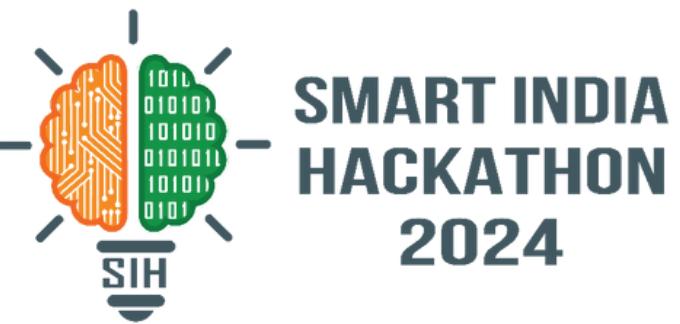


SMART INDIA HACKATHON 2024



- **Problem Statement ID – 1536**
- **Problem Statement Title-**Student Innovation
- **Theme-**Agriculture, FoodTech & Rural Development
- **PS Category-** Hardware
- **Team ID-**IH-04
- **Team Name-** KRANTI
- **Youtube Video-[link](#)**



IDEA & APPROACH

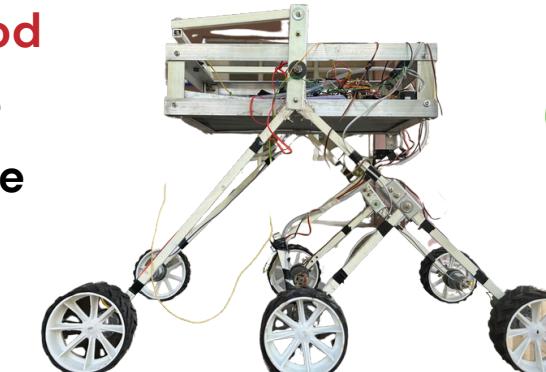
कृषक Mitra

- The proposed solution is a multi-terrain rover, Krishakmitra, designed to perform various agricultural tasks in a more efficient and safer manner.
- With an adjustable height and width, Krishakmitra is a versatile tool enough to spray as well as sense crop's health at any stage of growth, adapting to various farming conditions.
- Farmers can remotely operate the rover to spray fertilizers and pesticides, eliminating the need for direct exposure in the field.
- Krishakmitra is equipped to handle activities, from physical tasks like fertilization and sowing to precision-based operations such as soil moisture sensing and crop health monitoring.



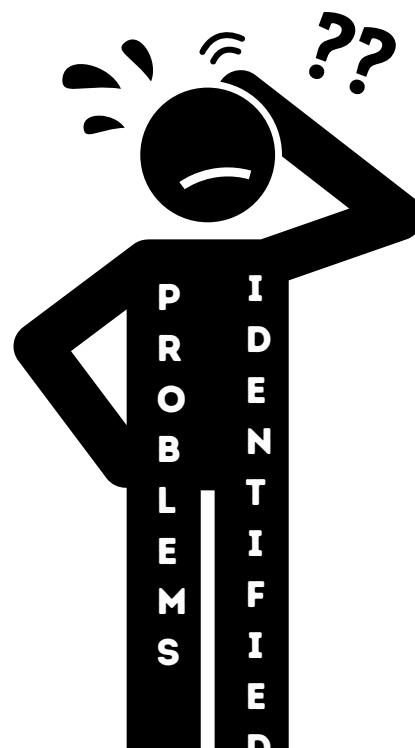
Traditional method

- Labour intense
- Direct exposure to harmful pesticides



KrishakMitra

- Remotely controlled
- Multiple spraying options
- Adjustable height and width
- sensing and monitoring features
- Higher payload(upto 10kgs)



