Forage utilisation in smallholder systems – African and S.E. Asian perspectives

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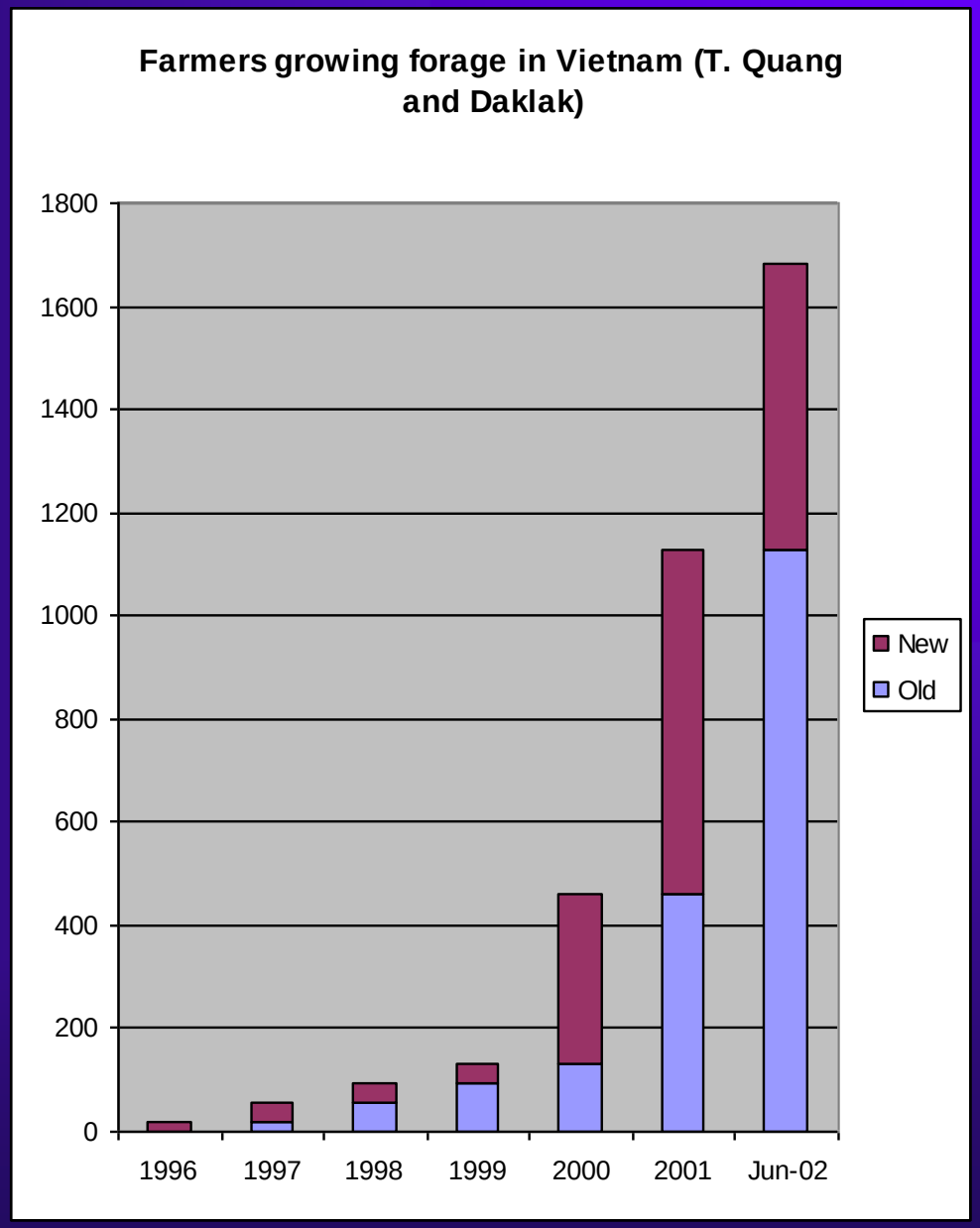
In this presentation:

- Some numbers and facts.
- How are forages used in smallholder systems in Africa and Asia?
- Empirical evidence of benefits from forages.
- What are the smallholder challenges?
- What are our R4D challenges?

Some facts

- Adoption rates of forages in smallholder systems in 6 countries in SE Asia increased from 800 to more than 4,700 within 3 years of the Forages for Smallholders Project.
- Adopted forage species and varieties differed greatly from place to place.
  - E.g. *Paspalum atratum* in Indonesia, *Stylosanthes guianensis* in Hainan (China), *Brachiaria brizantha* in Lao PDR


Farmers growing forage in Vietnam (T. Quang and Daklak)
1800
1600
1400
1200
1000
800
600
400
200
0
1996
1997
1998
1999
2000
2001
Jun-02
New
Old

- 20 tonnes of dual purpose cowpea seeds, 5 tonnes of dual purpose sorghum, and 2 tonnes of dual purpose groundnut seeds have been distributed in the second operational season of the DFID fodder innovation project in Nigeria.

