Straw Management in Nepal

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Introduction

- Nepal produces 22 million tons of agricultural residue annually.[1]
- Just three crops, namely rice, wheat and maize, in fact provide more than three-fourths of the total residue produced.
- Of the three, the largest amount comes from rice (47 percent), followed by maize (25 percent).[2]
- A large amount of residue, particularly rice, maize, wheat and sugarcane, still continues to be burnt on the open field in absence of alternate utilization.[2]
- In Rupandehi and Kapilvastu districts, farmers burn rice straw in nearly half of the villages, particularly villages located in the southern parts of the districts.[2]

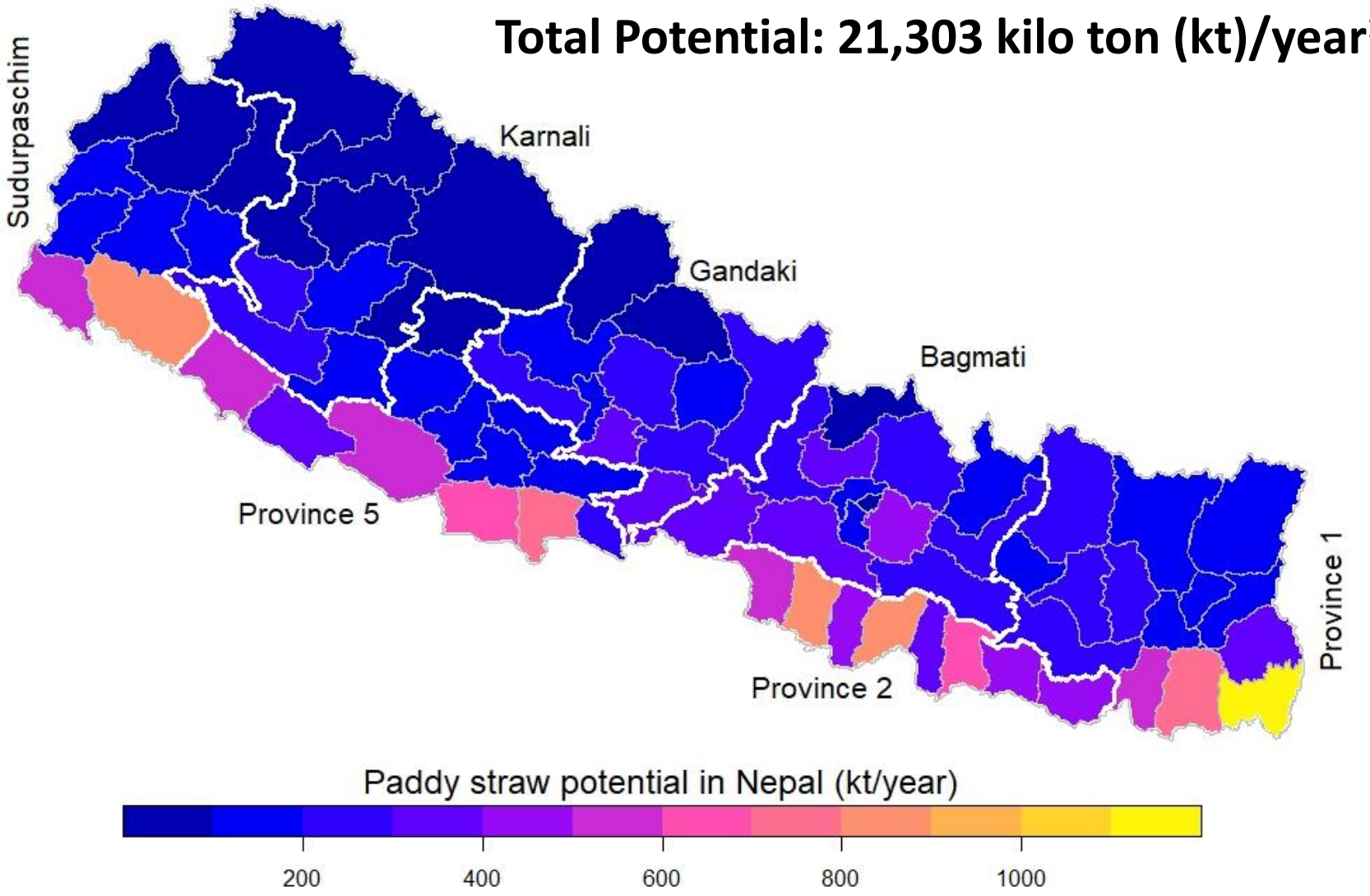
Distribution of Crop Residue Demand

- Southern part of the country has surplus CR.
- The research carried out by CIMMYT-IFAD in 2013 indicates that majority of CR goes to the livestock feed and considerable dry fodder (CR) shortage exists in hills (particularly in dry periods).[3]
- Study conducted in three districts (hill) of western Nepal reviled that villages in low-yielding areas face considerable shortages of dry fodder in the rainy season while even during winter, these villages feel restricted in their dry fodder supply.[4]

It shows the need of integrated approach for CR management

Paddy Straw Potential in Nepal (2016/17)

Total Potential: 21,303 kilo ton (kt)/year[1]



Reasons for Crop Residue Burning

- The straw burning has increased with the use of the combine harvesters[2] (more than 560 CH are operational in Nepal)[3].
- The large farm size and the small number of livestocks are the main reasons for the surplus production of rice straw leads to burning.[2]
- Alternate use of straw is not widely practiced.
- The market for rice straw as animal feed is limited and mainly relied on manually harvested straw.
- Labor intensive process for collecting crop residue.
- Convenience with regard to land ploughing and work relating to land preparation for the following season.[2]
- Farmers' belief that soil fertility is increased by burning of straw.

Integrated Approach for CR Management

- **In-situ Management**: Incorporation and/or mulching of straw improve the quality and moisture retention in the soil.
- Conservation Agriculture
  - Zero Till Seed Drill – is a perfect machine for partial residue retention.[4]
  - Significant yield advantage and cost saving have been reported from the ZT-wheat while significant cost saving from DSR has been documented.[3]
  - CIMMYT is promoting ZT seed drills and provided services to more than 565 farmers for ZT wheat and DSR (2017) in West, Mid-west and far west terai districts.[3]
  - NARC is promoting ZT in mid-southern districts.

Integrated Approach for CR Management

- **Ex-situ Management**:
  - Making nutrient rich Straw Blocks for feed.
  - Mushroom production.

Constrains for CR Management

- Adoption of ZT is hindered by easy availability of rotavators and other traditional tillage options.[3]
- Policy enforce straw collecting machines are mandatory after using the CH; but not strictly followed.

Opportunities for CR Management

- Labour shortage in plantation season in succeeding crop create demand of ZT, Happy and/or Eco seeder
- Shortage of livestock feed in dry season create demand of compressed straw blocks.
- Increase in mushroom consumption create demand of straw.

Recommendation and Conclusions

- Performance-based payment mechanisms can be quite effective in creating incentives to reduce environmental externalities, particularly in the context of crop residue burning.[2]
- Pilot projects/demonstration site for CR management to create awareness in ISM.
- Awareness creation from Government/Agricultural Knowledge Centers in farmers' community level.
- Integrated approach to manage CR:
  - in-situ management – by agricultural mechanization (ZT, Happy Seeder, Eco seeder)
  - ex-situ management – by making feed blocks, mushroom farming, compost fertilizer, industrial products (boards, paper, insulating materials etc.)
  - management by providing subsidy/buying the CR

References

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