Direct exposure to harmful pesticides and fertilizers



Terrains Limitations

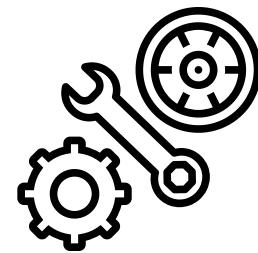


Variable crop height and density

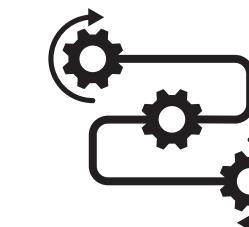
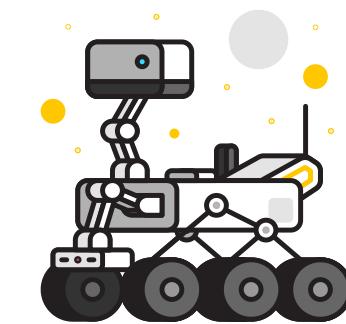
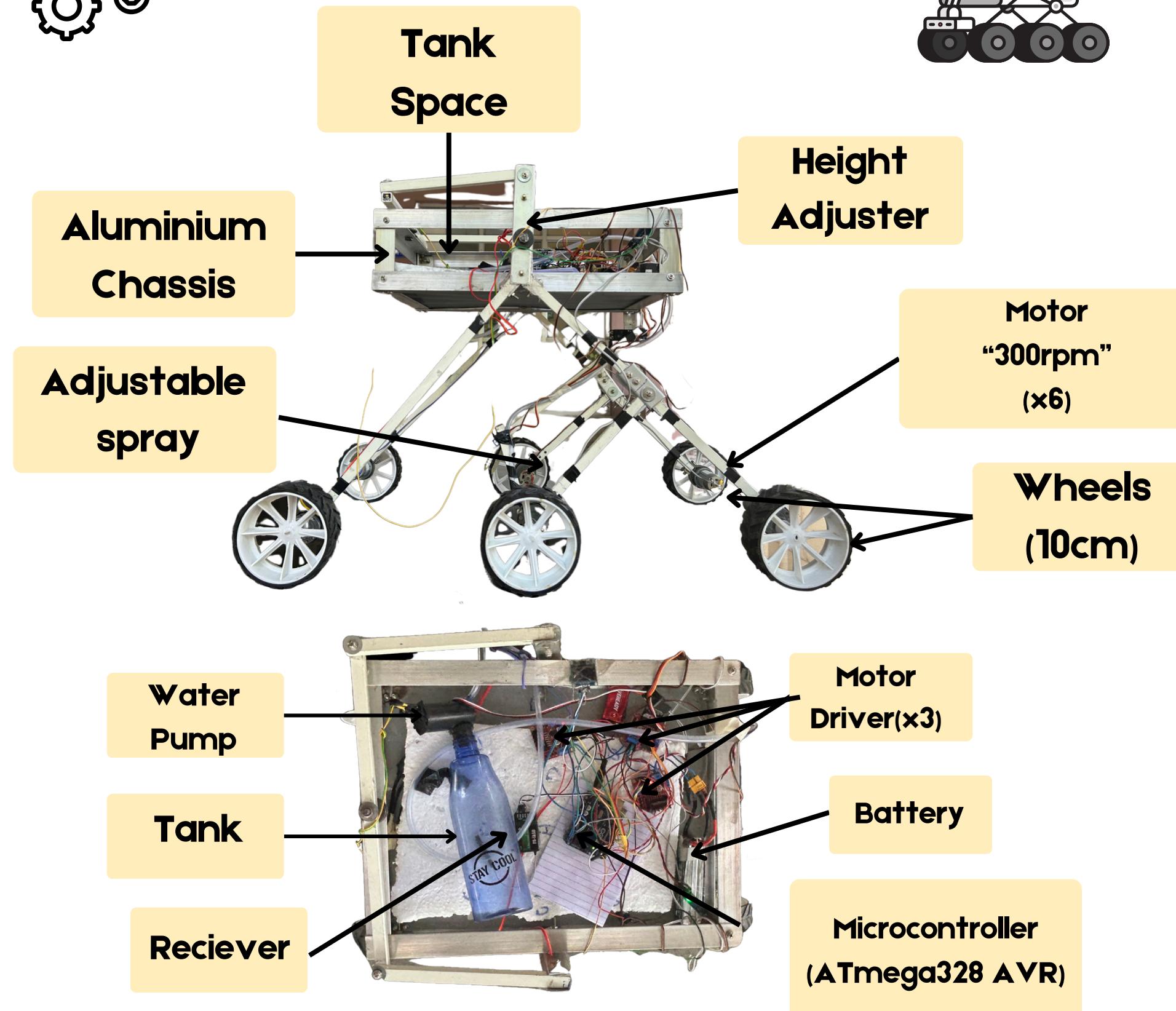
Future Goals

