**Scaling up agroecological practices in the ‘mixed grains’ action site in Estelí and Condega, Nicaragua**

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***Overview of project***

Although the scaling up of agroecology in Nicaragua has the support of the government (through 2011’s Law 765, concerning organic and agroecological production), of civil society organizations (through eg MAONIC, the national umbrella association of agroecological producers), and of many farmers (through 34 years of the Programa Campesino a Campesino’s outreach), the adoption of agroecological practices amongst farmers is stagnating. Through a case study of an innovation platform (IP) working with smallholders in Estelí and Condega, IP actors and farmers identified constraints and opportunities to scaling up agroecological practices.

***Overview of methodology***

The study included qualitative and quantitative methods of data gathering and analysis. Qualitative data was gathered during semi-structured interviews with actors engaged in the ‘basic grains & ranching’ IP and the broader Nicaraguan agroecological innovation system; two workshops (one with (non)agroecological smallholder farmers; one with IP actors) based in Rapid Appraisal of Agricultural Innovation Systems methodology (Schut et al. 2015); personal observations from workshops, meetings, and field visits; informal conversations with local inhabitants and IP actors; and a review of scientific and grey literature.

Information from the workshops and interviews was triangulated with data from scientific literature; reports from different branches of the Nicaraguan government; reports from national and international NGOs; articles from newspapers in Estelí and Nicaragua; official statistics from the Nicaraguan government; and reports from regional and international research institutions.

Quantitative data was gathered using an amended Values, Beliefs, and Norms survey (VBN; (Stern 2000)) of 120 (non)agroecological farmers. Respondents rated answers on a five-point Likert scale, with 1 being the lowest and 5 the highest rating. VBN provides variables to study farmers’ individual moral motivations to use agroecological practices. The VBN survey was adapted to include an environmental concerns scale (Schultz 2000); additionally, it was complemented by variables based on more pragmatic drivers concerning individuals’ perceptions of self-efficacy and their impressions of the benefits of using agroecological practices (Slovic 1987; Price and Leviston 2014). Farmers were identified and asked to participate in the survey, as well as in the workshop, through the local producer organizations active around Estelí and Condega. Each organization was asked to identify two of their areas, one with a high adoption rate of agroecological practices, and one with a low adoption rate. Within these identified areas, the respondents were approached through snowball sampling. The study wanted to capture the perspectives of both sexes and a wide range in age; the snowball sampling thus also had a focus on approaching male, female and youth respondents. Prior to rolling out the survey, semi-structured interviews on farm management methods and practices used, and problems faced were held with nine farmers in the villages of St. Geronimo and Jocote, both in the municipality of Condega, to gather contextual information to hone the survey questions.

***Project activities and participants***

*Workshops*

The workshop with farmers was held on Oct. 10, 2014, at Casa ASDENIC (the office of the civil society organization ASDENIC) in Estelí. Nine farmers from six organizations (3 women, 6 men) participated in the workshop (see Table 2). During the workshop, farmers described the current farming systems in their area, and exchanged views on how more agroecological farming systems would look, through rich pictures; discussed their perceptions of barriers to and opportunities arising from the adoption of agroecological practices; worked as a group to rank the five main barriers and opportunities; and identified entry points and action plans to surmount the five main barriers ascertained.

The workshop with IP actors was held on Oct. 14, 2014, at Casa ASDENIC in Estelí. Nine representatives from seven organizations (1 woman, 8 men) participated in the workshop (see Table 2). During the workshop, a first discussion elicited ideas on what ‘agroecology’ entails; rich pictures of practices used in agroecological systems were constructed and discussed; strengths and weaknesses of the agroecological innovation system were detailed from the perspective of each organization. The participants then brainstormed on barriers to the scaling up of agroecology, determined the five main barriers, and identified entry points to address these barriers.

| Table 2: Study participants | | | | |
| --- | --- | --- | --- | --- |
| Organization | Farmer workshop | IP actor workshop | Survey | Key stakeholder interview |
| UNAG | x | x | x | x |
| Foro Miraflor | x | x | x | x |
| ASDENIC | x | x | x | x |
| OCTUPAN | x |  | x | x |
| FEM |  | x | x |  |
| MAONIC |  |  |  | x |
| FAREM Estelí |  | x |  | x |
| UNI |  | x |  | x |
| IICA |  |  |  | x |
| CIAT |  | x |  |  |
| INTA |  |  |  | x |
| Banco Produzcamos Estelí |  |  |  | x |
| Private consultant |  |  |  | x |
| FAO |  |  |  | x |
| Total participants | 9 (3f, 6m) | 9 (1f, 8m) | 120 (xf, xm) | 13 (2f, 11m) |

Green: producer organization; Purple: civil society organization; Blue: university; Black: research institute; Brown: financial institute; Red: international non-governmental organization.

