Organic Agriculture Programs
Calca, Peru

Research Deliverable
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Executive Summary

In August of 2014 the Andean Alliance for Sustainable Development (AASD) commissioned this report in order to obtain more information about the opinions of the people they work with every day - farmers in the rural province of Calca in Peru.

Calca is no stranger to agricultural programs, and is also no stranger to those that have failed. Originally, the focus of this research was going to be an evaluation of one specific agricultural program, La Sistema de Garantía Participativa (SGP), an organic certification initiative promoted by IFOAM\(^1\), which took place in Calca in 2013, that had encountered sustainability issues. However, upon arriving in Calca it became clear to both AASD and the research team that a larger focus was needed. SGP was not the only agricultural program to encounter difficulties in implementation and sustainability. ANPE\(^2\) and AGROECO\(^3\) were also formed to assist and educate farmers both ecologically and economically. These organizations teach farmers best practices for crop biodiversity, assist with access to organic markets, as well as design and contribute to public policies to promote laws and support for small-scale agriculture production. These NGOs also partner with local Peruvian grassroots organizations to ensure farmer protections and education. Arariwa\(^4\) is an NGO also created to help rural farmers in Peru and, similarly to ANPE and ACROECO, promote sustainable agriculture. In addition to educational training, they offered micro financing options to farmers. The research was refocused and the scope widened to look at farmer’s perceptions and opinions of organic foods and farming methods, in the hopes that this may give some indication as to what enables or disables effective agricultural programs.

This document presents the research team’s findings after an exhaustive analysis of the data gathered in the field. Our analysis shows interesting correlations between people’s opinions and the following agricultural programs: ANPE and ARARIWA, but perhaps the most interesting result from our analysis was what we failed to find - a connection between farmer opinions and organic practices. This has important policy implications for those looking to bring

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1. The International Organization of Organic Agricultural Movements founded in 1972, “the worldwide umbrella organization for the organic agriculture movement, which represents close to 800 affiliates in 117 countries. Headquartered in Bonn, Germany. IFOAM maintains an organic certification service known as Sistema de Garantía Participativa in Spanish and Participatory Guarantee Systems (SGP) in English.

2. Asociación Nacional de Productores Ecológicos del Peru (National Association of Ecological Producers of Peru) With 20 national offices, ANPE works with 12,000 farmers throughout Peru.

3. AGROECO began as an initiative at Universidad Nacional Agraria La Molina in Lima, Peru.

4. Arariwa, a non-profit organization founded in 1984 worked within the Cusco region to ‘increase the rights and capacities of the local population, improving their livelihoods while strengthening their cultural identity and fortifying democratic institutions in search of sustainable development.’ Interviewees’ responses indicate that Arariwa is not currently operating in the Cusco region.
about lasting behavioral changes at the grassroots level. Based on all of these findings we will present policy recommendations for achieving sustainable changes in farming practices in the Calca region.

**Policy Context**

**Organic Agriculture in Peru**

The Peruvian government has been setting the foundation for a movement towards sustainable organic agriculture for several years. The creation of new laws, governing bodies dedicated to overseeing the sector, as well as state mandated financial incentives contribute to the development of this sector. The long-term objectives of the Peruvian government include the percentage of beneficiaries of these projects that move above the poverty line, the efficiency and effectiveness of government investment and the level of capacity of users (Salazar, 2014).

In January of 2008, the Congress of Peru passed the Law for the Promotion of Organic and Natural Production restructuring the objectives of the Ministry of Agriculture to promote organics (Ley N°29196). Article 2 of this law specifically details four objectives: 1) Foster and promote organic agriculture in order to contribute to overcoming poverty, food security and the conservation of ecosystems and biological diversity. 2) Develop and foster organic production as an alternative for the country’s social and economic development, so as to improve the quality of life of producers and consumers and to help overcome poverty. 3) Determine the duties and competencies of the institutions commissioned with the promotion and oversight of organic agriculture. 4) To strengthen the National System of Oversight and Control of Organic Agriculture in order to guarantee the condition of the organic products in both the domestic and foreign market.

Article 10 of the aforementioned law requires that the Agricultural Bank of Peru (El Agrobanco) grant loans to certified producers during the period of conversion to organics, of their land properties, in accordance with established requirements. This bank was created in 2001 through Law N°27603 and is the principal instrument of financial support from the state to sustain and develop the agricultural sector. Article 10 of this law explicitly incentivizes the

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6 The Peruvian Government legally recognizes organic as, “Every product originating in a system of organic agricultural production or a system of sustainable processes that employs technologies that, in harmony with the environment and respecting the cultural integrity, optimize the use of natural and socioeconomic resources, with the objective of guaranteeing sustainable agricultural production ((Ley N°29196).”

7 Ley N° 29196 de Promoción de la Producción Orgánica o Ecológica (Law N° 29196 of the Promotion of Organic or Ecological Agriculture). Retrieved from [http://servindi.org/pdf/Ley29196.pdf](http://servindi.org/pdf/Ley29196.pdf)
prioritization of organic production by regional and local governments. Medium-scale and small-scale producers are prioritized, especially in rural regions experiencing extreme poverty (Zarzar, 2014).

Additional government efforts that have been created to support the agricultural sector include the formation of The National Council for Organic Products (CONAPO). CONAPO was created in December of 2013 to strengthen small-scale organic farming by creating partnerships across development sectors and regions. Also, Obras Por Impuestos, a law designed to assist development and infrastructure, allows companies to contribute up to half of its income tax to infrastructure projects in areas where they have operations; this has helped improve roads, boost business, and pump money back into the communities (Ella Brief, 2014). The Peruvian government has gone to great lengths to assist farmers and to promote organic agriculture, but there are still issues to be resolved.

**Participatory Guarantee Systems in Peru**

The current national certifier of organic products in Peru is Bio Latina. However, SGP, an alternative certification body, has been implemented in some regions of Peru over the past decade. Participatory Guarantee Systems, as described by IFOAM, is an organic certification that is both “less costly and administratively complex than other third-party accreditation bodies.” SGP is the replacement of a third party certification program that encourages an integrated and active process among organic agriculture stakeholders. These stakeholders include government, NGOs, and groups of farmers that are integrated into a collaborative network of capacity building and peer review for a two-year program in order to attain organic certificates. While SGP was introduced by ANPE-AGROECO in Calca in 2012, they have been operating in Huánuco since 2005 and are officially recognized as a valid organic guarantee system in that region, SGP has yet to be recognized by the Peruvian national government.

**Participatory Guarantee Systems in Latin America**

Available studies of SGP programs across several continents note positive effects including: increasing the prevalence of seed sharing, collectivized marketing of products for improved market access, lower cost of agricultural inputs and increases in food security and nutrition resulting from crop diversification. Specifically, in Latin American, countries that have had success with SGP have been found to exhibit national endorsement, community participation, and access to markets as tenets to successful SGP initiatives (Kallander, 2008). As of 2011 seven Latin American countries have implemented SGP into their legislation or into a resolution: Bolivia, Brazil, Costa Rica, El Salvador, México, Paraguay and Uruguay.”

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9 Bouagnimbeck, H. 2014. Report commissioned by AGROECO. Published in Germany by IFOAM.
(Hochreiter, 2011). In Mexico, PGS is considered as a legally binding national certification system. Access to a viable market is one contributing factor that could explain the success of PGS in Mexico. In 2004, the Foundation of the Mexican Network of Organic Markets and Tianguis (street markets) opened 20 farmers markets across the country creating the space to link rural producers and urban consumers.

Despite wide implementation over the past 10 years there is very little literature focusing on evaluating the success of PGS as such, with the majority of documentation being evaluated internally by IFOAM or entities citing IFOAM documents (Jordan & John, 2010) (Moschitz, 2011) (Bouagnimbeck, 2014). Negative indicators and difficulties facing program success were rarely indicated in the existing literature, or not mentioned at all (Khosla, 2008).

![Figure 6: Number of operational PGS initiatives in Latin America Source: IFOAM PGS Map (online)](image)

**Policy Analysis**

Several researchers of organic certification programs have questioned the program's effectiveness at carrying out the intended objectives. Other challenges include unclear economic benefits of organic certification especially with regard to SGP. Unlike other certifications like Free Trade, organic certification does not come with a price guarantee (Willer & Kilcher, 2011), and in the case of Peru, SGP certification is not recognized under government organic standards (Moschitz, 2011) (Bouagnimbeck, 2014) (Willer & Kilcher, 2011) meaning price stability can be heavily dependent on demand in the local market.

The Peruvian government has made significant efforts to support farmers and create the conditions necessary for a large-scale transition to organic agriculture. Notwithstanding, there is still a great deal of work to be done for this movement to truly reach its development objectives. In our research, farmers did not indicate awareness of the available funding specifically created by Agrobanco to promote organic agriculture. In 216 surveys and 21 interviews, Agrobanco was never mentioned. Also, since these loans are specifically directed towards producers with organic certifications it is necessary that certification opportunities are accessible to the primary target
group, rural farmers living below the poverty line. Lastly, despite the initiative *Obras por Puestos*, our research found that many farmers struggle with transporting their produce to the market.  

Much improved background for general readers!

**Research Area**

Peru’s Calca Province is one of 13 provinces in the Cuzco region and is located in Andean mountains in the Peruvian Highlands. There are approximately 60,000 people who live in this province and 20,000 inhabitants in the capital city, also named Calca. This ancient part of the country was inhabited by the Inca civilization and many traditions have been passed down generationally, including farming practices, language, and other cultural activities. Historically speaking, the people of Calca have worked in agriculture, which still is the primary source of income today. The majority of the population is subsistence farmers and the main crops that are cultivated specifically to sell are potatoes, corn, and quinoa. Some farmers also own animals for sale and consumption including cattle and guinea pig. People in this region speak Spanish and/or Quechua. Many of those surveyed primarily speak Quechua, which required the use of interpreters during the research process.

