CSAM's Regional Initiative on Integrated Straw Management

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About ESCAP-CSAM

- **Regional institution** of United Nations ESCAP hosted in China since 2003
- **Vision:** To achieve production gains, improved rural livelihood and poverty alleviation through **sustainable agricultural mechanization** for a more resilient, inclusive and sustainable Asia and the Pacific.
- Dedicated to promoting **international cooperation and partnership** in sustainable agricultural mechanization.
- Focusing on **Sustainable Development Goals** (SDG) 2 (Zero Hunger), SDG 1 (no poverty), SDG 13 (Climate Action), SDG 17 (Partnerships for the Goals)

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Burning of Crop Residue

Crop residue burning is a serious, **transboundary** concern in many countries in the Asia-Pacific region leading to:

- **Soil deterioration**: negative impact on soil nutrients, pH, moisture, organic matter, fertility
- **Environmental concerns**: Air pollution, transboundary haze, GHG emissions
- **Social impacts:** Public health hazard, transportation disruptions

→ **Residue burning not aligned with sustainable intensification in agriculture**

Key reasons for straw burning

- **High cost** of straw collection, transportation and storage, partially caused by the shortage of rural labour
- **Lack of time** for straw to decompose before next seeding cycle
- **Lack of adequate machinery and techniques** to treat straw residue
- **Low awareness** of the impacts of burning on the environment, food security and health

Picture courtesy: Tribhuvan University, Nepal

What are the reasons for straw burning in Lao PDR?

A. To get rid of pests & diseases

B. High costs to collect, transport, store straw

C. Lack of labour to collect, transport, store straw

D. Lack of machinery to collect, transport, store straw

E. To fertilize the soil for next season

F. Any other reasons?

Alternative Uses of Straw

- Fertilizer (directly or as cow manure)
- Fodder
- New energy resource (briquette fuels, biogas production, carbonization fuel, gasification fuel, degradation and ethanol)
- Base stock (mushroom growing)
- Industry material (papermaking, building material, crafts production, xylitol production)

Fertilizer (mixing w/ soil)

Fodder

Bio-gas

Base stock (mushroom)

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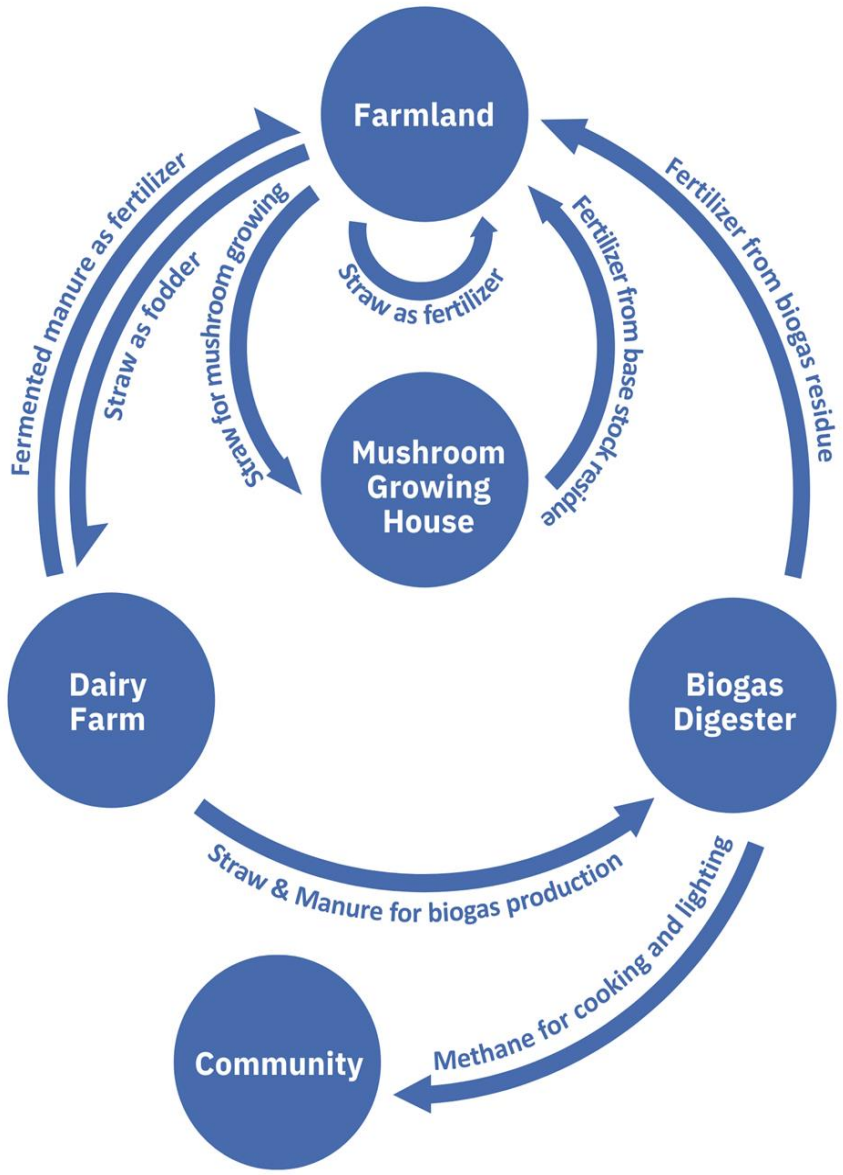

