow of data between participants in the industry. Outside the direct financial and information flows, the other important players in the industry are the state, whose role is to create and enforce industry regulations, and the civil society sector, which comprises think-tanks, policy makers and lobbyists.

At present, the purpose of the entire industry in India stems from the requirement to have an individual operating a drone for the purposes of data collection. This may be for the purposes of mapping, or for experimental purposes towards the eventual deployment of autonomous delivery drones, but the actual activity being conducted at this point of time is the same. Outside of depopulated areas, it is very likely that these operations will, either inadvertently or purposefully, result in the collection of data that could potentially impact communities who are otherwise non-participants in the drone industry. Inculcating ethical drone use will need to involve each of these stakeholders in varying capacities to change the way we design, think of and use civilian drones.

Where does one begin with this engagement and what strategy should be adopted? While each component of the drone ecosystem plays an important role, our research indicates that for the purpose of promulgating ethical behaviour in the industry, it would be best to begin by working with two groups; namely, the investors, and the impacted local communities.

### **a) Engaging with funders**

Convincing funders of the need for ethical considerations in drone use is the first major step towards creating the impetus for action in the drone industry. A funder who insists that drones must be used ethically in any projects they fund, will ensure that every industry member benefitting from their funds will need to comply with their requirements. This propagates both action and accountability of ethically considerate drone use through the industry. From our work, it is most likely that before funders ask for ethical considerations to be included into projects they are funding, they will need to be convinced of the need to do so. Practitioners from the industry had some valuable lessons regarding the best approach to take while approaching funders on this topic.

Firstly, they recommended that these practices be communicated as something other than 'ethics', the perception of which is tied to an abstract concern which creates additional bureaucratic hurdles to actually doing 'work'. Rather, communicating this as a more practical project requirement, using terms such as 'best practices for social and wildlife risk avoidance' may be a good starting point which would improve the chances of this being incorporated into their practice.

Secondly, building a business case to incorporate ethical practices into drone operations would be more likely to convince funders than any appeals to moral reasoning. While the details are dependent on the circumstances, in general risk reduction is a valid financial reason to incorporate best ethical practice into industry operations. Since its growth spurt in the early 21st century, a primary barrier to the drone industry's expansion has been public perception and associated government regulation. In India, the civilian drone industry was banned completely in October 2014, and has only started growing again after the introduction of government regulations in 2018. However, if ethical practice (as contrasted to only legal practice) continues to be completely based on the decisions of individual drone operators, the entire Indian industry is at risk of being shut down by the government; it is not yet 'too big to fail'. This has already occurred in the past; the 2014 ban was imposed after the much-publicised effort by a Mumbai-based pizzeria to deliver pizzas by drone. This clearly emphasised the need for government legal regulation, at the cost of suppressing the industry for 4 years. The need for ethically-conscious regulation may not be analogous at the national level, but would definitely hold at the level of individual projects or regions.



Thirdly, for individual projects the need for ethics can be further emphasised with demonstrations of how such practice would assist with community buy-in for the continued operation of drones, but also with the larger project as a whole.

## **b) Engagement with impacted communities**

Communities may already have prior experiences with drones, and may also possess skewed informal prior knowledge regarding both the devices as well as the reasons for their use. There is an ethical requirement to thoroughly engage with potentially impacted communities prior to commencing drone work. Clearly structured accurate information, without deception but at an appropriate and accessible level, regarding the capabilities of the drones being used, the nature of the data being collected, and the future ownership and use of the data should be actively communicated to community members. An open discussion of concerns will help determine the community's level of comfort with their use, and providing a roadmap by which these concerns would be addressed could help raise this level.

*Speaking with members of a forest dwelling community impacted by drone use, we understood that they had been provided with limited information on what drones are. Referred to as 'little air-planes', a few individuals had been shown a state agency's drone, and were told that if they entered the forest, the state would know as the drone would be used to keep an eye on them. Others heard this news second hand. When we showed them our drone, they were interested in knowing more about the device and what it was capable of. We were told that data and privacy were not commonly understood concepts and hence the community did not worry about them. They were unsure of whether the state agency had the required permissions for drone surveillance, but were of the opinion that even if the drone flights were illegal, they would be hesitant to question the state's authority as it could jeopardize their land rights and security.*

Aside from the ethical need to do so, engagement with communities regarding drone use may also lead to better projects, which could be collaboratively conducted by the project proponent and the community. For example, one of our interviewees suggested that drones could be used as tools to facilitate co-management of forest areas between state and communities. Collaborating with local community-based organisations is one of the ways in which such a collaboration could be facilitated.

Beyond co-management and co-creation, there also needs to be a system of accountability for safeguarding the rights of citizens and impacted communities. At present, no formal mechanism exists for communities to challenge the ostensibly legal use of drones in their vicinity. Even if such mechanisms are in place, it is likely that communities would be reluctant to avail of them if doing so would jeopardise other aspects of their existence. This highlights the need to address unequal power structures while creating mechanisms of accountability of drone use, to ensure that they do not become an additional pathway to furthering inequalities or

exacerbating oppression. The details of the social, political and economic realities will differ in each case, giving rise to the requirement that any such processes or frameworks must be adaptable and flexible. To reiterate, working with grassroot organisations who may already possess this knowledge and possess a trusted working relationship with community stakeholders would be very valuable.