**Research Questions**

This research project was designed to investigate the following research questions:

1. What is the general sentiment of organic agriculture in the Calca region of Peru?
2. Does participation in agricultural programs affect the farming practices of a household?
3. Which demographic and lifestyle variables influence a respondent’s opinion of organics?
4. Is there a significant association between the respondent’s opinions of organic agriculture (as measured by the Likert scale) and their farming practices?

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10 In 2014, the Peruvian Government passed law 29230, called “Works for Taxes Law” to accelerate the implementation of priority public infrastructure projects across the county.

11 *The Capital of the Empire INCA (Promo Region Peru; Calca)*
Analysis Methodology

Quantitative Data

The quantitative analysis of our data started with cleaning the data received from our 216 surveys of roughly 40 questions each. Once it was clean the real work began in preparing the data for analysis in R, including structuring the data for analysis. This included identifying which data was categorical in nature and making sure it was factored so the software used for analysis could properly interpret the various categories. Several of the variables used in our analysis had to be created from other data - for example, the survey did not have a place to record the number of fertilizers a respondent used, but did record all the fertilizers they used, so we could then create an extra variable counting the number of fertilizers used from that information. In another case, the ‘EduScale’ variable had a good number of missing pieces. Due to the way in which the survey was conducted it was possible to create a complete dataset for education by combining the ‘EduScale’ and ‘ShopperEduScale’ variables into a new variable with all complete cases. As a note for guidance in the quantitative section, the variable dIncome refers to the price premium organic produce earns over the conventional equivalent, while IncomeForOrganic reflects the person’s overall opinion of the income organic farmers earn compared with their conventional counterparts. Due to time constraints completely redoing all of the charts in the quantitative section was not feasible, but notes have been added below the appropriate charts.

After this we used our research questions to guide analysis by creating a list of hypotheses and associated variables that needed to be tested to address those questions. The exact tests used to address the particular questions are included in the analytical breakdown given in the next section. Due to the structure of our data a large number of the analyses were chi-square tests or t-tests for difference in proportions. In some cases involving the Likert score variables they were used both as categorical variables for chi-square analysis, and as numeric variables in t-tests for difference in means. The details of the tests run are present in the analytical narrative for each of the research questions.

Qualitative Data

The qualitative data includes the final qualitative survey question for 216 respondents. The final survey question asked interviewees, “What are the advantages and disadvantages of organic agriculture?”

The first step in our qualitative analysis was to code the 216 responses. Codes were generated based on emerging patterns and attitudes of the interviewees in reference to organic agriculture. 22 codes that contributed to our analysis are included in the qualitative data.

12 The final survey question in Spanish was: “¿Cuales son las ventajas y desventajas de la agricultura organica en general?”
dictionary, which highlight interviewees’ references to tradition, health, conventional agriculture, production, the environment, and the market. Codes were then analyzed within the context and coded by location, gender, educational background, and previous agricultural program participation by the interviewees.

As you will see in the following analysis, interviewees are hyper aware of the market barriers, production restraints, and overall health benefits of organic products. The final qualitative data code dictionary and a table with corresponding numbers of respondents for each code are included in Appendix 3.

**Data Collection Limitations**

There are various factors that have limited our research methodology process. First, the use of a Likert scale caused confusion for many participants. Participants had trouble interpreting the numbers and shapes and expressing them through general ideas. We simplified the Likert scale as best we could to compensate. Another limitation we encountered was the difference in terminology, specifically related to farming. Many Peruvians used nuanced words that we may have interpreted differently. Sometimes they used words interchangeably for one concept and those words may have meant something different for other people. Similarly, there were misconceptions about the definition of organic and how Peruvians understood organic compared to the American surveyors. For example, many farmers considered their food to be organic if they only used a small amount of chemical fertilizer to start the growing process, but then did not continue use afterwards. We also identified some specific limitations related to the qualitative data. We did not have two strong Spanish speakers in every group so there were issues with group ability to conduct interviews and record surveys simultaneously and accurately. Also, in some cases handwriting was illegible or extremely difficult to comprehend. There were a total of 14 entries that were either completely illegible or partially illegible in either English or Spanish. Misinterpretation by the data entry person could also have contributed to unclear qualitative responses.
Research Question 1: What is the general sentiment of organic agriculture?

The qualitative data has offered a number of interesting findings including survey respondents’ significant awareness of organic agriculture. Only 10 respondents expressed uncertainty about the advantages and disadvantages of organic agriculture and only one interviewee, an outlier, believed, “organic is something with chemicals.” The majority of interviewees associated organic agriculture with health, the market, production, and the environment. The following section shares comments made directly by survey respondents. This section is organized from most common responses to least common, though the less common codes are included as they are pertinent to this analysis.

92 interviewees associated organic agriculture with health benefits. Interviewees’ specified organic advantages by saying that organics are healthier, natural and better for your health. One mother stated, “It’s improved the health of our children and we should promote organic by looking at our children’s future consumption habits.” Interviewees also mentioned organics as contributing to fewer illnesses. Organic is recognized as healthier by respondents, while conventional agriculture is associated with chemical use and poor health. According to respondents, although chemicals help with production, they can be harmful to health.

61 interviewees referred to the market for organic agriculture in both a positive and negative manner. The negative organic market references included the common belief that organic agriculture products are not only more difficult to sell but often sell for much less than non-organic products. One interviewee explicitly stated, “There is no market for organic.” On the
other hand, the positive organic market comments included the belief that organic products can increase farmers income but only if the products are large and done on a greater scale. Interviewees also made positive associations with the market for organic if they sell to hotels and restaurants or export their products abroad. Individuals also expressed a belief that organic sells faster and earns a higher price. 41 of these responses were negative market references and only 20 were positive references, which highlights an overwhelming majority that associate the market for organic agriculture in a negative manner.

In addition, 61 interviewees made both positive and negative references to organic production, with 46 negative references and only 15 positive references to organic production. The most common negative references to organic production were that organic produce does not grow as well as conventional farming and farmers have actually seen a decrease in production. Organic farming also requires a greater time commitment and more intensive manual labor. The level of value that farmers place on organic farming appears to be low and was reflected in the responses. On the contrary, some farmers found that organic agriculture results in a higher variety of crops and is better for the land and interviewees emphasized an increase in quality. If producing high yields is not a top priority of theirs, they stated that organic works well with small crops. It also must be noted that some believe organic to be more cost effective than conventional farming, for example, “it saves money because chemicals are very expensive and it is easier to work, looks better, and lasts longer.”

Intriguingly, 24 interviewees commented on the state of the environment as it pertains to organic agriculture and agriculture in general. Of the 16 interviewees that negatively referenced the environment, 9 were male, 7 were female, and only 4 had previously participated in an agriculture program. Negative references to the environment included that pests attack organic crops at a faster rate than non-organic crops and it can be quite difficult to manage. Another common response was the belief that pesticides are somehow linked to climate change. For example, one participant stated, “We are losing siblings little by little because of climate change. At the global scale we are all siblings and I don’t want to poison people through their food.” There was a general consensus that climate change has brought difficulties to the area. Rainfall has decreased, composting does not work as well as it once did, and nothing can grow without the assistance of pesticides. Of the 8 interviewees that positively referenced the environment for organic agriculture, they stated that organics do not contaminate the land and organic farming is better for the environment.

Only 20 interviewees clearly stated that they personally consume organic products, 14 of which were women. Only 6 of the interviewees that mentioned they consume organic had participated in an organic agriculture program (Sierra Sur, Arariwa, AGROECO, and IEMA). The rationale for personal consumption was that organics are more nutritious and better for long-term health. There was a common theme that parents made it a priority to eat organic with their families and had much concern for the health of their children and the effects chemicals may have on them.
Education had no impact on personal organic consumption, of the 20 who stated that they eat organic products, their education varied from no education to university-level education.

Interestingly, 14 interviewees openly stated that there are no disadvantages associated with organic agriculture and only 2 had ever participated in an organic agriculture program. These respondents had educational backgrounds ranging from no education to university-level education.

5 Interviewees reference the risks associated with growing and selling organic agriculture. For example, some farmers spoke about the lack of reliability with organic farming. This was reflected in the responses that organic farming does not guarantee a large harvest, in comparison to conventional farming, and actually produces a smaller yield. This fear has resulted in the use of pesticides and chemicals as a safety net by a large proportion of farmers. Not only is there feedback that the crop is unreliable, but the price earned for organic products is also very fickle. One respondent stated: “[Organic agriculture] always varies, it’s less reliable and it doesn’t earn the price you wish for.” There is general agreement that organic agriculture is a riskier venture than conventional agriculture.

Interviewees shared confident and definitive statements with interviewers about organic agriculture such as, “people in the city are stupid because they do not know what they are eating.” A former program participant in both Arariwa and IEMA said that she, “grows and eats organic for the family, but the crops are much smaller, and no one wants to buy small produce. There is not enough profit to send kids to school. Can’t provide enough organics, but organics are healthier.” These statements demonstrate frustration and bluntness.

The aforementioned qualitative codes demonstrate interviewee’s awareness of organic agriculture as it pertains to the Calca Region. These findings will contribute to our research findings and weigh heavily in our policy recommendations.
Research Question 2: Does participation in agricultural programs affect the farming practices of a household?

Fertilizer Use and Agricultural Programs

The first part of this question is to address fertilizer use. We began by analyzing this to see if there was any association between fertilizer use and participation in any agricultural program. To do this, we ran t-tests for difference in proportion, which showed absolutely no difference based on agricultural program participation. The proportion of those that use fertilizers is almost exactly the same between the two groups.

Next, people were analyzed on the basis of individual programs to see if any of the programs had a significant effect on farming habits. This analysis revealed no significant differences in fertilizer use based on participation in Arariwa or in ANPE.