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Circular Model for Straw Utilization

- **Promoting application of agricultural machinery** and practices for sustainable, circular use of straw residue as fertilizer, fodder, substrate for mushroom-growing, and biogas production
- **Priorities for country pilots:**
  - Sensitize stakeholders and **highlight economic & environmental benefits** of sustainable & integrated straw residue management
  - **Incentivize adoption** of sustainable mechanization solutions and encourage **adaptation** to match local needs

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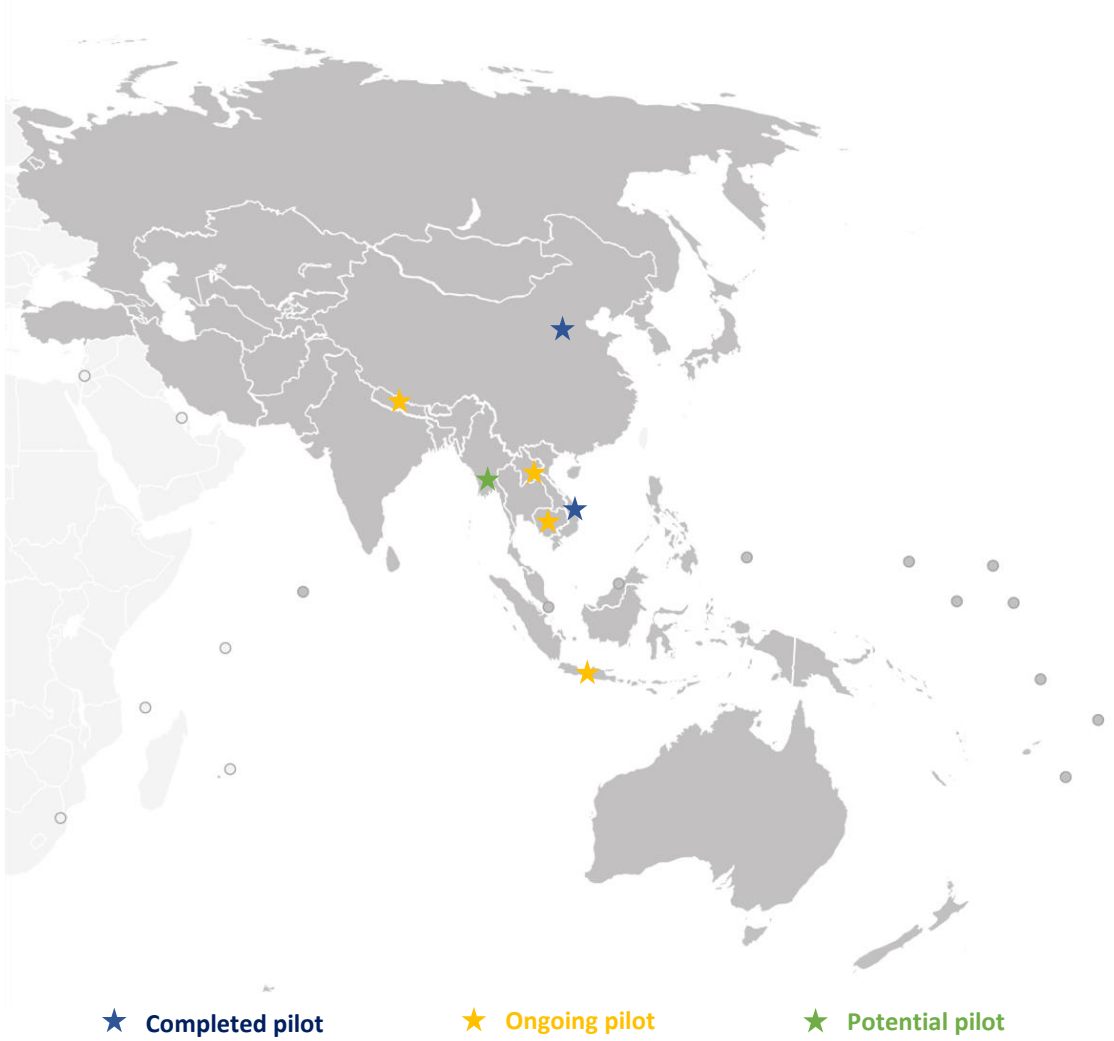
Pilot Projects on Integrated Straw Management



