Effects of Natural Disasters on Farms in the San Luis Obispo Region, California

A Service-Learning Project

2009-10

Applied Environmental Anthropology Research Group at Northern Kentucky University

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Assisted by students of fall 2009, winter intersession 2009, and spring 2010 independent studies courses (Brandy Blust, Matthew Buttacavoli, Timothy Carpenter, Emela Halilovic, Kevin Talbert, and Michael Washburn).

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APPLIED ENVIRONMENTAL ANTHROPOLOGY RESEARCH GROUP

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Introduction

This report documents a service-learning project that evaluated the economic and social effects of natural disasters on farmers in and around San Luis Obispo, California, through applied anthropological ethnographic research. In partnership with the Scripps Howard Center for Civic Engagement (SHCfCE) and funded by a Learn and Serve America Grant, Douglas Hume (Assistant Professor of Anthropology at Northern Kentucky University [NKU]) and six NKU undergraduate anthropology students (Brandy Blust, Matthew Buttacavoli, Timothy Carpenter, Emela Halilovic, Kevin Talbert, and Michael Washburn), who were part of the Applied Environmental Anthropology Research Group (AEARG) at NKU, interviewed farmers in the greater San Luis Obispo area during the winter intersession of 2009-10. Farmers were interviewed to discover the following:

1. how do farmers define natural disasters;
2. how do these natural disasters affect the farmers' quality of life (in particular what aspects of health, education and economic behavior change as a result of natural disasters); and
3. what networks exist to provide social and economic support in response to natural disasters?

Methods

In preparation for this research project, six of the nine student applicants were selected based on academic merit and seniority in the Anthropology Program at NKU. These six students enrolled in an independent studies course during the second session of fall 2009 in which they were trained in ethnographic interview methods (McCurdy, Spradley, and Shandy 2004) and logistical planning for the project was completed. In addition to ethnographic methods, students were trained in research ethics involving human subjects in accord with the Institutional Review Board requirements at NKU to ensure that the specific farmers with whom we spoke with were protected from any ramifications from their participation in this research.

During the fall preparation and winter intersession fieldwork in California, the SHCfCE administered the Learn and Serve America Grant. Michael Walther, SHCfCE Civic Engagement Coordinator Assistant, managed the financial and logistical support that SHCfCE provided for this project. Christina Gunn, SHCfCE Secretary, coordinated all travel arrangements. Chatodd Floyd, AmeriCorps VISTA Volunteer, contacted potential informants in California and organized a schedule of farm visits and farmer interviews.

The field research was conducted from December 20 2009 to January 9 2010. AEARG members collected ethnographic data by interviewing 62 farmers in and around San Luis Obispo, California. The informants were interviewed at their work sites, whether on farms or at farmers' markets. Interviews at farms were scheduled whereas interviews at farmers' markets were arranged on site. The number of students conducting each interview ranged from one to four students per informant with the norm being two students per informant. The field notes the students took both during and after the interviews augmented the digital audio recording of interviews. Douglas Hume, the instructor and AEARG Director,

documented the events and places that were visited though field notes and digital photographs. The digital audio files, transcribed notations, and photographs collected in the field were electronically archived for future use during data analysis.

After transcribing the 62 interviews, the digital audio recordings were destroyed per the Informed Consent Statement (see Appendix I). The transcriptions were then analyzed by word count and the identification of informant statements that addressed one or more of the three themes of this research: 1) definitions of natural disasters and the effect of these natural disasters on 2) quality of life, and 3) support networks. Initial results of the text analysis were presented by the students at NKU's Celebration of Undergraduate Research (see Appendix II). The final report was written during the 2010 spring semester.

