



# Cutting Edge Technologies in Agricultural Mechanization in Nepal

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**The 11<sup>th</sup> ReCAMA Member Meeting**

**25 October 2025, Wuhan, China**



[www.nameanepal.org.np](http://www.nameanepal.org.np)



### Brief Overview of NAMEAs:

- **NAMEA: The Engine of Mechanization in Nepal**

“NAMEA is Nepal’s central body for Agri-Machinery entrepreneurs, with 450 members including manufacturers, importers, and distributors.”

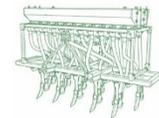
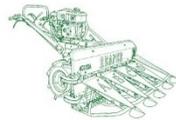
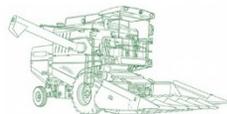
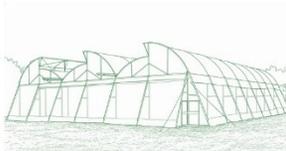
- **Our mission:** To promote sustainable agricultural mechanization, support entrepreneurs, and bridge the gap between farmers, manufacturers, and policymakers.
- **Key activities:** Advocacy, trade fairs, training, knowledge dissemination, and facilitating partnerships.
- **Key Role:** We bridge the gap between government, private sector, and farmers.

### General Overview of Agri-Mechanization in Nepal:

- “Nepal’s agriculture is characterized by small landholdings and diverse topography, from the fertile plains of the Terai to the challenging hills and mountains.”
- Traditional methods are gradually giving way to mechanization, starting with basic equipment (tillers, threshers) and now moving towards smarter technologies.
- The focus is on increasing yield, reducing drudgery (especially for women), and improving post-harvest management.

#### The Nepalese Context:

“Our challenge and opportunity: adapting global technology to one of the world’s most diverse topographies—from the flat Terai plains to the steep Himalayan hills.”



# Status of Mechanization (2021/22)



## Land Holdings

Description	Number	Area (ha)	Wet (ha)	Dry (ha)
Holdings without land	131,504	8,412.80	5,361.20	3,051.60
Holdings with land	3,999,285	2,209,997.10	1,424,619.40	785,377.70
Total	4,130,789	2,218,409.90	1,429,980.60	788,429.30

## Equipment

Types of Equipment	1991/92		2001/02		2011/12		2021/22	
	Holdings using equipments ('000)	No. of items ('000)	Holdings using equipments ('000)	No. of items ('000)	Holdings using equipments ('000)	No. of items ('000)	Holdings using equipments ('000)	No. of items ('000)
Iron ploughs	315.1	354.5	870.3	890.2	1073.4	856.3	702.8	509.9
Power tillers	5.6	1.6	15.6	11.8	75.7	10.4	471.3	118.0
Shallow tube wells	50.9	48.2	119.7	109.5	367.7	262	490.0	418.8
Deep tube wells	20.1	15.7	58.6	51.5	159.7	82	331.4	228.1
Rower pumps	3.5	3.8	22.7	21.8	79.1	36.2	51.1	22.3
Tractors	35.2	5.5	272.9	150.6	844.7	37.4	1,638.8	58.5
Threshers	85.6	19.9	249.5	129.1	803.1	51.9	1,175.1	114.9
Pumping sets	81.1	41.3	210.4	146.1	548.2	150.3	690.6	399.8
Animal drawn cart	204.6	198.1	226.4	199.1	335	159.9	152.4	73.8
Sprayers	50.2	23.4	203	145.9	574	282.3	1,150.9	770.2

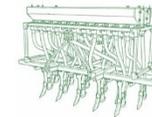
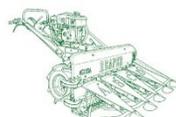
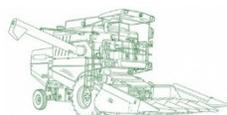
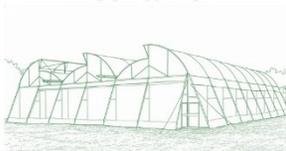
Source: National Sample Census of Agriculture, CBS

## High Adoption in Key Areas:

- “We have a strong base. In the Terai region, over 95% of farms use tractors or power tillers for land preparation.”
- “Threshing is 90% mechanized in the Terai.”

