

**Shaping co-innovation for more effective farmer engagement by farming systems scientists: an illustration from Latin America.**

Rossing, W.A.H.<sup>1</sup>, Dogliotti, S.<sup>2</sup>, Douthwaite, B.<sup>3</sup>, Amendola, R.D.<sup>4</sup>, Cittadini, E.D.<sup>5</sup>, Contini, C.<sup>6</sup>, Marescal Aguayo, V.<sup>4</sup>, Moudry, J.<sup>7</sup>, Omodei-Zorini, L.<sup>6</sup>, Pacini, G.C.<sup>6</sup>

<sup>1</sup> Wageningen University, the Netherlands

<sup>2</sup> University of the Republic, Uruguay

<sup>3</sup> CIAT, Colombia

<sup>4</sup> Autonomous University of Chapingo, Mexico

<sup>5</sup> INTA, Chubut Experimental Station, Argentina

<sup>6</sup> University of Florence, Italy

<sup>7</sup> University of South Bohemia, Czech Republic

Smallholders in emerging economies such as those in Latin America who are producing for markets are easily caught in a vicious cycle of unsustainability. Decreasing prices of agricultural products and rising prices of inputs caused a major decline in family income over the past two decades. The typical response of farmers has been to increase the intensity of production by increasing input application and share of cash crops, and by taking up farming on marginal parts of their properties. This intensification required substantial inputs of labour and capital and often resulted in resource base degradation which in turn negatively impacted on productivity. A major cause of this downward spiral, we argue is that the adaptation of farmers to changing conditions is mostly incremental, short-term oriented and only rarely involves strategic re-design of their rural livelihood strategies as a whole. As a result, livelihoods become locked-in on unsustainable development tracks.

Alternative developmental tracks are possible where socio-economic improvements are combined with improved natural resource use. Systems thinking provides the means to explore consequences of changes in systems management to reveal conflicts between alternatives and to provide directions for promising alternative development tracks. To date, only few positive experiences have been reported where systems approaches have directly supported farmer decision processes, and most of these concern tactical rather than strategic issues.

Economically and agro-ecologically diversified livelihood options do not come as validated technology packages waiting to be adopted by farmers. Here, researchers can play a role in supporting the strengthening of resource users' own learning capabilities. Researchers themselves learn by being able to analyze the many experiments that farm practices represent. This collective learning process, we argue needs to be embedded in project design, and monitoring and evaluation tools should be mobilized and developed to allow continuous adjustments in project activities.

In this presentation we will describe the approach developed in the European-Latin American Co-innovation of Agricultural Systems (EULACIAS) project in which quantitative systems approaches, learning facilitation and continuous project monitoring are constituents of what is denoted as co-innovation. The approach will be illustrated with applications from case studies in three different farming systems in Argentina, Mexico and Uruguay.