Produce Grown and Sold

The next step was to begin analyzing the data for relationships between the various agricultural programs and growing and selling habits. To do this we decided to use a t-test for difference in
proportions with relating Arariwa and ANPE participation to every crop we gathered data on to determine if some programs were associated with growing particular crops. Participants in Arariwa showed no significant differences from non-participants in their growing and selling habits.

ANPE participants at first appeared to grow a much wider array of produce than non-participants in our sample. However, both of the people in our sample who grew 13 different crops are part of the ANPE sample, making it useful to look at how they may influence any of our analyses for ANPE. With regard to the variety of crops participants grow, the following table shows those varieties that ANPE participants grow more often than non-participants if we include the outliers.

However, if we run the chi-squared tests again and exclude the outliers, then ANPE participants only show a statistically significant difference from non-participants for two specific crops, lettuce/lechuga and cabbage/repollo.

ANPE participants also demonstrated a significantly higher average number of crops grown in our next set of analyses. These focused on whether participation in agricultural programs had any effect on the total number of different crops grown. To do this a variable was generated from our data counting the number of different crops that farmers reported growing, and then independent sample t-tests were run using the agricultural programs as our categorical grouping variable for the analysis. In these tests, participation in agricultural programs in general, and Arariwa
participation specifically, did not show a significant relationship with the number of crops a farmer grows or sells on average.

Much like with the previous analysis for variety, ANPE participants showed a propensity for growing a significantly larger number of crops on average compared with those outside the program. However, a large part of this is due to the outliers. The charts below show the difference between the mean number of crops grown by those in ANPE, both including the two people who grew 13 crops and excluding them.

As you can see above, ANPE participants do grow more produce than the average in both cases, though a large part of the difference in means is due to the presence of the high production farmers in our sample. And while a test excluding those two still shows a higher mean for ANPE participants, removing those two outliers removes the statistical significance of the findings.

**Question 2 Summary of Findings**

Our analysis of agricultural programs and farming practices finds very few statistically significant associations between participation in agricultural programs and farming practices.

The only associations found were between participation in ANPE programs and the variety and number of different crops grown, but after removing some heavy outliers from the group and rerunning the analyses the statistical significance of the findings almost entirely disappeared.
Research Question 3: Which demographic and lifestyle variables might influence a respondent’s opinion of organics?

For this question the following hypotheses were generated regarding a number of variables in our dataset:

- Education - Higher levels of education will be associated with more favorable opinions of organics, which will be reflected with higher Likert responses.
- Participation - People in agriculture programs will be associated with higher Likert responses.
- Location of Sales - People dependent on conventional markets will have lower Likert measures, especially for income.
- Land ownership - No hypothesis, exploratory.

General Descriptive Statistics

Before starting with a more complex analysis, it is useful to get a general idea of the opinions of the farmers as measured by our Likert scale questions. The following table is a summary of those findings.

![Mean Score for Likert Measures](image)

*Income refers to the price premium organic produce earns over conventional produce.

It is clear that opinions of the health, taste, and appearance of organics are much more optimistic than those relating to income potential or quantity. (Included in the Appendix is a more detailed table listing the standard deviation for each of these measures (Table A-1). Also, given the very high average and small standard deviation for our measures of Health and Taste, it appears that a high opinion in those areas constitutes somewhat of a baseline for the region, and given that lack of variability, we expect that many tests for association in those areas may not be significant.
In order to analyze education with regard to the respondents Likert scale responses we first considered using a regression analysis, however our Likert scale only has five values, and thus lack the resolution necessary for a regression analysis to be enlightening or valid. Instead, we used the Likert measures of organic opinion as categorical grouping variables for an ANOVA model. By breaking respondents into groups based on their responses to the Likert questions, we hoped to find statistically significant differences between those with high and low opinions of organic agriculture.

However, after running an ANOVA model using all of our Likert variables, only the analysis of Quantity and Education showed any statistical significance and even then it is difficult to interpret. This is the plot of means for the ANOVA model, showing the significant difference between those who answered with a “1” and those who answered with a “3” (“Much Lower” and “No Difference” respectively).

This is difficult to interpret as it is difficult to say what the difference is between the “1” and “3” groups’ means if they are not also different from any of the other groups. Further abstracting our Likert scores into three groups representing negative, neutral and positive opinions left us with no significant differences.

To look into this a little further, we then took our measure of education and all of the Likert scale measurements and did an analysis to see if education may have simply affected the way in which people interacted with the Likert scale, which may give us some insight into these results.

There had been a concern during surveying that those with lower education may not understand the Likert scale as it is not a part of the local culture the way it is in the United States. After running an ANOVA model and pairwise t-tests we did receive a slightly lower mean level of
education for those that answered 3, but with a 95% confidence interval the difference was not statistically significant.

Agricultural Programs

To examine the hypothesis that past participation in agricultural programs may have an influence on a respondent’s opinion of organic agriculture, we analyzed the association between our Likert scale responses and our measurements of program participation.

First, we simply cross-tabulated our variables for participation in programs with our various Likert measures. Using this method of analysis, there was no significant association between program participation and the Likert responses, either in general or more specifically to one of our programs.

After that failed we attempted to use a numeric measure to see if the mean Likert scores of participants in programs differed from non-participants. For this we used one-tailed t-tests to analyze the difference in means between participants and non-participants. Again, our groups did not display any significant differences in opinion based on participation in agricultural programs.

Market Location

In order to determine if there was a connection between a respondent’s opinion of organic agriculture and where they attempted to sell their produce, we employed t-tests for difference in means to determine if the mean Likert score for respondents was different based on selling at various locations versus those that did not sell there.

One of the first associations we found was a connection between low opinion of the appearance of organic produce and selling at a conventional market, like the one in Calca. What we found was that those who sell at market have a significantly lower average opinion of how organics look in comparison with non-organic produce. This is something we expected to find, as people would
commonly state during our qualitative research that chemical agriculture produced better looking produce, which made organic harder to sell.

Taken in that context, it would make sense that those who attempt to sell their organic produce at market and encounter difficulties would have a lower opinion than those who do not encounter the dynamics of a market and consumers that do not prefer a healthier (in the opinion of most of our respondents) but less appealing organic variety.

When we ran the same analyses for those who sell at restaurants, the results were on the one hand unsurprising, and on the other discouraging. Those who sell at restaurants have a statistically significant increase in their mean Likert score for how healthy they believe organic food to be. Unfortunately, it appears that selling to restaurants may not be a panacea for the organic market - those who sell to restaurants are generally even more pessimistic about the earning potential of organic than those who sell elsewhere. It may be that the price premium restaurants are supposed to generate for the farmers does not actually materialize.

However, only 11 respondents sold to restaurants. This leaves open the possibility that these results are a statistical anomaly and the survey randomly sampled the more pessimistic people who sell to restaurants. More research should be done with those selling to restaurants to get a larger sample size, but initial results in this area are not promising.
The same analysis was run for Bioferias, which are markets dedicated to the sale of organic products. This analysis actually showed positive results. Measures of both appearance and income potential of organics were significantly higher for the 27 farmers who had participated in selling at a Bioferia, which suggests that perhaps the Bioferias were more successful for some farmers than our research leading up to the survey implementation had led us to believe. This is assuming that farmers believe that organics can earn a premium due to participation in a Bioferia, and not the reverse, but it is a positive sign that there may be something worth salvaging from the idea of implementing a Bioferia.

These same tests were run for the remaining sales locations in our survey, but no other significant associations could be found.

**Opinions and Ownership of Land**

The following are the results of a Pearson Chi-squared Test for difference in proportions. In this set of tests we attempted to see if respondents’ opinions of organic agriculture differed depending on their relationship to the land they worked. The following two tables document the significant relationships that we found.

Based on these findings we can say that those who work on someone else’s land tend to have a more favorable opinion of the income that organic produce earns than other groups. Meanwhile, communal farms tend to have a lower opinion of the harvest yield of organic farming compared with chemical agriculture. Of the remaining ownership statuses and Likert scale variables measured, none were shown to be statistically associated.
**Question 3 Summary of Findings**

Our analysis for the Likert scale variables found that farmers in the Calca region have a very positive view of the health, appearance and taste of organic produce in comparison with conventionally farmed produce. However, opinions were significantly lower regarding the price premium of organic produce, the income potential of organic farming, and the harvest yield of organic techniques in comparison with conventional farming.

Education’s relationship with opinion appears to be weak, and is difficult to encapsulate, there is no clear linear relationship. Attempts were made to see if perhaps a misunderstanding of the Likert scale was causing noise in the data, but no significant relation could be found between education and particular Likert score answers, or distributions of answers.

With regard to agricultural programs and whether or not they show any association with Likert scores, numerous tests were tried, but no significant associations could be found. It may be that there simply is nowhere else to move opinions - agricultural programs seeking to influence farmers’ perceptions of organics may find themselves trying to improve on the opinions of someone who already report a score of 5 on health and appearance. In the same vein, it could be that market conditions do not enable NGOs to push market-based opinions measures much over 3 on average due to constraints the market imposes.

We see extra evidence for the previous idea in the associations between where people sell their produce and how they feel about organics. People who sell at the market have a significantly lower opinion of the appearance of organics, possibly because they have experienced firsthand that people pass up organic produce for the larger conventional fair. Meanwhile, people who sell at restaurants, while they have a higher opinion of the health of organics, have a much lower opinion of the price premium that organics earn, meaning there may be issues with marketing to the restaurant sector in Calca. However, those who sold at Bioferias have a higher opinion of the income potential of organic farming than the average for our respondents, as well as rating the healthiness higher. It may be worth revisiting the idea of Bioferias as a way to kick start an organic market.