- ❖ PCB design instead of Arduino
- ❖ Making it feasible for both small scale as well as large scale farmers
- ❖ Add an attachment for automated seed sowing
- ❖ Laser weeding
- ❖ Drone Refueling

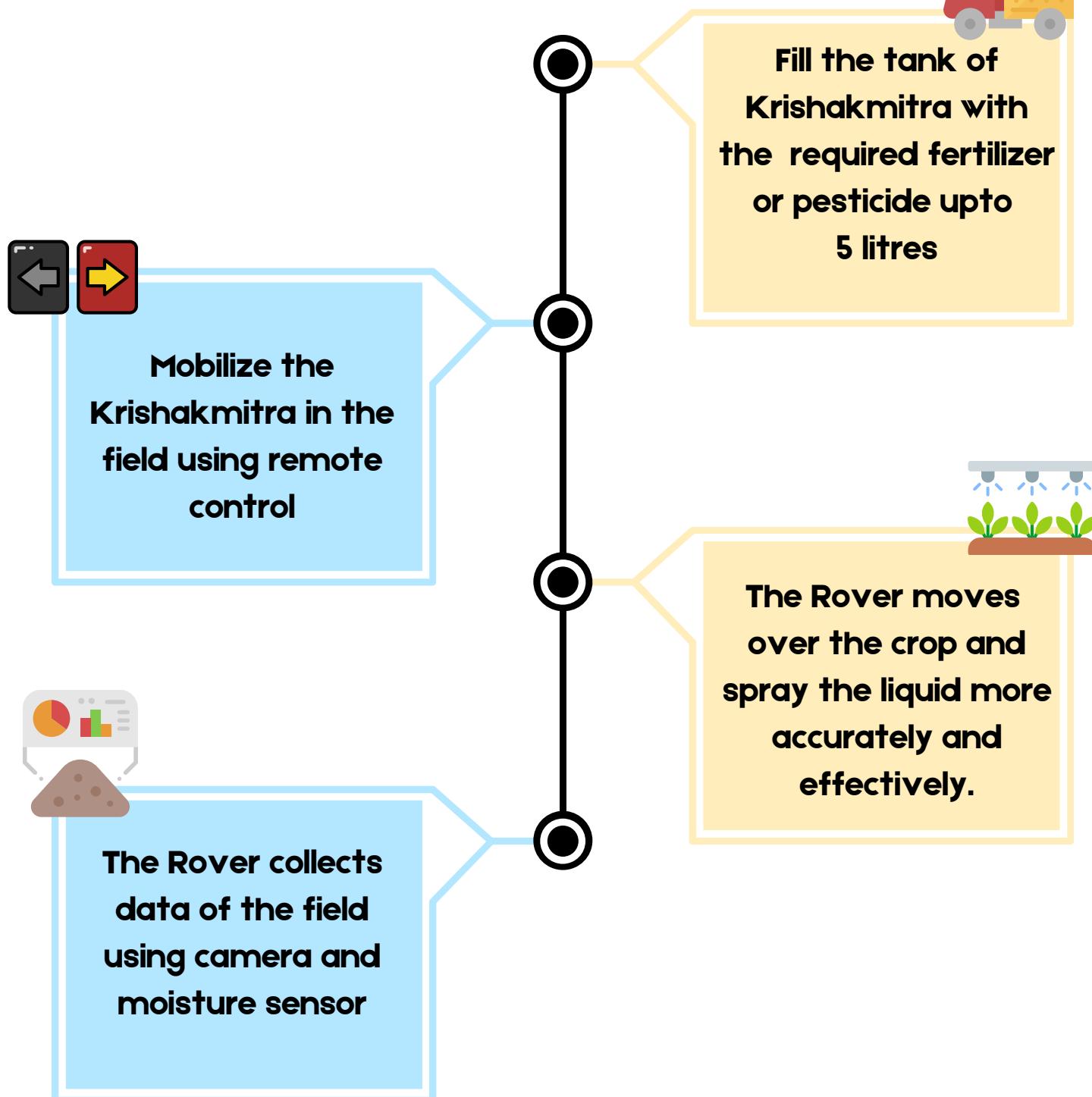
Module Design



Parts and Specifications



WORKING OF THE KRISHAKMITRA



Feasibility and Viability

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Market Demand :

Small-scale farmers require affordable, automated solutions to reduce labor and increase efficiency.