Timeline

- 2018: Pilot project started in China
- 2019: Pilot project started in Viet Nam
  : Regional study tour in India

- 2022: Pilot project started in Nepal (phase I)
  : Pilot project started in Cambodia (phase I)
  : Pilot project started in Indonesia (phase I)
  : Training in China
  : Study tour in India
  : Virtual demonstration of pilot project in China
  : Regional study tour in Thailand
  : RECOGNITION in Good Practices for South-South Cooperation
  : RECOGNITION at ESCAP Innovation Awards!

- 2024: Regional workshop in China
  : Regional study tour in China
  : Pilot project in started in Cambodia (phase II)
  : Pilot project started in Indonesia (phase II)
  : Pilot project started in Nepal (phase II)
- **2025: Pilot project starting in _____!**

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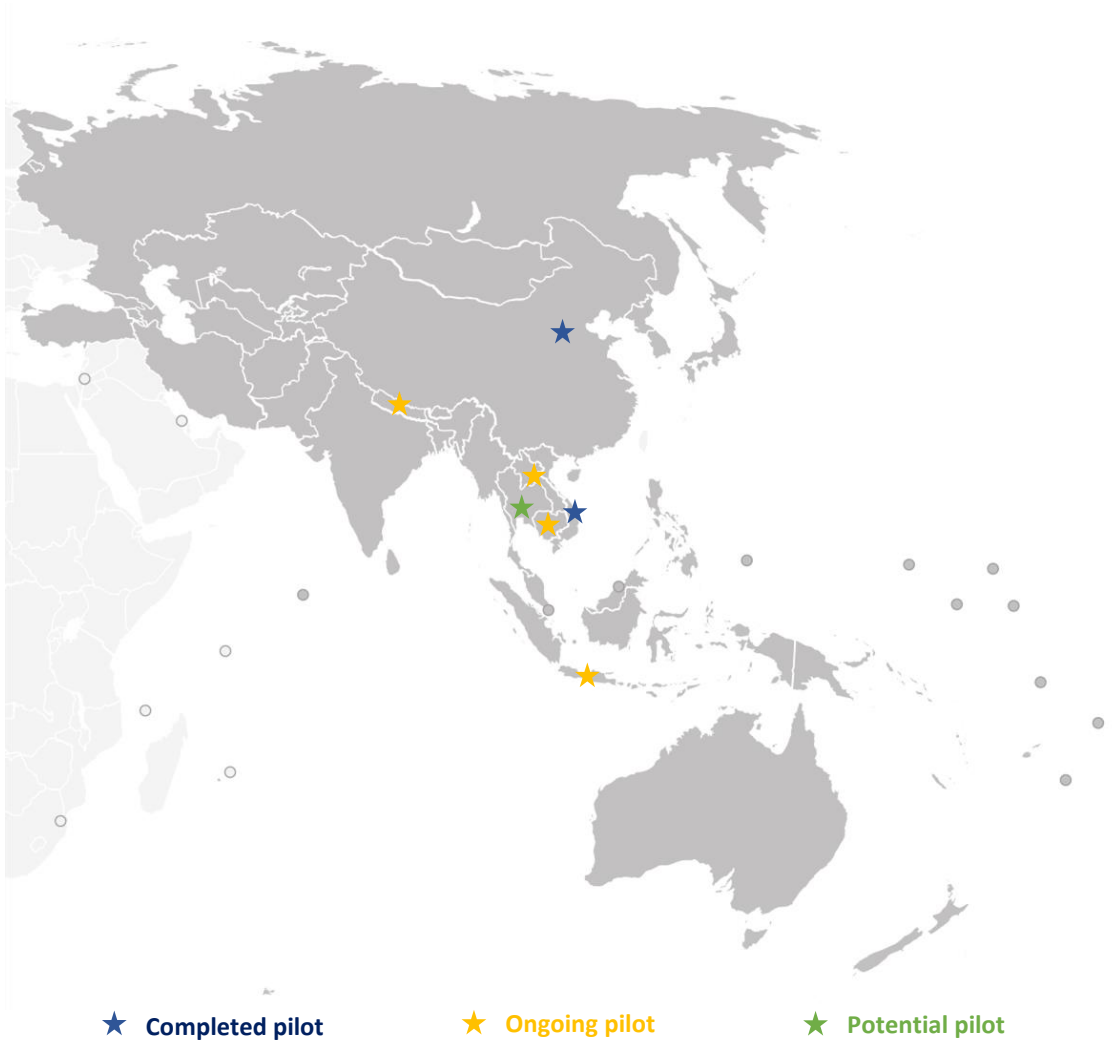
Pilot Projects on Integrated Straw Management