*Survey*

120 farmers (x women and x men), who are members of five producer organizations, participated in the survey (see Table 2), which was implemented in September 2014. The distribution of participants’ ages, and gender according to age, is shown in Chart 1.



**Chart 1.** The age distribution, and the gender distribution according age.

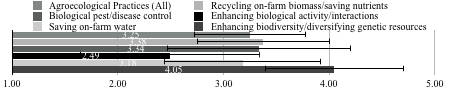
*Key stakeholder interviews*

Semi-structured interviews were held with 13 key informants from 12 institutes (see Table 2). The interview questions were based on PROMIS methodology (Wigboldus et al, forthcoming). The goal was to understand different stakeholders’ motivations for supporting agroecological agriculture; changes in institutional practices concerning the transition towards agroecological agriculture; what practices exactly were scaling; difficulties of the transition to agroecological agriculture faced by and between different system institutions and levels; what strategies their institution used in the scaling up of agroecology; how the scaling process occurred/happened; and what (if any) unexpected side effects occurred due to the scaling up of agroecology.

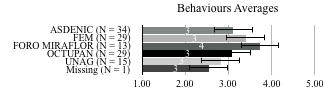
***Project results***

*Agroecological practices used by farmers in the ‘mixed grains’ territory*

Table x shows the average frequency of use of agroecological practices by survey respondents. Agroecological practices are clustered based on scientific principles of agroecology (Altieri and Nicholls 2012). The cluster of practices around enhancing biodiversity is practiced more frequently than the other clusters; the cluster related to enhancing biological activity and interactions has the lowest frequency. The three remaining clusters on biological pest and disease control, saving on-farm water, and recycling on-farm biomass/saving nutrients, all fell between ‘sometimes (3)’ and ‘a lot (4)’ in terms of frequency practiced. Agroecological practices as a whole also rated between ‘sometimes (3)’ and ‘a lot (4)’ in terms of frequency practiced, indicating a relatively high rate of practicing agroecological practices within the sample group, based on this specific list of practices.



**Chart 4.** The average frequency of which all the agroecological practices are being practiced, and also the frequencies of the clusters identified in Table 2. The frequency is based on the 5-point Likert Scale, where 1 is Never and 5 is Always, when asked if they practiced the practices defined in the same table.



**Chart 5.** The average frequency of which all the agroecological practices are being practiced, based per producer organisation. The frequency is based on the 5-point Likert Scale, where 1 is Never and 5 is Always, when asked if they practiced the practices defined in the same table.

Breaking down the list of agroecological practices differently, Chart 5 depicts the frequency of the agroecological practices, a long the lines of which producer organisation the respondent is affiliated with. It is unsurprising considering the strict set of rules that the respondents affiliated with FORO Miraflor come out the strongest with regards to agroecological practices. As FEM was also mainly promoting agroecological practices, it suits that it should be second on the ‘ranking’, while the remaining three producer organisations, ASDENIC, OCTUPAN and UNAG, also work with more conventional agricultural practices, which could explain their lower ‘ranking’.

The data also showed strong interlinkages between the scales on perception of risk, uncertainty and benefits. The uncertainty and risk perception scales correlated significantly and positively with each other (.61\*\*). The uncertainty (-.25\*\*) and risk (-.22\*) perception both correlated significantly and negatively with the benefit perceptions. This meant that when the uncertainty perception decreased, so did the risk perception and vice versa. As both the uncertainty and risk perception decreased, the benefit perception increased.

