

## 5.4. Framework for assessing the potential contributions of scientific and local knowledge to soil fertility management

### Objective

?? Examine the opportunities for farmers and scientists to assess and manage agronomic uncertainty in risky hillside situations

### Results

Farmers' local knowledge is both competent and flexible to manage spatial variation. One weakness, which could be reduced by a combination with science, is the inability of farmers to change management practices quickly. Under conditions of rapid, often unprecedented, change, such as climate changes or price fluctuations, farmers need to build decision models that explicitly and consistently account for soil processes in order to improve resource use efficiency.

Reliance solely on empirical observations is not enough to cope with rapid change. In order to enable efficient soil management, prevailing agronomic uncertainties have to be identified. Then the analyses of existing local knowledge can help scientists to provide relevant information in order to link observations to processes for the development of useful management indicators for hillside farmers. Indicators need to be precise, but pragmatic, to account for the tendency of farmers to use classification systems that are utilitarian rather than taxonomic and analytical.

Rowe's (1994)<sup>1</sup> uncertainty scheme, in conjunction with an analysis of cropping strategies using Cohen's (1985)<sup>2</sup> classification, can be used as a framework to explore the potential opportunities for the contribution of local and scientific knowledge to a certain agronomic management problem.

### Output

Enabling improved management of agro-ecosystems in hillside environments through relevant and specific scientific and local knowledge.

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<sup>1</sup> Rowe, W.D. 1994. Understanding uncertainty. Risk Anal 14:743-750.

<sup>2</sup> Cohen, P.R. 1985. Heuristic reasoning about uncertainty: An artificial intelligence approach. Pitman, London, GB.