The last demographic attribute that appears to have an association with Likert scores is the relationship people have to the land they work. Those who work communal land have a lower opinion of organic farming’s harvest yield than those who do not participate in communal farms, while those who work on someone else’s land have a higher opinion of the price premium earned by organics at market. In the first case, it could be that communal farmers have been the
focus of organic programs before and were not impressed by the harvest yields - these opinions should be investigated further. The connection between working on someone else’s farm and having a higher opinion of organic’s price premium is not immediately clear, but one potential explanation is that those who work on someone else’s farm may not necessarily be involved in selling the produce, and so might be disconnected from the market reality.
Research Question 4: Is there a significant association between the respondent’s opinions of organic agriculture (as measured by the Likert scale) and their farming practices?

Opinion of Organic Agriculture's Effect on Farming Practices

One of the primary focuses of our research is whether or not farmers’ perceptions of organic agriculture are being translated into differences in farming practices. To measure this, the respondents answers with regard to fertilizer were analyzed with respect to their Likert scale responses.

The first step taken was to see if any of the different measures of opinion had an effect on whether the farmer did or did not use fertilizer. Our approach to this analysis was to treat the Likert scale responses as categorical so they could be cross tabulated against a Boolean measuring whether they used chemical fertilizers. All of these chi-squared tests failed to reach a threshold for statistical significance with the exception of the test cross-tabulating opinion of quantity and use of fertilizer. The outcome of that test is shown left, with the first chart showing what we should expect to find if we assume that the Likert measure has no association with whether someone uses fertilizers, and the second showing the fertilizer use as we observed it.

The difference represented in the tables is significant at the 95% level, meaning that there is a significant association between an individual’s beliefs about the output of organic and whether or not they use fertilizer. This is hardly surprising, but the fact that this is the only opinion that appears to be a driver in determining fertilizer use is important, as it points to economic incentive being the primary motivating force behind a farmer’s choice of farming practices, over and above
concerns about the health and taste of their food. The lack of findings for measures of health and taste are also unsurprising given the homogeneity of the opinions in those categories. Measures of opinions of income potential and production quantity are much more diverse and thus more amenable to analysis.

Another potential measure of commitment to organic in the same arena is the number of different chemical fertilizers that a farmer uses. To analyze this we created a numeric variable measuring the total number of different chemical fertilizers that each farmer had reported using. That variable was then used in an Analysis of Variance using our Likert measures as grouping variables. None of these ANOVA models proved to be statistically significant.

In order to measure the logical consistency of a respondents opinions across all of the above Likert questions we created an index which compares respondents opinions regarding the income earned by organic farmers to their responses regarding the price premium organic produce earns and the quantity organic farming produces. Assuming that a farmer’s income is a function of the quantity of produce they can produce and the price of they can sell a given quantity for, then opinions of organic farmers’ incomes should bear some relation to opinions of price premium and organic yield. For example, if someone answers with a 3 for dIncome and dQuantity, we would then expect the IncomeForOrganics measure to also be 3, not 2 or 4. In running this analysis we averaged their responses for price premium (dIncome) and quantity (dQuantity) and then subtracted those responses from the respondents answer for the measure of organic farmers’ incomes (IncomeForOrganics). A difference larger than 0.5 in absolute value was rendered as not logically consistent.

<table>
<thead>
<tr>
<th>Opinion of Organic Farmers' Income Potential</th>
<th>Higher Than Expected</th>
<th>Consistent</th>
<th>Lower Than Expected</th>
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<td>33</td>
<td>75</td>
<td>43</td>
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As shown in the table above, roughly half of our respondents were shown to have logically inconsistent answers, though there are a number of different things which could contribute to this being the case. For those who have a low appraisal of farmer income potential given their other responses, it could be that our design did not capture the cost of losses due to pests which are controlled with conventional pesticides, if they did not consider that when answering our question relating to the yield of organic farming techniques. In a similar vein, those who answered with a higher than expected value for organic farm income could have been reflecting the savings of not needing to purchase expensive organic fertilizers, the cost of which we did not measure. This is only a small sample of the number of extraneous factors locals may be aware of which we did not measure for.

**Question 4 Summary of Findings**
After looking for relationships between our Likert scale variables and farming practices, we found no connection between high opinions of organic agriculture and a lower rate of fertilizer use or a greater diversity of crops.

What we did find was that those who have a lower opinion of the harvest yield of organic farming methods were more likely to use fertilizers. A lower opinion was not connected with using more varieties of fertilizer, likely either due to the price of fertilizer, the fact that the fertilizers are crop specific (so you only buy what applies to what you grow) or both.

In either case this points to the importance of economic incentive in organic farming. If a farmer believes that organics do not receive a price premium and that they produce a lower yield, naturally they will use fertilizer, as lower yield will cut directly into their pocketbook. This is backed up by the data we have, which shows a lukewarm opinion of organic produce’s price premium (3.15 on average) and an association between low opinions of quantity and fertilizer use.
Additional Research Findings

Overall in our sample only a small group had participated in one of the programs on the survey. Of those that did participate in an agricultural program, the majority had participated in Arariwa, a program that has not operated in some areas of Calca in almost a decade.

With that being said, there may still be lessons to be learned from previous organic programs. For example, the 45 respondents who had participated in Arariwa had a largely positive appraisal of the program across all of our dimensions. It is surprising that an agricultural program which has not operated in some of these areas for years would have such an enduring positive appraisal – SGP ended only two years ago and people who are known participants do not even remember the program. It may be wise to do more research regarding Arariwa’s implementation and see what can be gleaned from the application of that program, despite the current difference in scope between Arariwa activities and AASD’s more focused and sustainable approach.

There have been responses both quantitatively and qualitatively stating that Peruvians believe that organic food is healthier and conventional food with pesticides is detrimental. People are concerned with the repercussions pesticides and chemicals may have on the health of their children and future generations. Unfortunately, these opinions do not appear to be translating into action. The most apparent cause for this is the poor market for organics in the Calca region. For farmers who are already low income, the cost of switching to organic farming for sale is too high to be practical.

- From an interview with a Yucay resident: “It is harder work with organics, [I] would prefer organic, but it is hard to find local markets...”

This is combined with the perception that organic agriculture cannot keep pace with the overall production of conventional chemical agriculture. This belief appears to be a statistically significant driver of chemical fertilizer use.

- A resident from Arin: “[They get] bigger and more products when they use chemicals, people want bigger produce. The preparation for organic is very difficult (collecting the animal poop) [and] it is hard to sell in the market.”

And even for those who believe there is a market for organics, there are concerns.

- A man from Huama: “We are motivated because we are starting to sell to a hotel in Cusco, but our chakras [farms] are too small for production to see larger.”
A man and woman from Huayocari: “The hotels buy [organics], but they don’t buy them from us.”

Troubling as well is an association between selling to restaurants and having a lower opinion of the price premium earned by organics. When running our analysis on sale locations and opinion we expected to find a positive association between selling to restaurants and opinions on organic’s earning potential, as there had been a lot of talk during the survey about restaurants as a potential alternative to the general market for organic producers. However our results showed that those who sell to restaurants have an even worse opinion of the price premium organics earn than those who sell at market.

With this in mind, it appears that the economic environment does not enable people to convert their feelings regarding organic produce into action. In many higher income areas there exists a fairly wide base of demand for organic produce and high end restaurants may be able to offer a premium on organic produce to satisfy discerning clientele. The conventional markets and restaurants in Calca do not provide these incentives to organic farmers, and many expressed that organic earns less money, penalizing potential organic entrepreneurs.

A woman from Lamay: “The price is a failure, you can’t make money”
A man from Lamay: “Organics have a low price so they don’t want to do it”
A woman from Huayocari: “Cannot sell them, there is no market.”

Despite the negativity with regard to more traditional markets, there is a silver lining with regard to the success of Bioferias. A popular part of ANPE’s programs in other areas, Bioferias are local farmers markets for organic produce meant to help farmers certified in a participatory guarantee system sell their products. We were surprised in our analysis to find that the most positive group in our sample with regard to organic’s earning potential were the farmers who had participated in a Bioferia. The underlying reason for this association is unclear from our data, and further research will need to be done before we can state conclusively whether this is because Bioferias produce price premiums for organic produce. However, this finding does leave room for optimism that Bioferias could be part of a larger model for improving organic market incentives for farmers.

During our time in the field, multiple people reported to us that they grow organic for themselves, while selling their non-organic produce in the market. Families tend to believe that the organic produce tastes better and is healthier, and so attempt to grow organic for their own personal consumption.

A woman from Huayllabamba: “[she] eats organic at home, knows the difference and is a big supporter of organics, it’s much better; there are more advantages than disadvantages.”
● A woman from Sacclo: “[My] family doesn’t eat food with fertilizers, organic prevents illnesses.”

Another key finding that requires further research is the connection between low opinions of organic production potential and working on a communal farm. It could be that people who work on communal farms have been the target of organic programs in the past that have failed to provide the increased income they promised, leaving these communal farms disenchanted with the organic movement. It is important to state that at the same time, their opinions on the health, taste, and appearance of organics do not vary significantly from the rest of the population, so it may be possible to re-engage this section of the population should a viable market appear.

● A male from Huayocari: “[Organic products are] healthier. But there are very few consumers.”
● A woman from Huaran: “increased income [with organics] but no market if produce is small.”

**Policy Recommendations - Areas of Focus**

**Plan for the Market**

Assuming that the desired end-goal of organic agriculture programs is to create organic farmers, the market can no longer be ignored. The battle for hearts and minds is over. People in the region have a very favorable view of health, taste, and appearance of organics, but these are not driving there farming practices. Instead, behaviors are being driven by a belief that organic cannot keep up in production with conventional agriculture. This is only compounded by the fact that the majority of people in Calca believe either that organic produce does not earn more than conventional or, worse that it earns less.