## Technology Penetration:

- “We are seeing rapid growth in specific technologies: over 700 combine harvesters, 2,800 reapers, and approximately 100,000 mini-tillers, with 90% of those mini-tillers transforming agriculture in the Hills and Mountains.”





# Emerging Cutting-Edge Technologies in Nepal

## Precision for Smallholders:

- **Battery-Powered Mini-Tiller (On Trial):** “We are testing eco-friendly alternatives to reduce emissions and noise for small-scale hill farming.”
- **Rice Transplanters:** “Moving beyond manual labor, especially for women. Walk-behind and self-propelled models are gaining popularity in plain areas.”



*Battery Powered Mini Tiller*



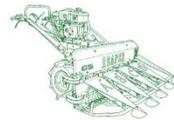
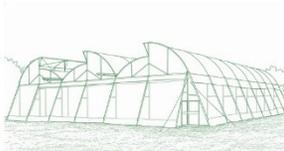
*Walk behind rice transplanter*



*Self Propelled rice transplanter*

## Controlled Environment Agriculture:

**Advanced Polyhouses:** “New designs with adjustable ventilation are enabling high-value cash crop production year-round, boosting farmer incomes.”



## Adapting to Our Conditions:

**Track-Type Combine Harvesters:** “A perfect example of adaptation. These machines excel in our wet Terai fields where conventional wheeled harvesters fail.”



*Track type self propelled combine harvester*

## The Digital Leap:

**Agricultural Drones:** “Now in trial phases by government and private companies like Geovation Nepal. Used for mapping, monitoring, and nascent-stage spraying services—a game-changer for our terrain.”



*Agricultural Drone*



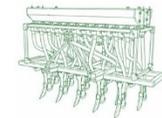
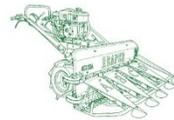
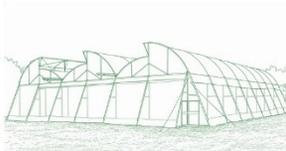
## Supportive Policies & The Collaboration Model

### Government Initiatives:

- **National Agricultural Mechanization Promotion Policy (2014):** Provides the strategic framework.
- **Subsidies & Programs:** Through NAMP and local offices to encourage adoption.
- **Custom Hiring Centers (CHCs):** Making technology accessible to smallholders.

### The NAMEA Collaboration Model:

- “Success hinges on collaboration. NAMEA actively partners with the Government to organize national exhibitions and vital training on repair and maintenance.” riendly alternatives to reduce emissions and noise for small-scale hill farming.”





## Key Challenges & Our Proposals

### Key Challenges

**Topography & Landholding:** Hilly terrain and small plots limit large-scale tech.

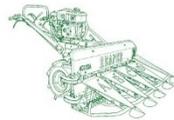
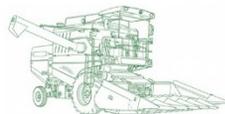
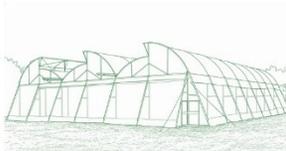
**Affordability:** High initial cost for cutting-edge tech.

**Infrastructure:** Limited rural electricity and service networks.

**Technical Knowledge:** Gap in operating and maintaining advanced equipment.

### Our Proposals:

- **Boost R&D:** Incentivize local manufacturing of terrain-specific machinery.
- **Strengthen CHCs:** Make advanced tech accessible through a “Uber-like” rental model.
- **Enhanced Training:** Scale up skill development programs for youth and technicians.
- **Green Financing:** Create low-interest loan products for eco-friendly technologies.