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- **2025: Pilot project starting in LAO PDR!**

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Positive outcomes from pilot projects

- **Agricultural mechanization index was increased** at the pilot locations in Indonesia from 0 - 0.39 horsepower per hectare to 1.32 - 2.46 HP/ha, with accompanying benefits for overall productivity.
- In Nepal, application of the machinery led to **increase in the benefit-cost ratio** from 1.99 (control plot) to 2.59 (experimental plot) implying more profit for the farmers.
- Strong **community engagement and local ownership** of project results by key stakeholders was achieved leading to **increased awareness** of the local farming communities about the harmful effects of straw burning and their **strengthened capacities** to use agricultural machinery to address crop residue burning.
- **Reached a total of 443 farming community members**, among which 38% are women.

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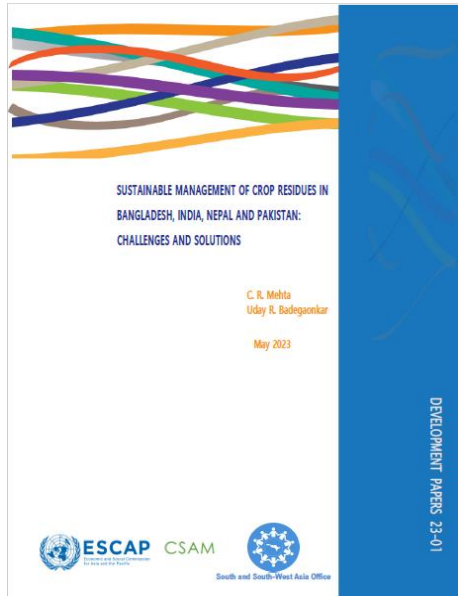

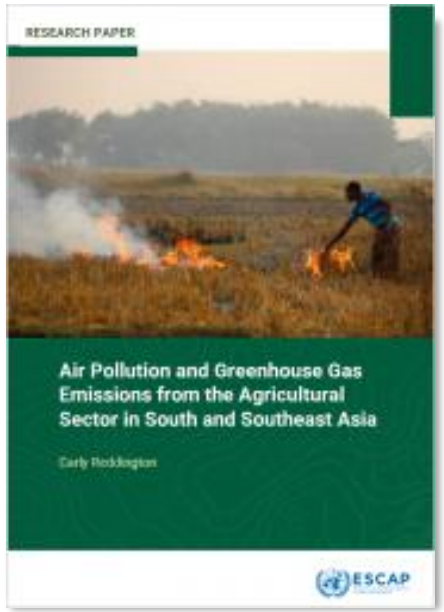

Reference materials related to integrated straw management

- Status of Straw Management in Asia-Pacific and Options for Integrated Straw Management
- Policy Briefs Series on ‘Reducing the Need to Burn: How Applying Sustainable Agricultural Mechanization can Improve Air Quality’ for Cambodia, Indonesia, Nepal, South and Southeast Asia
- Sustainable Management of Crop Residues in Bangladesh, India, Nepal and Pakistan: Challenges and Solutions
- Research Paper on Air Pollution and Greenhouse Gas Emissions from the Agricultural Sector in South and Southeast Asia

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Alternative uses of straw – supported by agricultural machinery – can provide sustainable solutions.

We also need:

- Identification of context-specific alternatives
- Community engagement and local champions
- Local adaptation
- Training and capacity building
- Multi-stakeholder approach
- Regional/international cooperation and exchange

Key lessons and takeaways

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Any Questions?

Instead of straw burning, how do you think Lao PDR can better manage crop residue?

A. Use as fertilizer

B. Use as fodder

C. Use as base stock for mushroom production

D. Use as material for biogas production

E. Use as industrial materials

F. Any other uses?

THANK YOU

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