There are thus some strong linkages between the variables, yet the two strongest predictors of practicing agroecological behaviour are the behavioural control expectancy scale and the personal norms scale. This means that according to this data the sense of obligation and the perception on self-efficacy are the two main drivers behind adoption of agroecological production methods.

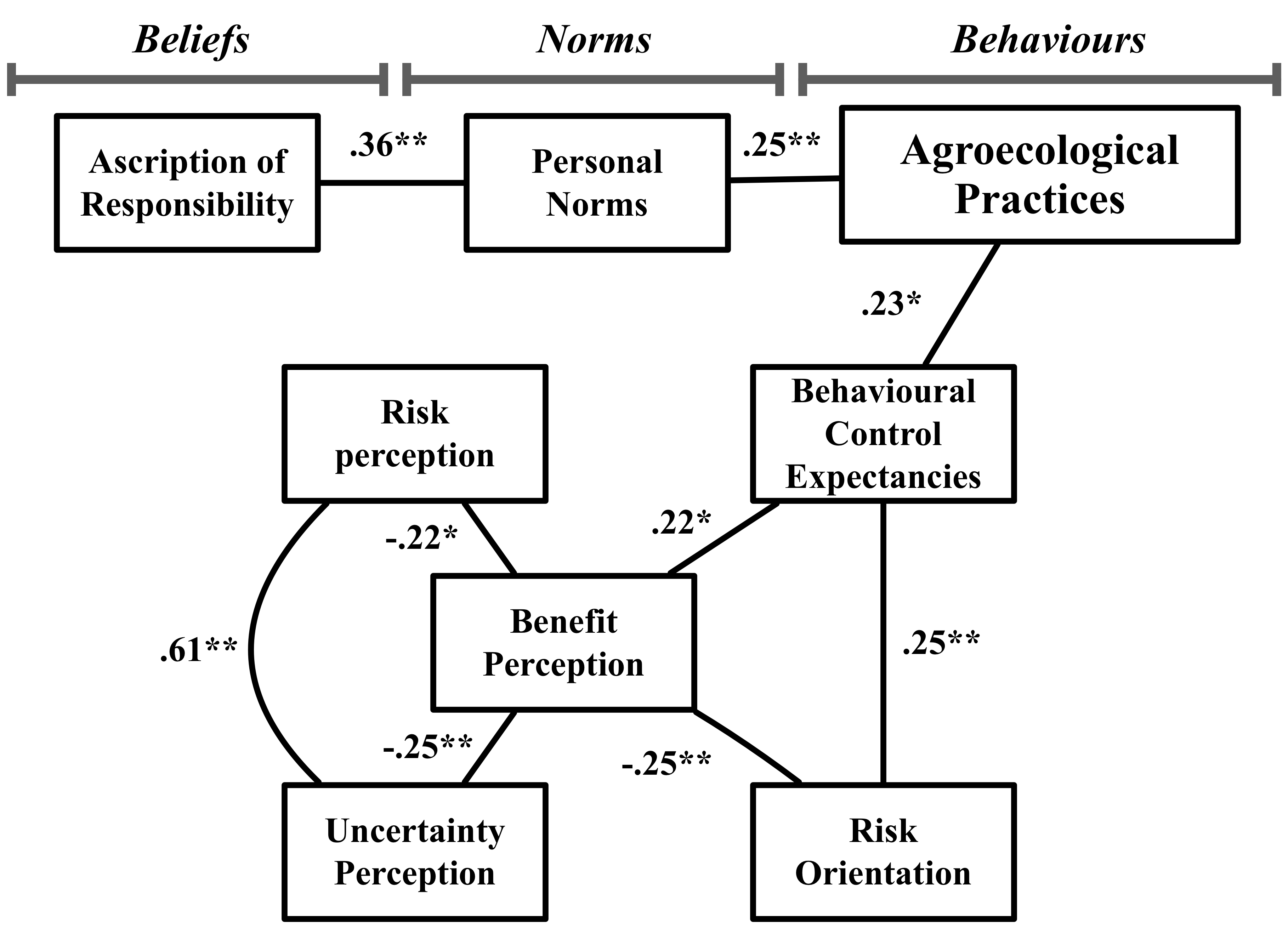
*Barriers to the scaling up of agroecological production*