Findings

In general, farmers reported that while natural disasters are a constant risk to the economic viability of their farms, they were optimistic that their knowledge of the environment would enable them to adopt strategies that would minimize or mitigate the risks and enhance the likelihood of crop success in a dynamic environment with variable conditions. Though the farmers differed in their definition of what comprised a farming community, they were in agreement that the best strategy to overcome adversity was to rely upon the farming community, rather than governmental aid. The term natural disaster is most commonly defined as being a highly destructive environmental phenomenon (e.g., volcano eruptions, earthquakes, and tsunamis) that indiscriminately impacts a large geographic area, farmers expand this definition to include events that are more localized (e.g., microclimates) and have targeted impacts that are inclusive of those things that are crop specific (e.g., frosts and diseases). In the following sections, the specific findings on how natural disasters affect quality of life, how farmers use networks of social and economic support, and definitions of natural disasters are described.

Definition of Natural Disasters

When asked about their classification of natural disasters, several farmers described the popular culture schema of natural disasters, which include large, catastrophic events that can create widespread damage to structures. Though many farmers lose as much as 20 percent of produce to pests, this occurrence is not considered a natural disaster but a cost of business, an acceptable and expected loss which is figured into total yearly production. As one farmer said, a natural disaster is "any damage that is unwarranted or unexpected" beyond this expected loss. Many environmental and biological disruptions cause production loss, but only a few are considered natural disasters. Though there are variations in farmers' individual definitions of natural disasters, there appears to be a general agreement that a natural disaster occurs when a natural event has a significant catastrophic disruption to some portion of the processes of growing, harvesting or transporting agricultural products to the consumer.

Descriptions of types of natural disasters by the farmers interviewed fit into two broad categories: environmental and biological natural disasters. A working definition of natural disasters varies depending on what individual farmers have experienced in the

past and what they view as future threats to their production. When asked, the informants were able to provide a list of natural disasters that have an immediate effect on agricultural production, many of which do not necessarily meet the criteria of the standard definition of natural disasters, as "any event or force of nature that has catastrophic consequences, such as avalanche, earthquake, flood, forest fire, hurricane, lightning, tornado, tsunami, and volcanic eruption" (Dictionary.com 2010).

Of the two categories of natural disasters, environmental disasters were more commonly cited as being problematic for farmers. The most common types of environmental disasters are weather related events. Temperature related events such as freezes and frosts were implicated most frequently by farmers as causing the most intensive crop damage. Wind damage was mentioned approximately half as frequently, but was mostly limited to damage to trees, especially if the trees were in fruit. High winds could also cause structural damage, mostly to greenhouses, though not commonly cited as causing significant crop damage. Storms, however, with both high winds and hail can be devastating to fruit crops. Informants reported that sunburn of fruits and vegetables may also damage crops, but occurred less often than other weather related crop damage. Flooding can also have adverse affects on farm production. For example, one farmer lost an entire broccoli crop to flooding while two other farmers claimed flooding impeded their ability to bring produce to market. Natural disasters, in this case flooding, do not only impact production, but also distribution of produce. In cases when drought was mentioned, most farmers spoke about the current four-year drought that they fear will continue to impact their ability to grow crops, at least, in the near future. The farmers often mentioned earthquakes and fires, but farmers reported that these types of disasters had little effect on the farms, as earthquakes only cause minor damage to structures, not crops, and wild fires affecting farms are rare in this region of California.

According to farmers, while the frequency of biological disasters may be higher than environmental disasters, they seem to be less catastrophic. This may be due to the preventability or treatability of biological factors. Animal activity, such as small herbivores, gophers and squirrels, were cited as most common type of biological natural disaster that affects crops. Large herbivores, such as deer and wild boars, can cause widespread damage to ground crops and young trees, but are preventable with proper fencing. Carnivores are a problem for those farmers who also raise livestock, with mountain lions and bears being reported as responsible for livestock deaths. Insect pest activity, such as aphids and husk flies, may decrease production or damage produce so that it may not be sold. Informants reported that birds cause direct damage to grapes and berries through consumption or by spreading diseases. Birds and other biological pests may be prevented by various means (e.g., traps and netting) and do not pose a large threat to crops, but do raise the cost of production.

Disease-causing agents are another subtype of a biological disaster. Viruses and fungi are more commonly cited as affecting fruit and nut trees than annual vegetable produce and, therefore, long-term and costly investment is needed to protect fruit and nut trees, which take many years to mature. Disease was cited to have the potential to destroy an entire orchard and is the main reason one informant refused to adopt solely organic

practices even though she believed that organic farming was better for the environment and people that consume the produce.