Sustainable Power Source :

The rover's fuel-free operation aligns with current advancements in renewable energy .



Cost-Effectiveness :

The rental model offers affordability, accessible to farmers who might not be able to invest in expensive machinery.

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Customizable Design

configurable for different farm and landscapes demonstrating practical use across a wide spectrum of agricultural climate.



Health and Safety Appeal :

Reducing exposure to hazardous chemicals through automation solves the health issues faced by farmer.



IMPACT AND BENEFITS

ENHANCED CROP HEALTH

Studies by Fertiliser Association of India suggest that about 20-30% of total crop production is lost due to inadequate fertilization and pesticide mismanagement. Krishakmitra is designed to solve this problem with **variable and precise spraying technology**.

COST EFFICIENCY

Labor costs form a significant portion of a farmer's total expenditure, often comprising around 25-40% of total costs for small to marginal farmers. **our model reduces about 50% of the overall manual labour cost.**

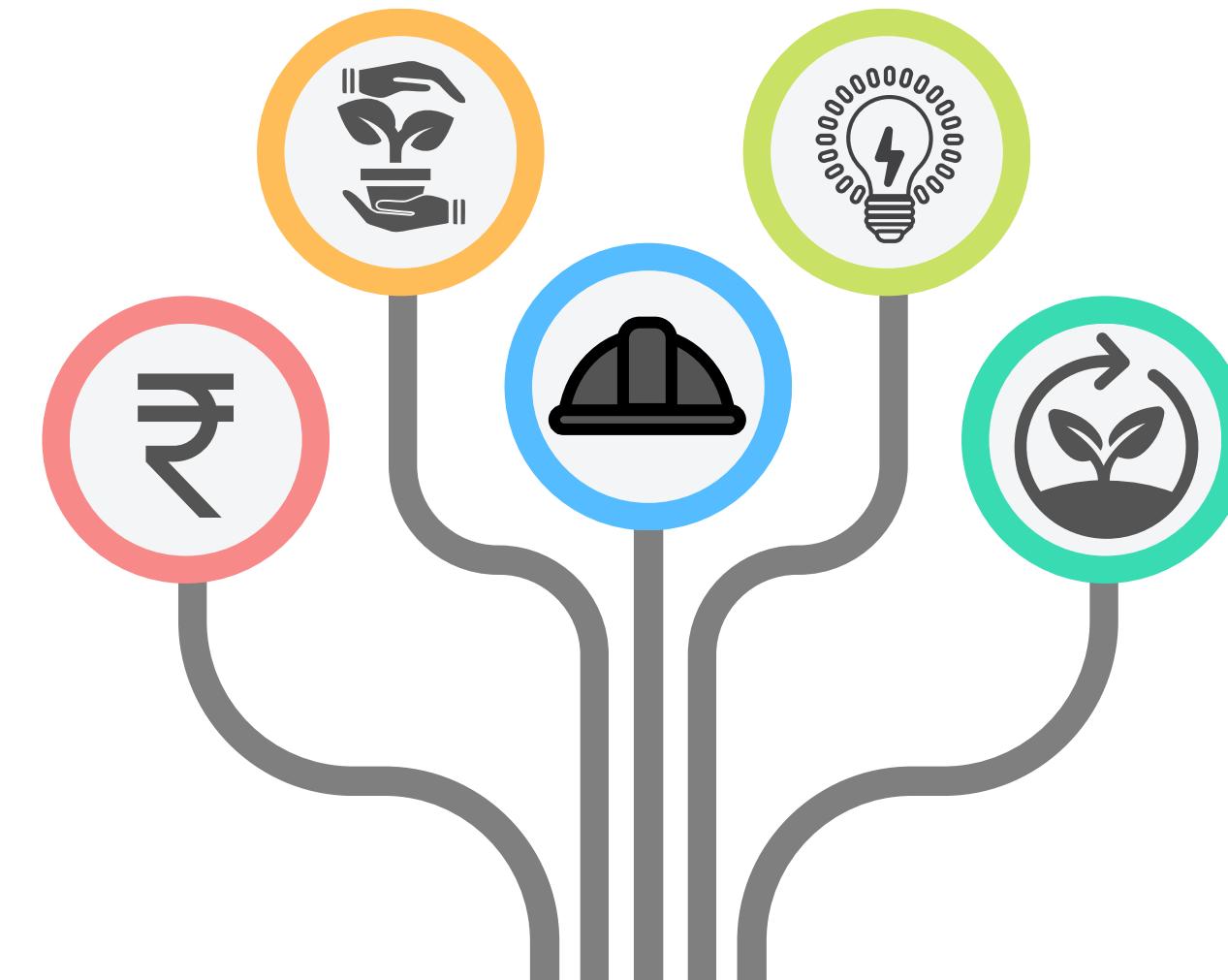
OCCUPATIONAL SAFETY

Research indicates that approximately **44%** of farmers experience pesticide poisoning annually, which includes health problems like dizziness, skin burns, respiratory issues, and even long-term effects like **cancer and neurological damage** (Council on Foreign Relations)

With our **remotely controlled** model farmer can handle harmful substance without **direct exposure** to them.