* “islands of agroecology” in national AIS = nonalignment of agroecological work
* no differentiation between conventional and agroecological products in local and national markets = no price premium for agroecological products
* little consumer awareness of benefits of agroecological products
* rapid change of government officials dealing with agroecology
* no specific loans or financial products for parameters of agroecological production
* lacking sufficient production of and timely access to bio-inputs (seeds, fertilizers, pest and disease management products)
* fragmentation of smallholders’ land parcels = more difficult implementation of holistic agroecological practices
* chemical runoff from neighboring conventional farmers’ fields
* needs of farmers are communicated to research institutes, but results of research not disseminated back to farmers

*Strategies to promote agroecological production in the ‘mixed grains’ territory*

The diversity in application of agroecological production methods either highlights that the farmers are in transition towards applying agroecology holistically, or that they have applied as many of these methods as they plan on doing. The data also shows that when a farmer is working with an organisation that is also promoting conventional agriculture, the use of agroecological production methods is lower on average. This could be explained by the confusing message the organisation brings across to farmers, as it can already be confusing for the organisations themselves (ref - interview representative ASDENIC). This is where links start to appear to the innovation systems analysis of the push to scale up agroecology in Nicaragua (see Schiller et al., forthcoming).

* Diversification of producer cooperatives’ one-crop focus
* Liaising between IP and the Estelí branch of Banco Produzcamos to identify opportunities for financial products specific to parameters of agroecological production (eg loan programs for diversified systems, not just single-crop based loans)
* Liaising with large ranchers for manure for small producers to use as fertilizer
* Stronger interactions between producer organizations and local research institutes concerning the sufficient and timely production of clean native seeds, especially for mixed grains
* Linking to psycho-behavioral aspects influencing farmers’ decisions to (not) adopt agroecological methods: various aspects of the norm-activation theory, as well as the locus of control aspect of BCE, explain the adoption of agroecological production methods. Farmers’ sense of obligation to change, and the perception of one’s own ability to change, are the biggest drivers of adoption (see Figure 2). This underscores the central importance of supporting farmers in capacity development, co-learning, and co-innovation processes.



**Figure 2.** Final correlations and linkages that link to the agroecological practices.

*Incentive mechanisms to support agroecological production*

* Financial support from Government for farmers during the transition period, when yields are low
* Specification of agroecological products in the marketplace through a national public certification system (in progress)
* LINK analysis (Lundy et al 20xx) of the national value chain for agroecological products, with the goal of linking actors, from producers to consumers, to support the integration of agroecological products into the national food market.
* Public awareness campaign to raise consumers’ knowledge of the benefits of agroecological production, and the importance of buying agroecological products
* National agroecological extension program; support of agroecological capacity-building for farmers (smallholders and large farmers)
* Clear national policies concerning agriculture
* More government financing of research into production of clean native seeds by national agricultural research institutes
* Implementation of NTON standards for agroecological production, with a view on differentiating agroecological produce in the marketplace to generate a price premium

***Other project-related activities***

Results from this study were presented at two conferences in 2015. During the Second International Conference on Global Food Security, held in Ithaca, NY, USA from Oct. 11-14, 2015, a poster presentation on “Scaling up agroecology in Nicaragua: Linking systemic and individual determinants” was given. At the Conference on Tropical and Subtropical Agricultural and Natural Resource Management (Tropentag), held in Berlin, Germany from Sept. 15-18, 2015, an oral presentation on “Innovation platforms at work: Supporting the transition to agroecological farming in Nicaragua” was held. A short paper expounding on the presentation has been published in the *Proceedings of the 2015 Tropentag* and is available online ([www.tropentag.de/2015/abstracts/full/536.pdf](http://www.tropentag.de/2015/abstracts/full/536.pdf)).

Three academic papers are currently being written based on results of this study, exploring different aspects of the scaling up of agroecology. All will be submitted to peer-reviewed journals by March 2016.

***Next steps***

In early 2016, results from this study will be reflected upon by study participants in a workshop to be held in Estelí. Further, similar studies will be implemented in Matagalpa in the ‘coffee’ territory, and in Waslala in the ‘cocoa’ territory, between April and September 2016. Results from all three studies will be explored for similarities and differences, and feed into two further academic papers, to be written in late 2016/early 2017.

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