



"UBER FOR TRACTORS" CONCEPT: PROMOTING INCLUSIVE AGRICULTURAL TECHNOLOGIES

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INTRODUCTION

The accessibility of agricultural technologies is crucial for ensuring sustainable and equitable development, particularly in regions where traditional methods like hand tools and animal power persist. The significance of making automation processes inclusive across all types of agricultural producers, including small-scale farmers in developing nations, cannot be overstated. In areas heavily reliant on manual labor or draught animal power, there exists an opportunity to leapfrog into agricultural automation, thereby enhancing productivity and positively impacting livelihoods. Creating accessible and neutral-scale technologies is essential, achieved through innovative cooperatives, associations, or market methods that address scale limitations faced by small-scale agricultural producers. For instance, rental services for expensive and complex farm machinery, including tractors, can be facilitated through cooperatives or digitally enabled platforms. An example is the "Uber for Tractors" program, allowing farmers to access machinery through a convenient digital booking system.

The foundation of automation lies in digital technologies, encompassing robotics and artificial intelligence. Governments play a pivotal role in advocating for broader access to

these technologies. This involves advancing necessary infrastructures, establishing suitable legal frameworks, and facilitating the development of knowledge and skills among farmers. To achieve this, a collaborative effort between governments and farmers is imperative. Recognizing the positive impact of digital technology adoption on the economy, society, and environment is the first step. Ensuring accessibility, inclusivity, and adaptation to local conditions should be prioritized to reach a diverse range of potential beneficiaries. This approach is crucial for preventing the exacerbation of technological gaps that could disproportionately affect vulnerable groups, including women, and rural areas. Embracing digital technologies in agriculture is not just a technological advancement but a pathway toward more sustainable, efficient, and inclusive agricultural practices.

Transforming Challenges into Opportunities

The innovative idea of developing an "Uber for tractors" holds the potential to address several key challenges in agriculture, turning them into opportunities for enhanced efficiency and accessibility. This concept involves creating a digital platform that connects farmers requiring tractor services

with available tractor operators, offering a range of benefits:

- 1. Efficiency Enhancement:** The platform facilitates quick connections between farmers and tractor operators, ensuring timely completion of essential farming tasks, particularly during peak seasons. This efficiency can significantly impact overall agricultural productivity.
- 2. Access to Machinery for All:** Small and medium-scale farmers, who might not own expensive tractors, gain access to vital machinery for their fields. This democratization of access to agricultural equipment supports a more inclusive and sustainable agricultural sector.
- 3. Cost-Effectiveness:** Farmers who do not require a tractor year-round can benefit from a more cost-effective solution. Renting a tractor when needed, rather than investing in purchasing and maintaining equipment, can lead to significant cost savings.
- 4. Increased Productivity:** Timely access to tractor services ensures that crucial farming activities such as plowing, seeding, or harvesting are completed on schedule. This can contribute to increased overall farm productivity.
- 5. Income Generation for Operators:** Tractor operators can leverage the platform to expand their services to a broader market. This has the potential to increase their income by utilizing their equipment more efficiently and serving a larger customer base.
- 6. Technology Integration:** The platform can incorporate advanced technologies for efficient scheduling, real-time tracking of services, and secure payment systems.

This integration enhances the overall user experience, making the process more streamlined and user-friendly.

The "Uber for tractors" concept exemplifies how technology can be harnessed to address longstanding challenges in agriculture, fostering a more connected, efficient, and economically viable farming ecosystem. This innovative approach not only benefits individual farmers and tractor operators but contributes to the sustainable development of the agricultural sector as a whole.

CUSTOM HIRING CENTERS APP

The Indian government's introduction of a mobile application for the rental of farm equipment marks a significant step in addressing the challenges faced by small and marginal farmers. Similar to the concept of Uber for taxis, this app connects users with over 38,000 Customer Hiring Centers (CHCs) across the country, providing approximately 2.5 lakh machinery equipment for rent annually. Positioned strategically within 5, 20, and 50 km of farming areas, these CHCs offer a diverse range of equipment displayed on the app along with associated fees. CHCs, functioning as collections of farm machinery and tools available for rent, aim to bridge the financial gap preventing small farmers from outright equipment purchase. The geographic positioning of CHCs, within a 5 to 7 - 40 to 50 km radius around land holdings, serves to minimize the cost and duration of transporting agricultural machinery. The government's 'Custom Hiring' model, coupled with the private sector's 'Uberization,' introduces revolutionary approaches to offer farmers affordable access to farm machinery, including harvest combines and tractors, along with

operator services. As the average farm size in India continues to decrease, particularly among marginal and small holdings, traditional mechanization becomes economically challenging. The 'pay per use' basis of these models enables farmers to access innovative technologies without substantial upfront investments. This transformative shift holds the potential for increased agricultural output, higher farm income, reduced production costs, minimized postharvest losses, and enhanced efficiency through the optimal utilization of new machines. Moreover, these models contribute to the overall sustainability and development of the agricultural sector.

