

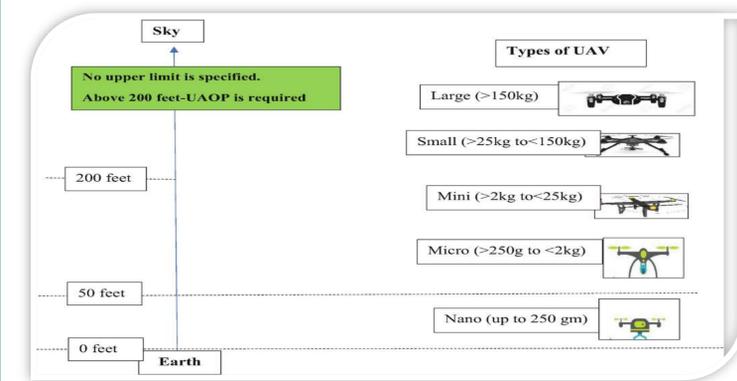
Abstract

The agriculture sector is being advanced by various information and advanced technologies, such as Civilian UAVs called as “Drones”. In India, there are new and existing drafts and policies made by the Directorate General of Civil Aviation (DGCA) and Ministry of agriculture and farmer welfare (MoA&FW) for deploying the UAVs in agriculture. Also, there are diverging views on the future use of UAVs in terms of final outcomes, effectiveness, and information symmetry. Hence, the new and existing policy outcomes are different because this network has evolved over the period of time. This paper’s objective is to analyse the policy network in the deployment of civilian UAVs in Indian agriculture. The objective is followed by two research questions, what are the different kinds of actors who work together in this network, and how do these mutually dependent actors within this policy network help in the deployment of civilian UAVs in Indian agriculture? To identify the stakeholders as interviewees and collect the qualitative data, a snowballing sampling technique was employed and in-depth interviews were conducted in-person or by using zoom. This research agenda not only provides ample scope for understanding the policy network but also its shape and identity in the process of deployment of civilian UAVs in Indian agriculture.

Background

- The agriculture drones market is expected to grow from USD 1.2 billion in 2020 to USD 5.7 billion by 2025 at a CAGR of 35.9% from 2020 to 2025 (MarketsandMarkets,2020).
- Indian civil UAVs industry and market would be around US\$ 885.7 million, while the global market size will touch US\$ 21.47 billion by 2021 (Economic times, 2018).
- The technology is in its developmental phase in India.
- Fixed-wing, single rotor and rotary-wing UAVs are used for Civilian applications in India (Chamuah & Singh, 2020)

Figure 1.: Types of civilian UAVs in India



Source: (Chamuah & Singh, 2020)

- Policy network is one of a cluster of concepts focusing on government links with, and dependence on, other state and societal actors (Rhodes,2008).

Research Objective

- To analyse the policy network in the deployment of civilian UAVs in Indian agriculture

Research Question

- What are the different kinds of actors who work together in this network
- How do these mutually dependent actors within this policy network help in the deployment of civilian UAVs in Indian agriculture?

Methods And Materials

Tools and techniques of Data collection

- Literature survey questionnaires: Set of open ended questions which is based on the objective and research question of the study.
- Semi-Structured Questionnaire-based Survey
- Unstructured interviews: In March 2022, Drone Mahotsav (festival) was visited which was held in Delhi
- Questionnaire-based Interview: It can be carried out face to face, telephonic and through the Zoom.

Table 1:List of respondents which are interviewed during survey

Type of Respondent	Organisation/ Institute/ Ministry /Company	Location	Mode of interview
Government of India	•Mahalanobis National Crop Forecast Centre (MNCFC)	New Delhi	Offline
	•North East Centre For Technology Application and Reach (NECTAR)		
Government of Rajasthan	•Director-General of Civil Aviation (DGCA)	Jaipur	Offline
	•Pant Krishi Bhawan		
Private companies	•Rajasthan Agriculture University	Maharashtra	Online
	•Aeronica company		
	•Padmanabhinovation LLP		
	•Iotechworld aviation	New Delhi	Offline

Discussion

- Formulation of regulations for flying civilian UAVs in India is majorly done by DGCA.
- MA&FW is another body that plays important role in drafting SOPs which is mandatory and are implemented by state agriculture department and research institutes.
- Drone Policy 2.0 mentions and discusses the role of Quality Control of India (QCI) which was missing from the previous policy 1.0.
- Various other stakeholders like insurance companies, state agriculture universities and agriculture departments, FPOs, custom hiring centre (CHC), scientific organisations like MNCFC, NECTAR, Skymet, DFI Pilot training schools, state departments, etc. are working together in Policy network to responsibly deploying Civil UAVs in Indian agriculture

Conclusion

- It shows that there exists an interlink between different sectors like the MoA&FW and the Ministry of Civil Aviation.
- These actors are interdependent and policy emerges from the interactions between them.
- The co-evolution and inclusion of stakeholders are important in the policy network.
- MCA and MoA&FW form the core group of lead players in the entire policy network of Indian agriculture

Limitation of study

- Due to the ongoing pandemic, number of respondents and the quality of feedback both have reduced. Request for In-person interviews get declined and interviews via digital means are not as effective.

Acknowledgement

- I would like to thank:
- My mentor Dr. Rajbeer Singh for his support.
- All the individuals and government organizations helped me during the field surveys

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