Any organization wanting to tackle the issue of organic farming in the Calca region needs to contend with this issue. There are likely a multitude of ways of addressing it, from teaching effective marketing techniques, linking buyers and sellers, or educating consumers, but any organization planning on simply educating farmers on organic agriculture techniques without improving farmers ability to market their products is failing these farmers albeit unintentionally.

It appears that farmers want to convert to organic. The market is the issue, not motivation. If quantity can be increased, or a market can be found to increase the sale price of organic produce, farmers will make the switch. Already many farmers grow organic for themselves, but produce chemically for sale. The decision to produce with chemicals is a matter of home economics and financial survival, not a matter of sentiment.
Localize for the Context

Our recommendation for organic agricultural program success is to design programs that are based on the needs and interests of farmers in the Calca region. Agricultural programs like SGP are heavily dependent on local buy in. However, SGP was developed in other countries, with other populations, and was not redesigned to the localized context, to the detriment of the individuals that the program was intended to serve. Locals need to be incorporated in the program designing process in order to create sustainable and localized programs that will meet their intended policy objectives. Translating program literature into Spanish is not localization enough (Don’t forget about Quechua!).

Maintain Focus - Don’t Spread Too Thin

One important consideration for all programs is resource allocation. Our recommendation for any organic agricultural programs that want to operate in the Calca region is to plan its footprint very carefully. Smaller, more focused programs have a number of distinct advantages.

By focusing on a specific community or group, instead of an entire region, a program becomes more flexible and responsive. If some unforeseen factor begins to derail the project or reduce its effectiveness, a smaller project may make it easier to identify and address the issue. With resources spread thin there may not be the attention or time available to recognize and address issues. By keeping a program to a manageable size, program efficacy can be maximized.

Naturally, the appropriate size of a program must be determined by the organization implementing it, given their resources and goals. For example, it is likely not a good idea to spend $1 million on an agriculture project in a single small town, but it is also not a good idea to try to cover all of Peru with the money either. Something in the middle is more desirable, and likely to lead to greater success.

While this seems obvious, the research team felt it was important to state. The research uncovered multiple stories of people interacting with NGOs and government programs that were short-lived or poorly implemented, such as SGP, which one woman recalled having hosted only two workshops and then disappearing. This is an example of a lack of focus, likely due to too wide a rollout or funding issues. A more targeted approach likely would have led to better outcomes, which in turn could have been transmitted into fundraising efforts for a wider implementation, in addition to possibly generating local interest through word of mouth. As it is, some of the people who we know participated in SGP do not remember ever taking part.

Use Existing Human Capital

Organic agriculture is a traditional practice for many farmers in the area and Organic farmers are highly underutilized resources in Calca. Government technicians and local NGOs should create an environment in which local knowledge can be shared more readily. Specifically, NGOs and local government can host workshops and seminars in which local
organic farmers share their best practices, in Spanish and in Quechua, with other farmers. Also, providing farmers with localized organic education would provide them with locally applicable skills tailored to the economic environment in the region. Play to the comparative advantages of the people in the program - leverage the knowledge of locals for teaching farming techniques that are effective and traditional to the area.

Policy Recommendations - Potential Options

Option 1:

One area of our research that surprised us was the common sentiment of farmers who grew organics for themselves and sold conventional agriculture in the market. More research is needed to determine how common personal consumption of organic actually is. If personal consumption is as common as those interviewed and surveyed have led us to believe, then future programs should capitalize on this practice. NGOs could encourage locals to create an informal market in the communities themselves. Farmers could then set up informal barter markets in their communities, bartering for organic products grown within the community. We know that these barter markets already exist as 31 survey respondents mentioned participating in them. This reflects a greater number of people than those that sell to restaurants, hotels and local stores combined. We think that further promoting this practice could provide options for increasing organic farming activity through the use of smaller informal markets where demand actually exists as a kind of incubator for organic activity.

Option 2:

We recommend putting together a focused pilot program, which will attempt to create a model for successful organic farming from seed to market. This would include training in organic agricultural requirements, farming techniques, and marketing. Ultimately farmers in the Calca region know about farming, a practice that is definitively part of their cultural identity, but they know very little about the market and how best to market their products. Farmers must learn how to market their products and will undoubtedly benefit from this knowledge.

By working with a small group of farmers in a specific area and helping them transition all the way from conventional agriculture to sustainable organic agriculture one can see and react more easily to the factors that threaten the desired program outcomes. If agricultural inputs become an issue, they can work with farmers to resolve that issue. If marketability becomes the main impediment, they can react to that as well. A model specific to the Calca region can be
created after confronting organic farming barriers then working to resolve them. The point of this program would be to use that model later on as the basis for a medium to a large-scale program.

A wider rollout could be smoother and more responsive to the needs of Calca if the literature for the program comes with solutions to the issues that farmers in Calca face. Farmers are likely to feel more comfortable and have an easier transition if the program literature for a wider implementation mentions places and people they are familiar with, and agricultural techniques by names they know.

Practically speaking, issues beyond the conversion to an organic model and turning a profit with it should be limited. Much like spreading funds and people over too wide of an area can be an issue, trying to tackle malnutrition, infrastructure, political marginalization, market access, crop yields and crop price all at once may not be wise. Putting known issues such as transportation to the side by starting in a better-connected area will allow more time for solving the problems of organic agriculture, specifically, instead of struggling with the larger issue of infrastructure. Once a workable model for marketing has been created it can be adapted for villages that are further out, or that deal with infrastructure problems, but you cannot get an idea for how to connect organic to markets if you cannot get to the market reliably in the first place.

Ethically, it is important to recognize and make clear that these recommendations are for building a model. It would be, in many ways, an experiment. We recommend choosing an area in which there are relatively well off farmers financially able to devote a portion of their fields to the effort without worrying too greatly about finances. There is no reason to endanger poorer farmers’ livelihoods when the larger question of how to link organic farmers with the market can be investigated robustly with people that are more financially resilient.

**Option 3:**

Our research indicates that individuals who have negative opinions of organic agriculture’s harvest yield are much more likely to use chemical fertilizers. We recommend that the government conduct a research project to classify proven ways in which individuals have improved organic yields. Such an investigation would require researchers going into local communities and identifying organic farmers that are able to produce organic yields comparable to yields of conventional farmers. This investigation would then determine what these individuals are doing differently in order to produce such results and share these practices on a regional scale. These solutions would be regionally based and ergo beneficial information for the entire region. It is important to localize the research to the specific area.

In general, it is important to be realistic about the workability of this option. Farmers that grow to sell and have been able to cultivate crops through organic methods at a comparative level of yield as conventional farming most likely have put in a great deal of effort in that feat. They may not be willing to share that information with others, as they would be potentially creating more competition for themselves. We think that the following considerations are necessary to guide the approach: trust, local human capital and incentives.
For one, it is necessary to consider the level of trust in the community with the entity conducting this research. Our qualitative data tells us that there are differing opinions related to government support. While some individuals expressed appreciation of government programs and local projects dedicated to supporting the agricultural sector, others expressed concern over lack of follow-through, high-turnover of government positions as well as insufficient monitoring and evaluation. (It is important to note that this information is based off of the recorder’s notes for 19 interviews). Therefore the local community must trust the entity conducting this research. Several interviewees mentioned DRAC, the Regional Department of Agriculture of Cusco, (known in Spanish as the Dirección Regional de Agricultura Cusco) although it was referenced with both positive and negative experiences. Our qualitative data tells us that 31 survey respondents had heard of DRAC and 7 mentioned participating in a DRAC related program. Since one seventh of survey respondents explicitly had heard of DRAC, they may have more credibility in some locations more than others. NGOs could be designated to conduct this research however the same issue of follow-through exists with this option. Government entities are actually the most appropriate to step in because they represent a consistent base in the community and issues of high turnover can be mitigated by proper transitional protocol for leadership. Another option that could be explored is that of partnering with local universities or institutes that have a focus on agrarian society and may have a greater potential for easily establishing trust with the community.

In addition to selecting the appropriate entity to conduct this research it is also crucial to incorporate local human capital. We suggest identifying locals that have both the skills and the enthusiasm to participate in an information-sharing venture. Some farmers may not want to share their farming practices and time should not be wasted convincing these farmers. It would be more useful to identify farmers that already have the innate desire to contribute to the greater good of their communities. We also think that incentives should be considered as an impetus for sustained participation. These incentives should be catered to the needs of that particular community or a general need recognized by farmers. Based off our research and experience in the region incentives could include: high-quality pest resistant seeds or guano de coral.

**Conclusion**

While these improvements have the potential to influence and benefit other sectors of development including health and local economies, our research has found that farmers are still facing many barriers preventing a transition to organic agriculture. It is crucial that complementary programs and policies at the local level accompany national government efforts so that farmers have access to information and resources in order to improve the production and marketing of their products and in turn, their livelihoods. Efforts must be further decentralized and increasingly promoted in order to achieve the objectives of the national movement towards organic agriculture.
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Contraloría De La Republica.
Appendix 1: Survey (In Spanish Language)

Perú: Programas Orgánicos y Agricultores Locales

Hola, me llamo __________ Vengo en representación del Instituto de Estudios Internacionales de Monterey en California. Somos estudiantes y estamos realizando una encuesta que es parte de nuestros estudios sobre la agricultura de la zona.

Este sondeo se destina solo a personas mayores de 18 años de edad. O

Esta encuesta se realizará en más o menos media hora. O

Queremos saber sobre su experiencia y su opinión personal.

