



Insights from actual world wide Ag-Robotics as to develop small and medium scale farming in Emerging, Southern and Asian Countries

General Plan



1. Context for small to medium scale farming in Emerging , Southern and Asian countries
2. Insight from the market : Robots already sold world wide
3. Insights to develop Ag-Robotics in small to medium farms in Emerging, Southern and Asian countries

PART 1

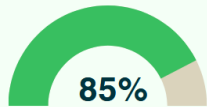
Context on Small to Medium scale farming in emerging , southern and asian countries



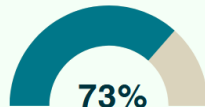
Small and medium farming

- Smallholder farmers = 80% total farms produce + 70% of the world's food on just 33% of the world's Agricultural land*

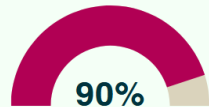
CONTRIBUTION OF SMALLHOLDER FARMERS TO THE WORLD'S KEY CROPS.



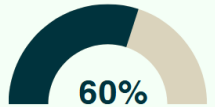
The bulk of world banana production (almost 85%) comes from small farms. [151]



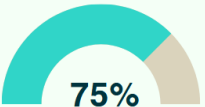
Globally, around 73% of all coffee is produced by smallholder farmers. [152]



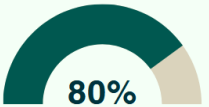
Over 90% of cocoa growers are smallholder farmers. [153]



More than half of the tea produced globally (60%) is grown by smallholder farmers. [154]



Smallholder farmers are estimated to produce over 75% of the world's cotton. [155]



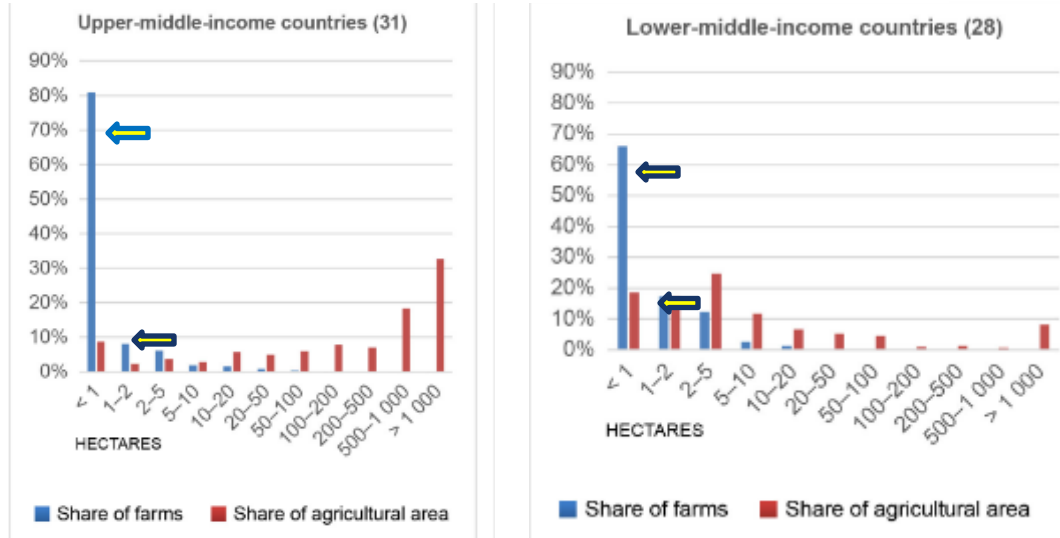
About four-fifths of the world's rice is produced by small-scale farmers. [156]

Virginia Enssle 2025 Fair trade advocacy office

- Medium farming is around 5ha

- Small Farms are usually less 2ha ; including family farming with labor provided by family – FAO . they represent up to 80% of farm number

Average distribution of farms and farmland area by land size class and income group



* Lowder, S.K., Sánchez, M.V. & Bertini, R. 2019. *Farms, family farms, farmland distribution and farm labour: What do we know today?* FAO Agricultural Development Economics Working Paper 19-08. Rome, FAO.

Small and medium farming

Main Crops & Cattle



- **Rice**
- **Casava** / Manioc
- **Lens, Bens..**
- **Copwea** / Niebe
- Maïze
- Banana
- Sugar canne
- Coffee, Cocoa
- Oil seed
- Cotton
- Vegetable and fruits
- ...
- Dairy & meat cattle

Opportunities



- **Diversity of crops** : often 3 crops a year & **Mixed crops + Agroforestry**
- Strong **support from state** for food sovereignty in some countries
- **Diversification** : more vegetable, more lens, beans, small cattle
- **Growing** part in **exports** in world commodity trade
- **Succes of Digital & Drones**

Challenges



- Growing population and **food sovereignty** challenges
- **Climate change** with more frequent disorders & Water scarcity & pests
- **Access to finance** & markets
- **Labour shortage**
- **Land fragmentation** in very dense countries, (China, India...)
- Low **mecanisation rate** : ex : India ; africa
- **Often mountainous areas**, and heroic cultivations



PART 2



Insight from the actual robotics market

*Commercialized robots
worldwide*



How to develop an innovative market ?

Economic model



- In Europe & US, trend on **collective use of the machine / Robotics as a service / Raas**
- **Early stage innovators**
- Test, training references for farmers
- Strong need for fast After sale service

Legislation



- **Europe and Japan** have the **highest safety regulation** :
- In Europe Machine Regulation 2023/1230 coming into force in 2027 + AI Act + Cyber Resilience Act (CRA) + Data

Benefits for farmers



- **Ressources preservation** & agroecology & climate change
- **Labour** issues & painfull task most of the time adresssed
- **Yet to come** : System reconception and enhancing nature biological positive impact

Mechanical Weeding as the first task

- Mechanical Weeding



In competition with automation + tractor



Both Spot spraying

Laser weeder

- Sowing



*prototype

- Irrigation (Potatoes)



Some Other task on labour intensive crops

- Spraying



- Tillage



- Transportation



- Harvesting at the beginning



*prototype on berries



Asparagus

Indoor crops with innovative tech

- Harvest (advanced prototype)
- Leaf stripping (tomatoes)



- Monitoring & natural action



UV for mildew treatment



Bug vacuum on strawberries

Vineyards as the first market

Vineyards is the first market with a strong offer

- **Vegetable** : Growing options and competition with AI precision equipement + tractors



Some Versatile or specific machines

Small Versatile robot for tilling , seeding, transportation, spraying
Ranging from 15 K€ to 50 k€



Rice : rice transplantation



Combined Monitoring



Mobile machines for Cattle & Poultry

- Cattle** : a more mature market with growing nb feeding & handling machines*



Poultry



PART 3

Developing

Robotics in small & medium Farming



What about price & use compared to tractors ?

Robot of the Year 2025 INDIA

15 K€

50 units sold, price should lower



Tractor INDIA 40HP 2wd

7.5 K€



Versatile robot

- weeding, tillage, seeding , spraying
- monitoring
- transportation ...

Robotics for small & medium farms

Key
takeaways



Economic model

Collective use is key



Adoption by farmers

Financial & technical support first

- Adequate ROI & after sales service
- Capitalise on Digital, Drones, IOT success



DEEP FARM

- Listen to farmers' knowledge to reproduce and enhance biodiversity
- Both automation and Robotics will drive evolution
- What about women role and empowerment in robotics ?

Some Robots produced in emerging countries



- Private –Government projects

Thank you for your attention

Any question : Let's talk about it

sduran.fr@live.fr