A few farmers who were interviewed indicated that artificial (e.g., economic and political) events amplify the affects of natural disasters. While not a category of natural disaster, amplifying events may have many of the same economic results. Farmers often cited the current economy as the cause for lower sales. Bank loans and crop insurance become more difficult to obtain during a recession. Over-regulation may prevent the preferred treatment of a disease or infestation. Finally, water laws due to drought concerns may limit the amount of water that the farmer can give to his or her plants and lead to further crop issues.

Quality of Life

The quality of life of the farmers that were interviewed is affected in both preparing for and responding to perceived natural disasters. For example, extreme events can directly compromise health through disrupting water supply or access to medical facilities as well as generally increasing the likelihood of accidental injury. Loss of crops can mean loss of variety and nutrition in diet by the loss of foods consumed by the farmers and loss of income with which to purchase food. Prolonged financial difficulties cause long-term stress, which compromises biological immune systems and contribute to a large variety of other health concerns. Resources redirected to disaster response or preparedness (e.g., purchasing and installing greenhouses, removing flammable brush, installing new wells and irrigation) are unavailable for routine healthcare or health insurance.

It is believed that when farmers utilize sustainable farming techniques (e.g., bio-dynamics, permaculture, organic farming), they may protect against future natural disasters and improve the health of individuals working on the farm and consuming their produce. In addition, farms growing a variety of crops in hopes of preventing total crop loss in the event of a natural disaster can result in reduced outflows of chemical pollutants, having an ancillary benefit to the health of the surrounding environment in which the farmer lives. These sustainable practices are seen as a substitute or partial substitute for healthcare insurance by introducing a nutritious diet that benefits the farmer and the community by reducing the future cost of medical expenses.

Changes in farmers' economic behavior brought about by the impacts of natural disasters are expressed by increased spending of preventative measures, short-term economic loss due to decline in crop production, and impact of crop loss on the local economy. The increased spending on preventive measures (e.g., green houses, fertilizers, and irrigation) leads to short-term financial loss and, at the same time, an investment for future crop protection enabling long-term financial security. The severity of the event determines if the farmer experiences short-term and/or long-term economic loss due to crop reduction. Depending on the duration, the inability to meet consumer demand can be a short-term financial loss that can lead to a long-term economic hardship. The consumer may opt to seek other suppliers if the farmer is unable to supply a product in a timely and consistent manner, thus affecting the farmer and the local economy. The businesses with which

farmers rely on (e.g., farm stores and labor contractors) also have a stake in the farming community and any altered state of economic behavior on a farm has an effect on the local economy.

Farmers may go years without experiencing a governmentally recognized natural disaster while continuously coping with challenging weather events that some consider normal, and others consider natural disasters. Farmers' experience equips them with the knowledge to manage these individually catastrophic events and minimize potential damage. Occasionally an unusually extreme and unforeseen natural disaster causes unanticipated damage and economic loss. These natural disasters reveal previously unknown vulnerabilities. Unexpected losses motivate individual farmers to modify their farming practices. Seeking appropriate responses, these farmers engage in new learning behaviors. These behaviors include devising experimental tests and agricultural techniques, researching appropriate practices on the Internet, consulting the farming community, and occasionally seek advice from government agricultural agencies. These efforts may also result in relief provided by the community in the form of donated labor. If such relief is needed and available, it usually arrives quickly due to the connectedness of local farm communities.

Social and Economic Support

For the most part, the San Luis Obispo area's farmers' main resources during natural disasters are themselves. Most often, farmers reported the reasons for this self-reliance was due to having a personal ethic of independence or having not received either adequate or timely reimbursement from the government assistance programs when aid was requested. One farmer said that he did not feel that it was ethically correct to take money from the government saying: "it's my choice [to take on the risk of farming]. I mean it's like going to Vegas. I mean a person goes to Vegas it shouldn't be anyone else's responsibility to bail them out." Several of the farmers stated that they believed the government takes too long to provide assistance or that it was too much work for the small amount of aid that was awarded. Several farmers also stated that another reason they did not use the government was because of their lack of knowledge about the availability of assistance. Some farmers, who did apply for aid, still did not receive any, as they did not meet the governmental requirements for aid distribution because their organic farm was small-scale and did not rely upon irrigation. As one farmer stated, "I was so furious when I walked out of the USDA's office. I was like okay, so because I am doing the right thing [being organic,] I don't qualify for any support."