Desafortunadamente, no tenemos recursos que dar a los entrevistados, solamente queremos saber su opinión. No existe riesgo ni beneficio para usted si termina la encuesta. O

Si lo prefiere, no tiene que responder a ninguna de las preguntas. O

Su participación es totalmente voluntaria y la encuesta no va a llevar tu nombre y usted no va a firmar nada. (Todas sus respuestas serán anónimas y se mantendrán en absoluta confidencialidad). O

¿Quiere participar? Sí / NO

¿Le parece bien si grabamos durante la entrevista? No todos nosotros dominamos bien el español y queremos poder entenderles perfectamente. Sí / NO

¿Le parece bien si tomamos fotos durante la entrevista? Sí / NO

Por favor, sea crítico y honesto en todas sus respuestas. No hay respuestas correctas o incorrectas.

(Si tiene cualquier pregunta, puede comunicarse con el Profesor Phil Murphy, que estará en Calca hasta el 23 de enero de 2015. Después de esa fecha, podrá mandarle al Profesor Murphy un correo electrónico al pimurphy@misis.edu)

Si tiene alguna pregunta sobre su estatus de participante en un proyecto de investigación, comuníquese con el Middlebury College o el Instituto de Estudios Internacionales de Monterey, California mandando un correo electrónico al IRB@middlebury.edu.

* Required

Datos demográficos

Antes que nada, debo hacerle unas preguntas sobre sí mismo. Si lo prefiere, no tiene que responder a estas preguntas.

¿En qué año nació usted? *

** (Interviewer: If the respondent was born after 1997, thank them for their time and ask if there are any other comments.)
¿Es usted agricultor? *
- Sí
- No

¿Cuántas personas viven en su casa? ¿Durante todo el año? *

¿Quién hace las compras para su casa?
- Hombre
- Mujer
- Ambos
- Otro:

¿Hasta qué grado de instrucción tiene esa persona?
- Si el/la entrevistado/a no es el/la jefe o jefa de hogar, pregunte: si su educación es de "Iniciací; Primaria" o "Secundaria"

¿Hasta qué grado de instrucción tiene usted?
- Si el/la entrevistado/a no es el/la jefe o jefa de hogar, pregunte: si su educación es de "Iniciací; Primaria" o "Secundaria"

¿Habla castellano y quechua? (If yes): ¿Cuál habla más a menudo?
- Si - habla castellano más a menudo
- Sí - habla quechua más a menudo
- No - sólo habla castellano
- No - sólo habla quechua
- Otro:

De la lista que vamos a leer, ¿qué servicios tiene usted?
- Un teléfono en casa (no celular)
- Un transporte motorizado propio
- Acceso a un manantial de agua
- Acceso a un puesto de salud que esté a menos de una hora de distancia de su casa
- Agua potable en casa (como la pila)/(Agua corriente)
- Desagüe
Le voy a leer una lista de programas comunitarios. Por favor, digame de qué programa o programas se benefician los miembros de su hogar.

- [ ] Luz en casa
- [ ] Del programa Juntos
- [ ] Galwana
- [ ] De Cuna Más
- [ ] De Pensión 65
- [ ] De ninguno
- [ ] Other:

¿Tiene usted hijos de cinco años o menos? (If YES) ¿Alguno de ellos ha tenido desnutrición en el último año?
- [ ] Sí
- [ ] No
- [ ] No lo sé
- [ ] n/a

Datos sobre la agricultura local
Ahora me gustaría hacerle unas preguntas sobre su chacra.

¿Es socio de una cooperativa agrícola?
If they answer yes (Sí), then indicate the name of the cooperative or a comment in “other”, otherwise, check no.
- [ ] No
- [ ] Other:

¿Es propietario de la tierra que cultiva?
- [ ] Sí, soy el propietario
- [ ] Sí, soy propietario junto con otros agricultores de una tierra de cultivo comunal
- [ ] Trabajo en una chacra que es propiedad de otra persona
- [ ] Other:

¿Tiene certificación orgánica alguno de sus productos?
If they answer yes (Sí), then enter the name of the program or a comment in “other”, otherwise check no.
- [ ] No
- [ ] Other:

¿Qué alimentos vende? ¿Cultiva alguno más que no vende?

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<td></td>
</tr>
<tr>
<td>Pepino cucumber</td>
<td></td>
</tr>
<tr>
<td>Rocoto pepper</td>
<td></td>
</tr>
<tr>
<td>Papas (para el mercado nacional) (C / V)</td>
<td></td>
</tr>
<tr>
<td>Platano macho (C / V)</td>
<td></td>
</tr>
<tr>
<td>Platano de seda u otra variedad dulce (C / V)</td>
<td></td>
</tr>
<tr>
<td>Coca (C / V)</td>
<td></td>
</tr>
<tr>
<td>other (list in comment section)</td>
<td></td>
</tr>
<tr>
<td>other (list in comment section)</td>
<td></td>
</tr>
</tbody>
</table>

¿Qué tipo de fertilizantes usa en su chacra? After they answer, ask: ¿Me los puede mostrar/enseñar?

READ LIST
- Compromaster 20x20
- Fosfato de amonía
- Cloruro de postasio
- Sumia
- Nitrito de amoníaco
- Roco fosforio
Preguntas sobre la venta de productos agrícolas
Ahora me gustaría hacerle unas preguntas sobre la venta de productos agrícolas.

¿Qué otros productos elabora usted para venderlos?
READ LIST
- Yogures
- Quesos
- Productos de repostería (pan, pasteles, galletas)
- Compost
- Miel de abeja
- Mermeladas
- Ninguno (IF NINGUNO, MOVE TO QUESTION #20)
- Other:

¿Quién se encarga de vender sus productos?
READ LIST
- Madre
- Padre
- Hija
- Hijo
- Abuela
- Abuelo
- Other:

¿Dónde vende sus productos?
READ LIST
- En una bioferia
- En un mercado local
- En tiendas
- En restaurantes
- En hoteles
- Hacemos trueque con otros agricultores

https://docs.google.com/forms/d/1Q0zFOZ9y9KZIAuJNvUCZwV5UHzMWAZlZ9jlvAvw/form?hl=es&usp=sf_link
Introducción a los pictogramas

Para las siguientes preguntas vamos a utilizar una escala con imágenes.

Para utilizar esta escala, puede señalar con el dedo o decir el número que aparece debajo de la imagen.

(Recorder needs to be standing next to interviewee. At the end of each question the interviewer must confirm the indicated number (or picture) and repeat it out loud to the recorder.)

¿Es difícil transportar sus productos al mercado o al lugar donde se venden? Para esta pregunta, uno significa que es muy difícil, cinco significa que es muy fácil, y tres significa ni difícil ni fácil

(Picto-scale)

1 2 3 4 5

Muy difícil ○ ○ ○ ○ ○ Muy fácil

Preguntas sobre la agricultura orgánica

Ahora me gustaría hacerle unas preguntas sobre la agricultura orgánica usando los pictogramas

¿En su opinión, los productos que se cultivan orgánicamente cambian en algo el sabor de los alimentos? Para esta pregunta, uno significa que el sabor es mucho peor, cinco significa que el sabor es mucho mejor, y tres significa que el sabor es ni peor ni mejor

(Picto-scale)

1 2 3 4 5

https://docs.google.com/forms/d/1RqweGq2hGPQfBBy8KZI4z3JiWJnRjC2zW9JvzH3ZmW5h20g/viewform?usp=sf_link
En su opinión, ¿qué efecto tiene la agricultura orgánica sobre la apariencia de los alimentos? Para esta pregunta, uno significa que la apariencia es mucho peor, cinco significa que la apariencia es mucho mejor, y tres que no es ni peor ni mejor (Picto-scale)  

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>La apariencia es mucho peor</td>
<td>La apariencia es mucho mejor</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

En su opinión, ¿qué efecto tiene la agricultura orgánica sobre la salud? Para esta pregunta, uno significa que es mucho menos saludable, cinco significa que es mucho más saludable, y tres no hay diferencia (Picto-scale)  

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Es mucho menos saludable</td>
<td>Es mucho más saludable</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¿Qué efecto tiene la agricultura orgánica sobre los ingresos? Para esta pregunta, uno significa que perdió mucho dinero, tres significa que no perdió ni ganó, cinco significa que ganó mucho dinero, y tres significa que ni perdió ni ganó (Picto-scale)  

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perdi mucho dinero</td>
<td>Gané mucho dinero</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¿Qué efecto tiene la agricultura orgánica sobre la cantidad de alimentos que puede cultivar? Para esta pregunta, uno significa que reduce la cantidad, cinco significa que aumenta la cantidad, y tres significa que no cambia (Picto-scale)  

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce la cantidad</td>
<td>Aumenta la cantidad</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

En general, ¿ cree que los agricultores que practican la agricultura orgánica ganan más dinero o menos dinero que los agricultores no orgánicos? Para esta pregunta, uno significa que ganan mucho menos, cinco significa que ganan mucho más, y tres significa que ganan lo mismo (Picto-scale)  

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ganan mucho menos</td>
<td>Ganan mucho más</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Por ahora terminamos con la escala. Ahora, ¿qué piensa usted? ¿Quiénes comprarían productos orgánicos?

PREGUNTAS SOBRE SU CONOCIMIENTO DE LOS PROGRAMAS DE CERTIFICACIÓN

Ahora me gustaría hacerle unas preguntas sobre organizaciones que existen en su comunidad.

Ahora le voy a leer una lista y me dice si o no. ¿A través de qué fuente recibe información sobre nuevos programas agrícolas?

- Gobierno Regional
- Municipio Distrital
- Municipio Provincial
- DRAC
- ONGs
- Un sindicato de agricultores
- Grupos comunitarios
- Otros agricultores
- Los vecinos de su comunidad
- Sus parientes
- La radio
- La televisión

Ahora le voy a leer una lista de programas agrícolas. ¿Ha oído hablar de ellos? ¿Ha participado en alguno de ellos?

READ LIST. E for Heard of, P for participated, otherwise leave blank. If answer is no, skip to question #3.