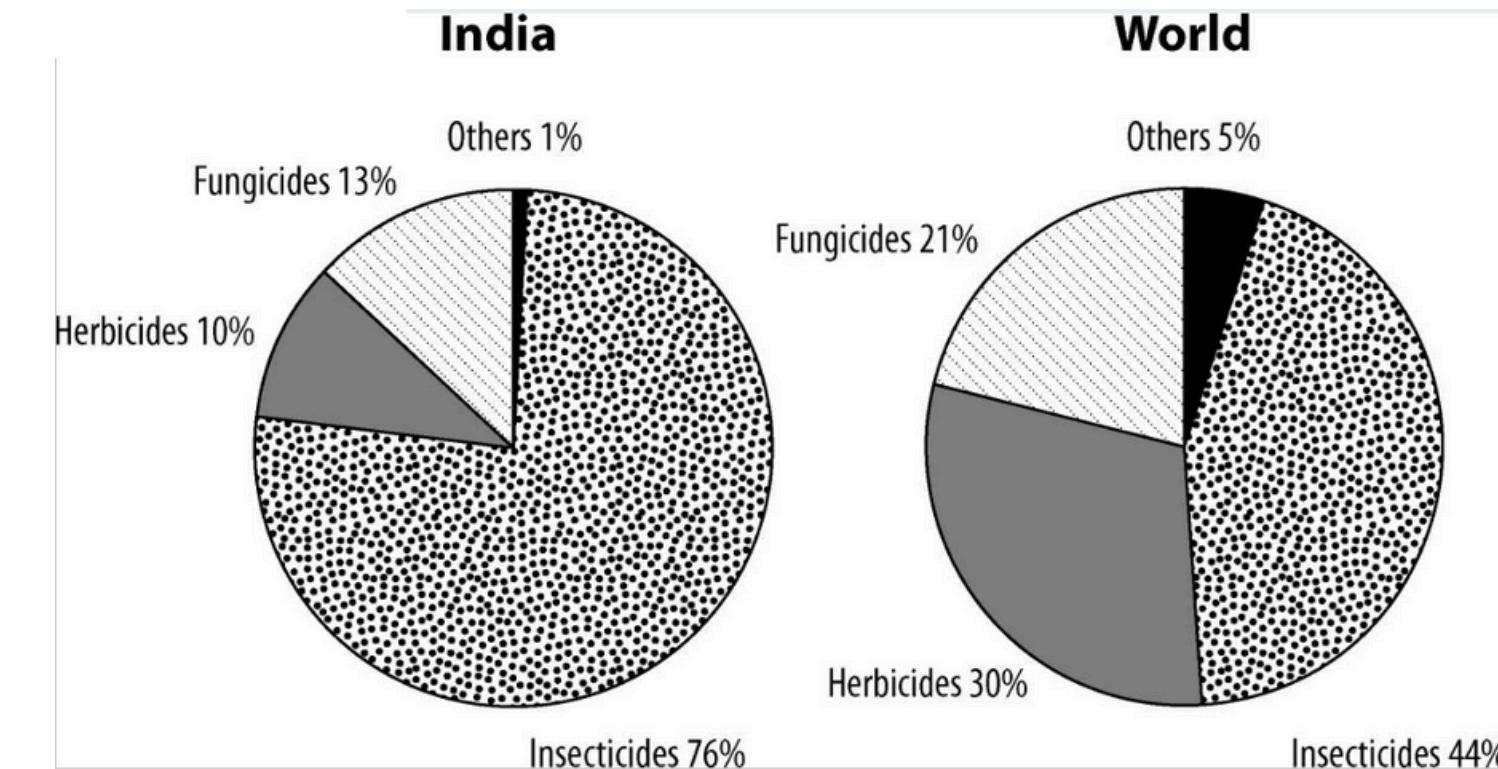
INNOVATION

Constant innovations in this model makes it more adaptable and refined. Represents a commitment to cutting-edge agricultural technolog



SUSTAINABILITY

Krashakmitra uses fuel-free operation aligns with current advancements in renewable energy and green technology mechanization, contributes significantly to environmental pollution, with estimates suggesting that agriculture could be responsible for up to 25% of total global pollution in some sectors.



Pesticide Usage Pattern in India:

- India has a different pesticide usage pattern compared to the global average.
- Insecticides account for the majority (76%) of pesticide usage in India, while globally it's only 44%.
- Herbicide and fungicide usage is lower in India compared to globally.

Primary Pesticide Use in India:

