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## Alleviating Poverty and Managing Natural Resources through Integrated Crop-Livestock Systems Research in Western China

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**Presenter Information**

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## **Alleviating poverty and managing natural resources through integrated crop-livestock systems research in western China**

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**Key words** : forage agronomy, livestock nutrition, resource-use efficiency, household livelihoods

**Introduction** Traditional subsistence farming systems on the Loess Plateau of Gansu Province have resulted in widespread resource degradation and endemic poverty (Nolan et al., 2008). The Chinese government has responded to these challenges with the "Grain for Green" policy that encourages farmers to replace sloping cropping land with perennial forages (Wang et al., 2007). Local government authorities in eastern Gansu (Qingyang City) have developed a series of rural development programs that build on the "Grain for Green" policy and that are designed to alleviate poverty and improve management of natural resources. One such development program is the subsidised planting of lucerne (*Medicago sativa*) on sloping and non-arable land to increase forage production for pen-feeding to sheep and goats under a cut and carry system.

A new Australia-China research project has been developed to support this local rural development program with the overall aim of enhancing outcomes for local farmers and improving the management of natural resources at the farm-scale. The focus of the research project is to improve the nutrition and production of sheep and goats through utilisation of available feed resources; lucerne forage, wheat straw, maize silage, and other feed options. Project methodology will integrate farmer surveys, on-farm monitoring, field experimentation, bio-physical simulation modelling and whole-farm economic analysis. The alignment of project research with government programs will be strengthened through a formal analysis of policy and institutional settings.

**Materials & methods** Specific research activities will include:

- Monitoring the production and forage quality of feed resources at the farm scale.
- Monitoring sheep and goat liveweight change under a pen-fed, cut and carry production system.
- Design and evaluation of livestock feed year plans that incorporate available feed resources at the farm-scale.
- Analysing resource-use efficiency; land, labour, water, nutrients; at the farm-scale.
- Analysing whole-farm profitability associated with the transition from traditional practice to a farming system focussed more on livestock production (Kemp et al., 2008).

Ultimately, this research is about analysing the trade-offs associated with alternative allocation of farm resources. The challenge is to understand and manage the tradeoffs so that the welfare of local farmers, and the ecosystems that they depend on, are improved (Karieva, et al., 2007).

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