The Hiring Model (Figure 1) is a result of the evolution of the Indian government's 'Sub-Mission on Agricultural Mechanization (SMAM) Scheme,' which was initiated in 2014-15 under the umbrella of the 'National Mission on Agricultural Extension & Technology (NMAET).' The primary objective of the scheme was to extend farm mechanization to marginal and small farmers, as well as areas with limited access to farm machinery, ensuring the availability of high-cost machinery for smallholder farmers. To support this initiative, the federal government endorsed the establishment of Custom Hiring Centers (CHCs) to provide agricultural machinery hiring services. The government committed a financial aid level (subsidy) of 40% of the machine cost to farmers, firms, and societies aiming to establish these CHCs. These centers are required to cover a minimum of 10 hectares per day and a total of 300 hectares per cropping season. Additionally, the government incentivizes the construction of high-tech centers by offering a 40% subsidy on the machine cost, encouraging the use of

advanced, high-value machines for enhanced production. These high-tech hubs must cover at least 500 acres each planting season. Furthermore, the government provides an 80% subsidy to stimulate the establishment of farm machinery hubs, also known as farm machinery banks, in specified locations for custom hiring. These hubs should cater to a minimum of 8 farmers per hub/bank. Maintenance and training assistance are offered to established CHCs and hi-tech hubs by 14 Krishi Vigyan Kendras (KVKs), manufacturers, Agricultural Technology Management Agencies (ATCs), and Indian Council of Agricultural Research (ICAR) centers. This comprehensive support system aims to promote the efficient use of farm machinery and technology in agriculture.

Conclusion

The concept of an "Uber for tractors" presents a promising solution to the resource and operational challenges faced in agriculture. By establishing a platform that connects farmers in need of tractor services with available tractor operators, this innovative model streamlines the process of accessing agricultural machinery. Farmers can easily request tractor services for various tasks such as plowing or planting, and nearby tractor operators can efficiently fulfill those requests. This approach not only enhances the efficiency of farming operations but also addresses the cost-effectiveness and accessibility issues, especially for small and medium-scale farmers who may not own expensive tractors. Overall, the "Uber for tractors" model emerges as a valuable solution that benefits both farmers and tractor operators in the agricultural sector.

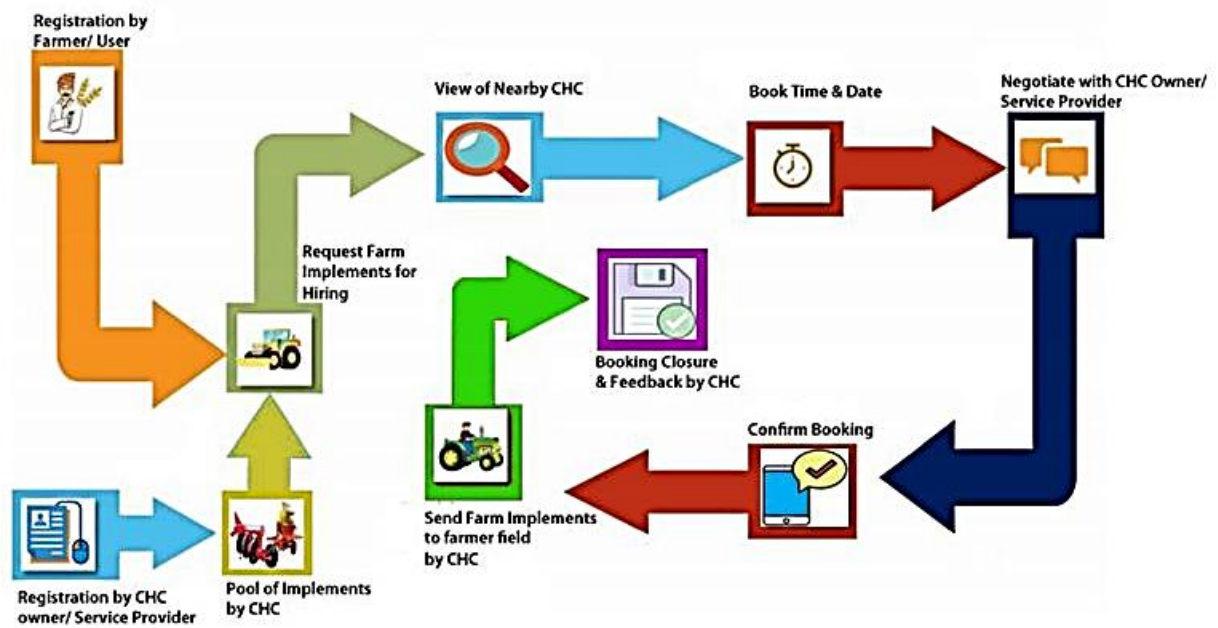


Figure 1. Process flow of hiring model