Farmers stated that they attempted to prevent or lessen the effects of natural disasters by their choice of location, diversity of crops, and timing of harvests. Farmers reported that it was important to understand the characteristics of the land both for choosing the location of fields, but also for the best time to plant and harvest particular varieties of crops. There appears to be agreement among farmers that by understanding the land and plants one can reduce the impact natural disasters have on crops. One method that was reported to work for small-scale farmers was diversifying their crops to ensure that a minor natural disaster (e.g., isolated frost) would only affect part of the farm's total crop

yield. One farmer explained that "real farmers [that are] really connected to nature are self insured [because] you can't be connected to nature and have a mono-culture."

In another attempt to create support mechanisms against farm losses due to natural disasters, farmers utilized farmers' markets and Community Supported Agriculture (CSA) cooperatives to find customers to purchase their produce as well as making lasting connections with the community at large. Merchants and farmers interviewed at each of the farmers' markets expressed how they were pleased with the opportunities that the farmers' markets gave them to sell their produce on a weekly basis and create lasting relationships with their customers, who are often referred to as regulars. Many of the customers were willing to support local farmers by paying slightly more for the local produce at the markets or CSAs versus buying similar produce at the grocery store. Many small-scale farmers expressed that farmers' markets and CSAs are the only real alternative to selling their produce wholesale. Community members who take part in a CSA often wish to support locally grown produce more than those who shop at the farmers' markets.

There is a variety of ways farmers rely on other community members as well as other farmers, most often, physically, financially, and/or intellectually. Many of the farmers that were interviewed reported that they asked other farmers in their community to help with physical labor on the farm due to unforeseen circumstances such as a sudden frost during which crops needed to be covered quickly. Farmers also stated that they received financial assistance from other farmers and community members through fundraisers. Finally, farmers described how they shared ideas with each other to enhance each other's farming techniques. This was most common with farmers that were devoting all or part of their crop to organic produce.

Similar to how farmers in the area relied on the community, they also relied on family and friends financially, physically, and intellectually, as well as emotionally. Many farmers said that they asked for physical labor help and borrowed money from their family and friends in time of need. Friends and family were a valuable resource to many of the farmers, whether they needed help starting a new farm or on a well-established farm with the daily work. Family and friends were also described as an outlet for the emotional struggles that occur during farming in general as well as preparing for or recovering from natural disasters.

Conclusion

This service-learning research project has found preliminary answers to the three broad research questions investigated with farmers in the San Luis Obispo area. First, farmers consider a much broader set of phenomena to be categorized as natural disasters than the standard definition contains. Second, natural disasters, in their extended meaning as used by farmers, affect farmers' quality of life mostly economically, which then may affect health and, to a lesser extent, education. Finally, farmers choose to respond to natural disasters by being self-reliant, building cooperative communities, and seeking aid from their families. Much more work is needed to understand the variation that exists among the San Luis

Obispo area farmers in their understanding of and response to natural disasters. However, the reliance on internal support (e.g., self, community, and family) rather than external support (e.g., federal, state or other local aid agencies) suggests that a community-based system of agriculture may be a better fit for this region than a top-down regional agencies approach for managing risks and damage from natural disasters.

Appendix I

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INFORMED CONSENT STATEMENT

Principal Investigator: Dr. Douglas Hume, Northern Kentucky University

Title of Study: Effects of Natural Disasters on Farm Laborers

Introduction

You are invited to participate in research about the effects of natural disasters (e.g., fires, earthquakes, floods, and droughts) on farm laborers in the greater San Luis Obispo area. It is hoped that the results of this research will assist government and non-governmental organizations in providing aid to farm laborers in the event of a natural disaster.