- Cotton crops consume the most pesticides (45%).
- Paddy and wheat are the next major consumers of pesticides.

Environmental and Water Pollution:

- Chemical fertilizers and pesticides have caused environmental and water pollution problems.
- Food, water, and the environment are the primary sources of human exposure to these chemicals.
- These exposures can indirectly or directly affect human health.

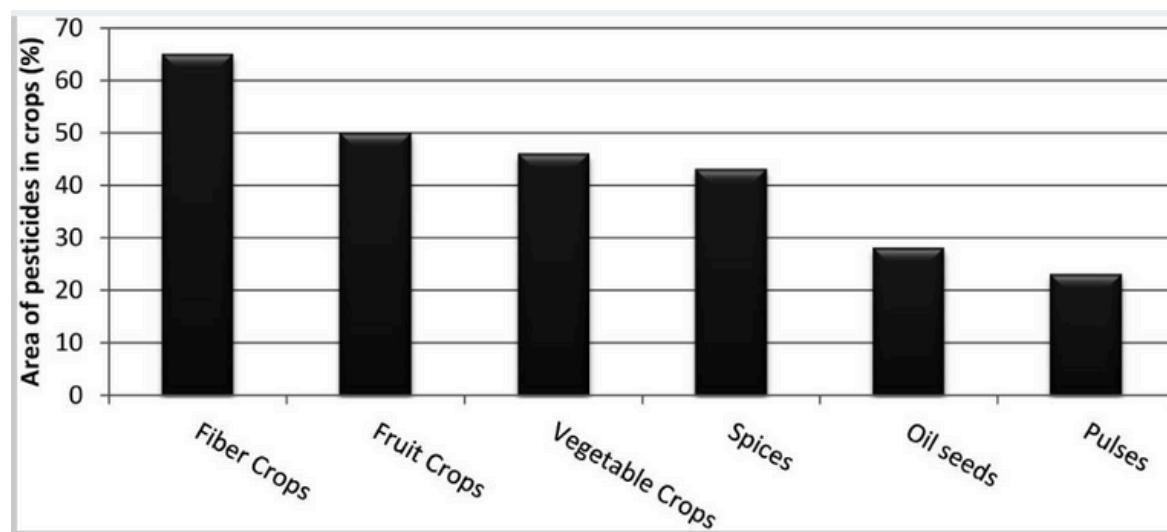
References

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<https://extension.psu.edu/potential-health-effects-of-pesticides>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2984095/>



Youtube Video Link-<https://youtu.be/lBbUzNfoC-A?si=obGmy4G2a42EfGAm>

Drive link-https://drive.google.com/drive/folders/1-Tju_1n7qQKoM3SlqUxfNUjKQErxzko

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