<table>
<thead>
<tr>
<th>E</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

https://docs.google.com/forms/d/e/1FAIpQLSriHFObByy9ZLAzuJMNkJ2zXYVjzHXLmW6aZ99yVJaxAf/viewform?usp=sf_link
Participantes en ANPE/AGROECO

If the respondent mentions that they participated in ANPE or AGROECO, then ask the following questions.

Refer to the "Participantes en Programas Agrícolas" survey if they participated in any program listed above including ANPE/AGROECO.

¿Mencionó que participó en la ANPE o la AGROECO? ¿Le ayudaron los talleres de estas organizaciones en el cultivo de alimentos más saludables en su chacra? Para esta pregunta, uno significa no me ayudaron en absoluto y cinco significa me ayudaron mucho.

(Píctico-scale)

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>No me ayudaron en absoluto</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Me ayudaron mucho</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¿Le ayudaron los talleres de ANPE/AGROECO a aumentar sus ingresos en su chacra? Para esta pregunta, uno significa no me ayudaron en absoluto y cinco significa me ayudaron mucho.

(Píctico-scale)

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>No me ayudaron en absoluto</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Me ayudaron mucho</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
No me ayudaron en absoluto ☐ ☐ ☐ ☐ ☐ Me ayudaron mucho ☐ ☐ ☐ ☐ ☐

En su propia chacra, ¿los métodos agrícolas que ANPE/AGROECO les enseñó, resultaron útiles para usted? Para esta pregunta, uno significa que no fueron útiles en absoluto y cinco significa que fueron muy útiles.
(Picto-scale)

1 2 3 4 5
No fueron útiles en absoluto ☐ ☐ ☐ ☐ ☐ Fueron muy útiles ☐ ☐ ☐ ☐ ☐

¿Cómo han cambiado las relaciones que mantiene con otros agricultores gracias a los programas de la ANPE o la AGROECO? Para esta pregunta, uno significa que son mucho peores, tres que no cambiaron y cinco que son mucho mejores.
(Picto-scale)

1 2 3 4 5
Son mucho peores ☐ ☐ ☐ ☐ ☐ Son mucho mejores ☐ ☐ ☐ ☐ ☐

Preguntas sobre su conocimiento de los programas de la Sistema de Garantía Participativo (SGP)
Ahora me gustaría hacerle unas preguntas sobre la Sistema de Garantía Participativa o SGP.

¿Participó en el programa de la SGP?
☐ Sí
☐ No

¿Participó en el programa de evaluación de núcleos internos?
☐ Sí, evalué la(s) chacra(s) de otro(s) agricultor(es)
☐ Sí, otro(s) agricultor(es) evaluaron mi chacra.
☐ Sí, evalué la chacra de otro agricultor y otro agricultor evaluó mi chacra.
☐ No

¿Qué tipo de fertilizantes usa en su chacra? After they answer, ask: ¿Me los puede mostrar/enseñar?
DO NOT READ LIST.
☐ Compost<br>20x20
☐ Fosfato de amoníaco
☐ Cloruro de potasio

https://docs.google.com/forms/d/1yoxQ2HnGZQObyioK2YHJQHJbHvbJi3gyAdw/form/7edj_Nip6Hre
¿Cuáles fueron los principales beneficios que ganó del programa? 
DO NOT READ LIST.
☐ Cómo vender más productos
☐ Nuevos métodos agrícolas
☐ Cómo colaborar con otros agricultores
☐ Ninguna
☐ Other:

¿Fue la SGP para su chacra mejor o peor que otros programas? Para esta pregunta vamos a utilizar el pictograma de nuevo. Uno significa que fue mucho peor, y cinco significa que fue mucho mejor.

(Picto-scale)

1 2 3 4 5

Mucho peor • • • • • Mucho mejor

En su opinión, ¿cuáles son las ventajas y desventajas de la agricultura orgánica en general?

Esa fue la última pregunta.
Gracias por haber participado en nuestro proyecto de investigación. Sus respuestas nos ayudarán a saber más de las personas que, como usted, pertenecen a esta comunidad agrícola.

¿Tiene alguna pregunta para nosotros?

https://docs.google.com/forms/d/1yoceQzHgQoB9yy9KZIAuJ0h_4JzvKHyfzZ38yVQz6/viewform?u2r=true

5/12/2015
Interviewers:
Please record the following information about the interview.

Gender of person interviewed *
- Male
- Female
- Both (male and female)
- Group of men
- Group of women

Name of Interviewer, Recorder and Photographer *
Remember, the 'Interviewer Name' field refers to you, so that you can get credit for doing this assignment. DO NOT ASK THEIR NAME. This is only about you.

Location of interview *
Specifically, where did the interview take place? Also, where generally is their household?

Interview length *
How long did it take (in minutes) to administer the interview. Please just write a number for this entry. Do not include words such as "minutes," "min.," etc.
Appendix 2

Below is a sample of our results showing no correlation between participation in ANPE and Arariwa and organics. Not all have been listed due to space constraints. We used our Likert scale results, specifically appearance, taste, health, income, and quantity and were not able to find any legitimate connections. We also looked at where they sold their produce and that did not affect our results either.

Table A1 - Basic Descriptive Statistics for Likert Scale Responses

<table>
<thead>
<tr>
<th>Variable</th>
<th>mean</th>
<th>sd</th>
<th>n</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>dAppearance</td>
<td>3.893939</td>
<td>1.1416720</td>
<td>198</td>
<td>18</td>
</tr>
<tr>
<td>dHealth</td>
<td>4.548544</td>
<td>0.8639517</td>
<td>206</td>
<td>10</td>
</tr>
<tr>
<td>dIncome</td>
<td>3.152174</td>
<td>1.1775197</td>
<td>184</td>
<td>32</td>
</tr>
<tr>
<td>dQuantity</td>
<td>2.833333</td>
<td>1.1388390</td>
<td>198</td>
<td>18</td>
</tr>
<tr>
<td>dTaste</td>
<td>4.397129</td>
<td>0.8263633</td>
<td>209</td>
<td>7</td>
</tr>
<tr>
<td>EaseProdTrans</td>
<td>2.748466</td>
<td>1.1776916</td>
<td>163</td>
<td>53</td>
</tr>
<tr>
<td>IncomeForOrganic</td>
<td>2.994382</td>
<td>1.2909822</td>
<td>178</td>
<td>38</td>
</tr>
</tbody>
</table>

*Income refers to the price premium organic produce earns over conventional produce.
Table A2 - Pearson’s Chi-Square Test for association between perception of quantity and fertilizer use.

<table>
<thead>
<tr>
<th>Expected Frequencies</th>
<th>Observed Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>dQuantity</strong></td>
<td><strong>Use Fertilizer</strong></td>
</tr>
<tr>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Much Lower</td>
<td>7</td>
</tr>
<tr>
<td>Lower</td>
<td>24</td>
</tr>
<tr>
<td>No diff</td>
<td>19</td>
</tr>
<tr>
<td>Higher</td>
<td>13</td>
</tr>
<tr>
<td>Much Higher</td>
<td>6</td>
</tr>
</tbody>
</table>

p-value = 0.04986

Table A3: Appearance Difference in Means by Market

**One-Tailed Welsh Two Sample t-test**

<table>
<thead>
<tr>
<th>Appearance by Market</th>
<th>Does Not Sell at Market</th>
<th>Does Sell at Market</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Means</strong></td>
<td>4.15</td>
<td>3.79</td>
</tr>
<tr>
<td><strong>t</strong></td>
<td>2.0254</td>
<td></td>
</tr>
<tr>
<td><strong>df</strong></td>
<td>75.343</td>
<td></td>
</tr>
<tr>
<td><strong>p-value</strong></td>
<td>0.02319</td>
<td></td>
</tr>
</tbody>
</table>
Table A-4: Health and Income Difference in Means by Sale to Restaurants

One-Tailed Welsh Two Sample t-test

<table>
<thead>
<tr>
<th>Means</th>
<th>Does Not Sell at Rest.</th>
<th>Does Sell at Rest.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health by Restaurant</td>
<td>4.56</td>
<td>4.89</td>
</tr>
<tr>
<td>t</td>
<td>df</td>
<td>p-value</td>
</tr>
<tr>
<td>-2.523</td>
<td>14.468</td>
<td>0.0239*</td>
</tr>
</tbody>
</table>

One-Tailed Welsh Two Sample t-test

<table>
<thead>
<tr>
<th>Means</th>
<th>Does Not Sell at Rest.</th>
<th>Does Sell at Rest.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income from Organic by Restaurant</td>
<td>3.04</td>
<td>2.13</td>
</tr>
<tr>
<td>t</td>
<td>df</td>
<td>p-value</td>
</tr>
<tr>
<td>2.012</td>
<td>7.826</td>
<td>0.03991*</td>
</tr>
</tbody>
</table>

Table A-5: Cross-Tabulation for Opinion of Organic Yield and Fertilizer Use

<table>
<thead>
<tr>
<th>Opinion of Organic Yield Compared with Conventional Agriculture</th>
<th>Uses Fertilizer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
</tr>
<tr>
<td>1 - Yields much less</td>
<td>8</td>
</tr>
<tr>
<td>2 - Yields less</td>
<td>15</td>
</tr>
<tr>
<td>3 - No difference</td>
<td>25</td>
</tr>
<tr>
<td>4 - Yields more</td>
<td>14</td>
</tr>
<tr>
<td>5 - Yields much more</td>
<td>9</td>
</tr>
</tbody>
</table>
### Table A-6: Ease of Produce Transport by Location