Your participation in this study is voluntary. You may choose to stop participating (withdraw) at any time without penalty. You will not be paid for being in this study.

The interview is estimated to last approximately one hour.

Confidentiality

The audio recording of the interview will be securely stored and destroyed after it is transcribed. Data collected in this study will then be anonymous, as we are not collecting names or other identifying information.

We may ask to take pictures of your interview, but your participation is voluntary and your picture will not be taken without your consent. If photographs are taken, they will not be directly connected with your interview data.

The results of this research will be published on the Internet, journals and conference proceedings as well as a report available to governmental and non-governmental organizations involved in agricultural disaster preparedness.

Contact

If you have any questions or concerns, please feel free to contact the Primary Investigator, Douglas Hume, Ph.D., Assistant Professor of Anthropology, Northern Kentucky University, at humed1@nku.edu or 859-572-5702.

Questions about your rights as a participant of this research may be directed to Philip J. Moberg, Ph.D., IRB Chair, Northern Kentucky University, at either mobergp1@nku.edu or 859-572-1913 The IRB is a group of people that reviews research studies and protects the rights of people involved with research.

Effects of Natural Disasters

on Farmers in San Luis Obispo County, California

Timothy Carpenter, Brandy Blust, Matthew Buttacavoli, Emela Halilovic, Kevin Talbert, and Michael Washburn

Students interviewing grape, persimmon, and walnut farmers.

Interviewing an organizer of a local Community Supported Agriculture Project.

Two students interviewing a farm store owner.

Students interviewing an organic apple farmer.

Students planting plugs of broccoli and kale at the Cal Poly Organic farm.

Students interviewing a pumpkin and squash farmer.

Two students interviewing a farm laborer at a commercial winery.

Students interviewing the farm manager at the Cal Poly Organic farm.

Abstract:

This research project examines the impact of natural disasters on farm laborers and owners in San Luis Obispo County, California. Ethnographic interviews of 62 informants combined with participant observation were conducted from December 2009 to January 2010. Text and theme analysis of interview transcripts were used to identify the effects of natural disasters and the social mechanisms to mitigate their impacts. This poster illustrates the ethnographic process of data collection and the main themes discovered utilizing text analysis.

Research Methods:

This qualitative research project took place over the winter break in San Luis Obispo, California. The research steps included the following:

1) An AmeriCorps volunteer contacted farmers to schedule interviews with informants
2) Six students and one faculty advisor traveled to the San Luis Obispo to meet with and interview informants
3) Interviews were conducted with each informant by at least one student, but most often in pairs
4) The following themes were explored during interviews:
   - how natural disasters affect their quality of life (in particular what aspects of health, education and economic behavior change as a result of natural disasters)
   - what networks exist to provide social and economic support in response to natural disasters
   - what systems of meaning are created and maintained as a result of natural disasters
5) Interview notes and digital audio recordings were transcribed
6) Interview transcriptions were analyzed for themes using AtlasTI 5.5

Natural Disasters' Affect on the Quality of Life

"And I know there are products out there that you can spray on for sun spots and things like that but my (in) my location ... it's so rare I didn't see it coming. I wouldn't have had time to prepare. No one saw it coming in our location."

"And when fuel prices are up to five fifty a gaton in the summer and that really hurts. So we have had to eliminate all our crops from this side of the hill but we still have been able to keep production up so it hasn't been a huge impact. It's meant more work but it hasn't meant we don't have the income for the next year's crop."

"Because people do not want to buy plants when its dry, they want to hold back so I have to change what types of crops I grow. So in essence I am going more towards succulents and drought tolerance right now than I have in the past."

"Economy, it's the economy right now. The economy is the biggest affect, drought is probably the second on the over all performance and sales without a doubt."

"For me with the water? No, not at, in all five years we've been there, so this is unusual for being that low. But, we also have more intense farming around us than we ever had."

"No, the economy right now affects electricians and other people but not farming, you may drop your sales a little bit but not completely. People have to eat, good or bad."

"It's like five years ago. We pretty much loss an entire crop of tomatoes that we had in there in June. We had some freak warm weather in June. It was like the worst time to have hot weather."