To facilitate both the collaborative and accountable aspects of community engagement, our learning has included an explicit articulation of the difference between ‘awareness’ and ‘engagement’. Community awareness and sensitisation come with connotations of being uni-directional, where an authoritative figure provides information to a community. Community engagement, on the other hand, is bi-directional, includes more dimensions of feedback and involves sustained interaction over an extended period of time, resulting in a transformation of both the community as well as of the project proponents. Knowledge on community engagement and around questions of informed consent have been explored in diverse intellectual fields, such as feminist bioethics, disability rights and participatory action research, and has direct applicability to the use of drones.

Finally, and importantly, we must note that a “community” has no single definition, and is rarely a monolith. Intra-community dynamics must also be studied and understood, to ensure that community engagement does not merely empower one privileged section while further suppressing a less privileged one.

### **c) Engaging with other parts of the drone industry**

To engage with the different components of the drone pipeline, industry experts recommended working on the multiple stages of a single project, which could facilitate engagement at various levels. Apart from funders and impacted communities, there is a need to continuously engage with technologists to make them aware of the consequences of their actions with the aim of mitigating their impacts. Finding and describing the real ethical concerns around the use of drones would be a useful step towards engaging with those segments of the drone industry that dissociate themselves from the social implications of their work. Workshops facilitating this understanding would be a practical step towards ensuring that when they are faced with ethically complex situations, they can make more informed and ethical decisions. Such workshops would also help ensure that the technologists are active supporters of community rights regarding drone use. To ensure that government regulations eventually include an ethical component, having a prominent technology partner on board to advocate this viewpoint would assist with convincing the state to do so.

Regarding the execution of such workshops themselves, physical or virtual spaces run in collaboration with industry partners that represent privilege and decision-making would attract

industry stakeholders. At the same time, these spaces and sessions need to be carefully curated to ensure that they are not restrictive, and allow for open discussions and engaged groups.

#### **d) Essential components for an ethical framework**

One particular gap that was highlighted over the course of our research is the need to document current drone use cases from India, and categorise them to portray different aspects concerning ethical use. This information is required if we are to move away from seemingly more abstract discussions of 'ethics' to a more contextual, applied and implementable approach that would be easily accessible to the industry.

Our work also brought to the forefront a set of valuable lessons that would assist with the process of ensuring ethically conscious drone use. A common perception issue of traditional ethical frameworks is that they are rigid and only applicable to a specific context. Frameworks which are both adaptable, as well as perceived as being adaptable, are necessary to ensure that there is significant uptake by the industry.

Another core component of any framework or process in this context needs to be reflexivity i.e. the creation of structured processes to incorporate information acquired during the implementation of the framework itself, that would allow for adaptation and greater understanding of the ground situation. This is especially important for an emerging technology such as drones, both for the community whose understanding and perception of the technology may shift as well as to provide the project proponents with enough space to ensure that their project is successful.

A very important component for any effort taken towards implementing an ethical framework will be accountability, to ensure that the recommended measures are applied and incorporated, rather than simply bureaucratic action-points. However, accountability cannot exist without addressing concerns of unequal power. While the details of power sharing and their inherent complexity will differ with each use case, it does need to be addressed in each exercise of ethical drone use. Questions of who controls the drone, who owns the data, how inclusive is the decision-making regarding projects, and what official means of grievance redressal are available to impacted individuals, are just a few of the many questions that would need to be considered.

Finally, transparency with regards to motives, processes, stakeholders and outcomes is of key importance, and needs to be openly and collaboratively discussed and documented. Without transparency, it will not be possible to incorporate reflexivity or ensure accountability, and the entire process will be weaker for it.

## Conclusion

The drone industry is still at a nascent stage in India. To ensure the growth of the industry while assuring the sanctity of societal rights, operational practices need to be streamlined to address some of the ethical concerns that arise with drone use. To create such a framework, it is necessary to engage with each component of the drone ecosystem. We believe that beginning by engaging with funders and impacted communities would be most likely to lead to industry-wide reform.

Creating an adaptable and contextually relevant ethical framework, that is also straightforward and inexpensive to implement, will be key to making this attractive to the industry. Compiling use cases of ethical drone operations globally, and disseminating them through workshops and engagement sessions targeted at specific segments of the drone industry would be essential to promulgating this knowledge.

When a framework is created, transparency, reflexivity and accountability must be incorporated into the process in order to ensure that the ethical standards serve the purpose for which they are being created. Finally, while engagement strategies differ for each industry segment, it is important to consider each stakeholder of the drone ecosystem, their needs and concerns and bring them all onto the same page to create a mutual understanding of what we, as an industry and a society, consider to be acceptable and ethical drone use.