<table>
<thead>
<tr>
<th>Location</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arin</td>
<td>2.70</td>
<td>1.06</td>
<td>10</td>
</tr>
<tr>
<td>Coya</td>
<td>2.63</td>
<td>0.92</td>
<td>8</td>
</tr>
<tr>
<td>Huama</td>
<td>2.36</td>
<td>1.21</td>
<td>11</td>
</tr>
<tr>
<td>Huaran</td>
<td>2.62</td>
<td>1.12</td>
<td>13</td>
</tr>
<tr>
<td>Huayllabamba</td>
<td>2.6</td>
<td>0.84</td>
<td>10</td>
</tr>
<tr>
<td>Huayocari</td>
<td>1.94</td>
<td>0.90</td>
<td>17</td>
</tr>
<tr>
<td>Lamay</td>
<td>2.81</td>
<td>1.33</td>
<td>11</td>
</tr>
<tr>
<td>Llipllec</td>
<td>4.00</td>
<td>1.12</td>
<td>9</td>
</tr>
<tr>
<td>Saclo</td>
<td>2.73</td>
<td>1.10</td>
<td>15</td>
</tr>
<tr>
<td>Urqo</td>
<td>3.36</td>
<td>1.29</td>
<td>11</td>
</tr>
<tr>
<td>Yucay</td>
<td>2.82</td>
<td>1.07</td>
<td>17</td>
</tr>
</tbody>
</table>

### Table A-7: Opinions of Arariwa Participants about the Program

<table>
<thead>
<tr>
<th>Arariwa Effect On...</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>3.89</td>
<td>1.19</td>
</tr>
<tr>
<td>Income</td>
<td>3.42</td>
<td>1.18</td>
</tr>
<tr>
<td>Methods</td>
<td>3.75</td>
<td>1.24</td>
</tr>
<tr>
<td>Relations</td>
<td>3.72</td>
<td>0.91</td>
</tr>
</tbody>
</table>

*Income refers to the price premium organic produce earns over conventional produce*
Table A-8: Opinions of ANPE Participants about the Program

<table>
<thead>
<tr>
<th>ANPE Effect On...</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>2.83</td>
<td>1.19</td>
</tr>
<tr>
<td>Income</td>
<td>2.91</td>
<td>1.30</td>
</tr>
<tr>
<td>Methods</td>
<td>3.91</td>
<td>1.14</td>
</tr>
<tr>
<td>Relations</td>
<td>3.44</td>
<td>1.13</td>
</tr>
</tbody>
</table>

*Income refers to the price premium organic produce earns over conventional produce.
Appendix 3

Code Dictionary: Qualitative Data

1. **Tradition:** Any association that interviewees make with organic and tradition or their ancestors.

2. **Health:** Any association that interviewees make about organics being healthy and nutritious. Several references include healthy for family and children.

   Sub-categories of Health:

   **Family:** Any time that family was referred to in the comment including kids, grandparents, ancestors or family in general.

   **Sub-code of Family:**

   **Kids:** Any time that organics are specifically mentioned as better for “kids”.

3. **Conventional Agriculture:** Conventional Agriculture refers to the interviewees association of non-organic agriculture. Interviewees have associated chemical use with non-organic agriculture. It has large yields with big products but typically uses chemicals.

   Sub-categories of Conventional Agriculture:

   **Chemical Fertilizer Use:** Any time a respondent explicitly acknowledged personal use of chemical fertilizers.

   **Hormones:** Any reference to hormones as a concern of conventional agriculture.

   **Chemicals and Illness:** Any reference to chemicals as they are related to human illness or sickness.

4. **Market Negative:** Any association that interviewees make with the agriculture market being negative for organics: I.E. if there isn't a local market for organic, organic farmers sell less, and it's hard to sell organic. All references in this column are negative references to the organic market.

5. **Market Positive:** Any positive association that interviewees make with organics in the market including making more money, selling more: selling to hotels, tourists, & restaurants
6. **Production Negative:** Any reference that interviewees make about production in a negative light, i.e. organic and smaller yields, organic and organic not growing as well; products are smaller and less appealing.

   Sub-category:

   **Organic Products Smaller:** Reference to organic products being smaller in size.

7. **Production Positive:** Any reference that interviewees make about organic agriculture production being easier, less work, etc. I.e. Easier because you use guano and not??.

8. **Cost:** Any reference that interviewees make about organic agriculture being expensive, or costing more to sell, or the organic fertilizers costing more. There is also the cost of not making enough of a profit to support a family.

9. **Environmental Negative:** Any reference that an interviewee makes about crop yields being dependent on a changing environment, one that has changed the rain patterns, and an environment with more plagues and illnesses.

   Sub-category of Environmental Negative:

   **Pests:** Any reference to pests as a concern using any of the terms that were used to reference specific plagues or pests during the survey process in Peru. Pests were mentioned connected to both conventional and organic farming and therefore cannot fulfill a sub-category role. (Examples: seca seca, plaga, ataca, etc.)

10. **Environmental Positive:** Any reference that interviewees make about a positive effect that organic has on the environment: no contamination, healthy environment, or organic being better for the environment.

11. **No Disadvantages:** Any Reference that the interviewee mentions about organic not having any disadvantages or none that they can think of.

12. **Uncertainty:** Any reference that the interview makes of uncertainty, not sure if organic is good or bad or just unfamiliar.

13. **Entrepreneurship:** Any reference that an interviewee makes about wanting to work and sell organic agriculture to hotels, restaurants, or tourists. Or anyone that thinks highly of the farmers that already work with organics.
14. **Personal Consumption:** Any reference that the interviewee made about eating organics in their home or growing organic for their families and personal consumption.

15. **Organic Preference:** Any reference an interviewee made about organic being better without really adding a qualifier, just that organic is better.

16. **Taste:** Any reference that interviewees made about organic produce having a better taste and flavor.

17. **Lack of Awareness:** Any reference that the interviewee makes about a lack of awareness about organic agriculture, lack of information, and others "don't value it." One interviewee goes, as far to say, "People in the city are stupid because they don't know what they are eating."

18. **Organic is More Work:** Any reference to organic or organic farming as requiring more work or effort.

   **Sub-category of Organic is More Work:**

   **Hard:** When an interviewee explicitly says that organic agriculture is hard work, one where one has to exert a lot of effort, or more work than usual.

19. **Risk:** Any reference that interviewees make about organics being less reliable, or having no guarantee, or the risks associated with working with organics especially the risk of not having a market to sell organic products.

20. **Savings:** Any reference that an interviewee makes about spending less money because of organic agriculture, spending less on fertilizers and spending less on medication, etc.

21. **Organic Natural:** Any time that the term “natural” was explicitly used to refer to organics.

22. **Preference to Chemicals:** Expressing explicit preference to using chemical fertilizers or conventional agriculture, which is usually associated with chemical use.
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*Codes in italic and underline indicate sub-codes*
Appendix 4

Qualitative Analysis of Semi-Structured Interviews

21 semi-structured interviews were conducted and recorded during our field research. Unfortunately these recordings have not been professionally transcribed therefore our analysis relies on recorder’s notes which were available for 19 interviews. Although in an academic context researchers felt it would be inappropriate to include this section in our analysis, morally it felt wrong not to include a discussion of the semi-structured interview responses and we feel confident that we are able to accurately express their sentiments. Many of the interviewees were identified by AASD as important stakeholders with significant experience with organic agriculture in greater Calca province. As local knowledge brokers these individuals were able to offer an overview of organic agriculture in the region. Some interviews came about spontaneously while surveying or visiting the local market and provided complementary perspectives. We believe that this section is important to include because important themes emerged shedding light on new insights not represented by our other data.

Environmental Concern

Several interviewees in relation to pollution, changes in weather and soil health, expressed environmental concern. Multiple individuals expressed concern over hotter weather but then elaborated to specify different additional concerns such as having to water more often, skin cancer and concern for global warming in general. Many community members mentioned that the soil has become accustomed to chemical use while others simply stated that the land isn’t the same anymore referred to the land. Sentiments that we have mentioned throughout the paper of organic requiring more work and producing less were also echoed. In reference to pollution, individuals expressed concern for future generations that the land is being contaminated and that production is not the same as it used to be. References were also made to the proliferation of new strains of pests attacking crops and the difficulty of managing these infestations especially with organic techniques. 4 interviewees commented on the importance of preserving seeds with some mentioning that older varieties are more resistant to pests but today are more expensive to purchase in the market.

Agricultural Support

Another common theme throughout the interviews was mention of the lack of follow-through in agricultural programs. Interviewees referred to lack of leadership, early termination of programs and insufficient monitoring and evaluation. Some interviewees also referred to high turnover in the government leading to difficulties in the sustainability of projects. Several respondents also commented on the need for more inclusive programs, greater access to training, more relevant subject matter of workshops and the need for incentives. Certification programs were specifically referred to as lacking organization and follow-up support.
Positive references were also made in regard to government support including appreciation for workshops, trainings and resource assistance. Multiple interviewees in both negative and positive contexts mentioned the regional entity of the government that focuses specifically on agriculture, DRAC. While some think that DRAC can do more to support the agricultural sector and local farmers, others have benefited from supportive efforts initiated through DRAC.

Last, in reference to agricultural support an additional insight was brought to our attention. Several interviewees mentioned barriers to program entry and inability to participate or earn certification as an individual, which brings to bear a concept that requires further research to see if individuals in organic programs do indeed face additional barriers.

**Market**

Market concerns were also highlighted throughout these interviews. Several interviewees explicitly mentioned the need for training in how to sell products. One local farmer provided a very clear framework for future trainings: “For people new to organic, they need technical help. For people with experience, for example those who are already producing, they need help with selling, distribution, finding a market and also certification.” Interview responses also highlighted the issue that consumers do not value organics for several reasons including lack of awareness as well as concern for appearance and cost. An interesting new insight was brought to our attention by one interviewer who identified commercial sellers as barriers to market access.

Additional insights included concern for future generations and recognition of the potentials of organic agriculture to improve health of community members and family. Also, several interviewees placed an emphasis on working with youth and educating the next generation on the importance of organics.