- Within one year of nursery tree R&D activities, the number of farmers growing calliandra in Central Kenya increased from 220 to 2600. In 2003, 26,000 farmers had planted calliandra for feed.

How are forages used in smallholder systems in Africa and Asia?

Some contrasting smallholder forage systems in Africa

Intensive smallholder dairy systems in central Kenya

- Integrated crop-livestock-agroforestry system
- High diversity of food and cash crops
- Favourable climate and environment
- Average farm size about 1.5 ha, 1 dairy cow
- Napier and maize stover based feeding system, purchased dairy meal
- Integration of calliandra or desmodium, use of indigenous trees and shrubs.
- Substituting dairy meal with calliandra increases household income by US$120 per year.

- Smallholder challenges:
  - Milk marketing
  - Longevity and productivity of napier plots
  - Quality and quantity of dry season feed

Barley livestock system in the highlands of Ethiopia

- Barley is the main crop, barley straw a major basal feed for cattle, sheep and equines.
- Every other year fallow (one year), while fallow land is accessible to the whole community for grazing.
- Altitude above 2800 masl, limited options for crops and trees, denuded landscape.
- Milk and butter for home consumption, limited markets.
- Major role of livestock: ploughing.
- Forages grown: oats-vetch mixtures. Potential for tree lucerne.

- Smallholder challenges
  - Sustainable supply of forage seeds
  - Collective action to improve livestock production from fallow land.
  - Access to improved dairy breeds.

Food-feed crop systems in West Africa

- Sedentary farmers in the Sahel, one short rainy season.
- Bulls are kept by men for ploughing and fattening.
- Women keep small ruminants for ceremonies and for sale.
- Intercropping of cereals (sorghum, maize, millet) and legumes (cowpea, groundnut).
- High market value of crop residues: groundnut haulm > cowpea haulm > cereal straw
- New technology of early maturing cowpea followed by dual purpose long maturing variety during the same season has resulted in cash and food availability during the traditional ‘hunger gap’.

- Farmer challenges
  - Timely availability of inputs such as seeds, fertiliser and chemicals.
  - Access to information on diversity and details of fodder options.
  - Market access of fodder products and livestock
  - Food first, forage second.

Some contrasting smallholder forage systems in Southeast Asia

Combined soil and water conservation - cattle systems in the Philippines

- Extremely hilly landscape, low to medium altitude.
- Smallholder maize and coconut system with few beef cattle grazing on degraded *Imperata cylindrica* fields.
- *Setaria sphacelata* has made a major impact to stop erosion and save farmers' time for herding or looking for feeds.
- Net yearly income from livestock increased from $54 to $ 157 after two years.

- Farmers' challenges:
  - Market opportunities, price fluctuations

Fish farming in Northern Vietnam

- Mixed lowland rice and fish ponds; and upland agroforestry, food crops, buffaloes.
- Lack of land, average farm size 1.3 ha.
- Adequate rainfall but low growth rates and feed shortage during cold winter.
- *Panicum maximum* T58 the most adapted and preferred forage.
- Major impact on labour saving for women and children.
- Yearly household income from ruminant-fish systems increased from $99 to $199.

- Farmers' challenge:
  - Finding new farm niches to integrate or rotate forages.
  - Productivity of tropical grasses in cold season.
  - Seed availability.

Grazing under coconuts in Kalimantan, Indonesia

- Main income from coconuts and beef.
- Use of local breed – Bali cattle.
- Traditional system: grazing on *Imperata cylindrica* fields.
- Innovation: fenced plantations, planted with *Brachiaria humidicola* for grazing.
- Increase in income from livestock per capita US$ 60 per year.

- Farmers' challenges:
  - Investments in pasture establishment and fencing.

Summary of smallholder challenges related to forage systems

- *Market opportunities*, and smallholders' access (infrastucture, information) are a major factor influencing the profitability of forage-livestock systems.
- Forages help to overcome household *labour shortages*, which can result in higher intensification or bigger scale of livestock enterprises.
- In Africa more than in SE Asia, *seed production and distribution* is a constraint to wider adoption of fodder innovations.
- *Information systems* are less developed in Africa than in SE Asia.
- Forages need to have a positive impact on the whole *crop-livestock system*; livestock feed mostly of secondary importance.

Challenges for R&D in forages

- Better appreciation of the ***nature of the demand*** of forage species and varieties in relation to crop-livestock system, farm niches, and gender roles.
- Develop strategies to empower communities to understand and exploit ***market opportunities***.
- Place research on forages in an innovation systems context. Which are the main actors related to a certain problem, ***e.g. seed production and distribution***, and how can we facilitate the strengthening of essential linkages to increase the impact of innovations. Increased role of ***private sector.***