"How I wasn't able to cover these guys and the frost came through and you can see how it burned ... that translucent patch and they just rot right away. That's what an early frost looks like when the pumpkins are still out in the field and we end up using them for cattle feed but fortunately it's a good source of creatine and vitamin A and what not, so it's great for the cattle but it's hard taking that loss."

"It would affect sales too, let's just say there was a big earthquake somewhere, but that, you never know about that. But a big one your whole economy could go to heck for a long time."

"Talking about natural disasters, if we don't get any more rain this year, I may not be able to farm."

"No not really, the only affect I have ever had was during the last earthquake we had a couple years ago. Earthquakes are not a big thing around here, not that they can't be, but the aren't. I've been here for twenty years and I have experienced only one earthquake."

"Especially that last year because coming from a dry year and going right back into a dry year our production went way down. Production of walnuts went down probably 50% of production this last season."

Social and Economic Support in Response to Natural Disasters

"And the customers got behind it and advertised, because we needed to find a spot and they helped us get this place, so I think farmers' markets are, especially in this town, well supported by the local population."

"And we are not willing, you will see people spend sixty, eighty dollars a month to make sure they have cable TV and internet and all that other crap. But they will bitch and moan if the cost of a tomato is three bucks a pound."

"Here we have a big convertional farm that does organic, two that do organic as well, mostly because the customers demanded it. So their conversion to organic came from the customer, but there are not many producers."

"I think now that money is so right you find a lot of collaboration, we just need to be more creative."

"Didn't have enough for a crew, so we just said to our neighbors, 'could you come help us for three or four hours?' Sure hey. They come down the hill. We swap back and forth. They come over sometimes and we go there. The guys, we send them down there. It works out fine. We want to be neighborly, be in contact with everybody. If you have problems, if you need a tractor and yours is down ... they can come out and give one. Then you may need something for a crew out there, you work it out."

"Everybody kind of knows everybody."

"(M)y family is the farm, we do our own work. I am not sure how to answer that, it is just my family."

"Even though the economy has been really bad it hasn't affected our end of it yet. People have been willing to pay money for high quality produce, and coming to farmers' markets so we haven't really been hit as bad as a lot of other folks."

"Everyone respects each other, we go to him to see what we do and we do that, he's usually in it with everyone, he works as hard if not harder than everyone else, so it's good to see, because this is his livelihood, he leads by example, so he's working, so we should work."

Systems of Meaning as a Result of Natural Disasters

"Hugo Chavez, you know, former president of Venezuela, made a great comment at the end of Copenhagen, he says, 'If the environment were a bank we would have fixed it by now'."

"I feel like they are regulating us out of existence. It is hard because they don't have any thing on the books for us being a farm store, or if you are a winery they said we can either meet the requirements for a Seven Eleven or a Circle K or if we have the audacity to wash our produce we would have to be a food for less."

"I had a gentleman upset that my that I was selling pumpkins for four dollars and he got it at Walmart for two bucks. Of course the growers in the valley with the state water, and of course they can sell pumpkins for cheaper."

"I have been here twenty-five years. So whatever you can see around, I did."

"I think because people don't know where their food comes from, don't have any idea ... we are working an organization and one of their initiatives is a farm-to-school lunch program, and its been really difficult to get the school districts to buy locally, the foundation is giving them money to do it because it just doesn't come from them to by locally."

"I feel really good about people who look at our organic system plan, seeing what we actually do, being completely transparent. Some people won't buy things that are not certified organic."

"I think that this is a community that has had a farmers' market history for a long time. The Thursday night farmers' market down town is San Louis Obispo. They close off the street and it's like a big party in addition to being a famers' market."

Contact Information:

The authors wish to thank the community members of San Luis Obispo, California, who took the time to share their insight and opinions with us. This service-learning project was funded by a Learn and Serve America Grant administered by the Scripps Howard Center for Civic Engagement. This research project was conducted by members of the Applied Environmental Anthropology Research Group at Northern Kentucky University (http://aearg.nku.edu).

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Appendix II

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