## Capacity Building by NAMEA: Training People-Building Future

### What We Do:

#### Hands-on Training

- Farmers & technicians
- Machine operation & repair
- Business skills for members

#### Knowledge Sharing

- Exhibitions & demos
- Workshops & seminars
- Training materials

#### Policy Support

- Advocate for farmers
- Support good policies
- Help create service centers

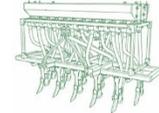
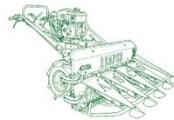
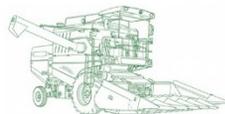
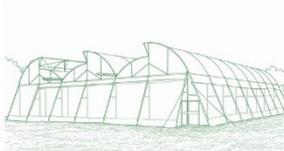
#### Building Networks

- Connect all stakeholders
- Share best practices
- Strengthen supply chain

### Why It Matters:

**Better Skills → Better Machines → Better Farming**

*"We ensure technology reaches the field and works effectively!"*





## Good Case of Cutting-Edge Technologies in Agricultural Mechanization in Nepal

**Case Study:** Transforming Rice Farming Through Custom Hiring Services

**Name:** Nepal Multipurpose Cooperative (NMC) Ltd.

**General Overview :**

**Established:** 1994 A.D.

**Location:** Jhapa

**Members:** 168,047

**Initiative:** Custom Hiring Center for rice transplantation.

**Model:** Hourly machine rental service

**Challenge:**

Labor shortage during peak rice planting season

High costs of manual transplantation

Time-consuming traditional methods

Farmers struggling with low efficiency

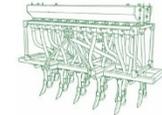
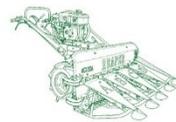
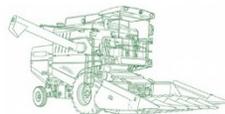
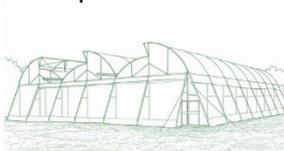
**Solution:**

1. Custom Hiring Center Started with rice transplanters - addressing the most critical bottleneck
2. Hourly rental model - affordable for small farmersOwn farm as demonstration site - proving technology effectiveness
3. Training and support - ensuring proper machine operation



**Impact & Success**

1. Rapid adoption by member farmers
2. 30-50% cost reduction compared to manual labor
3. Time savings - 10x faster than manual transplantation
4. Returning migrants inspired to invest in machinery
5. Created new service-based businesses in the community





## Conclusion & Vision for the Future

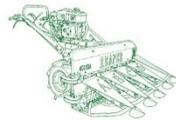
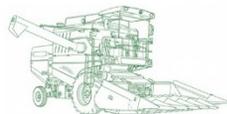
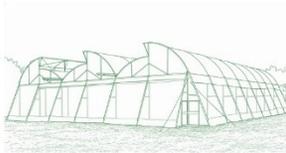
**Our Journey:** “Nepal’s mechanization is on a clear path towards a digital, eco-friendly, and inclusive transformation.”

**The Crucial Element:** “Collaboration among government, private sector, and associations like NAMEA is the bedrock of our progress.”

**Our Future Goal:** “We are working towards establishing a ‘Centre of Excellence for Agricultural Mechanization’ (CEAM) to drive local R&D, innovation, and training.”



**CEAM**





## Thank You !

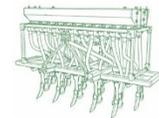
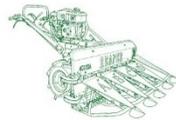
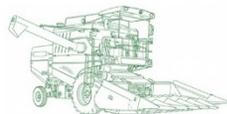
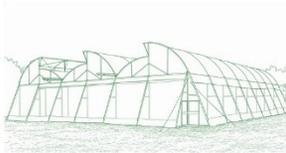
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