

SEEDS 9TH LEADERSHIP MEETING
*Food Security and Food Justice: Sustaining
Agricultural Abundance and Healthy
Communities*

REPORT

Fort Collins, Colorado

April 9-13, 2014



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Photo credit: Fred Abbott-Torres

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Introduction

Over the span of five days, 26 passionate students from 24 institutions across the United States came together in beautiful Fort Collins, Colorado to learn and lead discussions regarding the theme of the Leadership Meeting – ***Food Security and Food Justice: Sustaining Agricultural Abundance and Healthy Communities***. The Ecological Society of America's (ESA) 9th Annual SEEDS Leadership Meeting was held in Fort Collins, Colorado from April 9-13, 2014. The meeting was held at the USGS John Wesley Powell Center and at Colorado State University, hosted by Dr. Jill Baron, ESA President 2013-2014.

The program was made possible with funding from the National Science Foundation, contributions from ESA members and support from Colorado State University College of Agricultural Science.

Participants were nominated by faculty advisers from Campus Ecology Chapters affiliated with ESA's Strategies for Ecology Education, Diversity and Sustainability (SEEDS) program.

The participants were very interested in the subject and were eager to start the discussion and learn about the implications of ecology relating to food production and food security. As an ecology program we realized the need to educate the next generation of ecologists on what to expect, how to understand fundamental issues underlying food production and security. The overarching questions during the meeting shaped the program: What food production challenges are we currently facing worldwide? How will we be able to feed 9 billion by 2050? How can ecology help shape the future of food production?



*Photo taken from the UN Food and Agriculture website
<http://www.fao.org/urban-agriculture/en/>*

Day 1: Wednesday, April 9

ARRIVALS AND WELCOMES

The meeting began on Wednesday night with a meet-and-greet session with the students once they arrived at the Best Western University Inn just outside of the Colorado State University campus. During this meet and greet, the students enjoyed a catered dinner and a few fun activities for them to get to know each other. Students introduced themselves, their institutions, shared their interests and their backgrounds. SEEDS staff, Fred Abbott, welcomed students and talked about the expectations for the meeting with the group and ESA



Figure 1 Fred Abbott (left pop up) Students completing a getting to Know You activity

President, Dr. Jill Baron, welcomed all of us to her home town of Fort Collins, Colorado and talked to the participants about ESA. Dr. Baron also mentioned her work with the US Geological Survey and encouraged students to be leaders that can question challenge and think outside the box for solutions.

Day 2: Thursday, April 10

WORKSHOP 1: FOOD SECURITY AND THE CHALLENGES OF FOOD PRODUCTION AND DISTRIBUTION

Presented by Dr. Raj Khosla (Soil and Crop Sciences, Colorado State University) and Dr. Nancy Irlbeck (Associate Dean of the College of Agricultural Science at CSU)

Dr. Raj Khosla introduced the theme and discussion about global food security. He stated that the world human population is already reaching 7 billion and projected to reach 9 billion in the next 36 years. With a current world food shortage of 7% – how can we increase food production and still be sustainable? If we want to make the planet food secure, we need all the best ideas for a safe, sound and food secure planet.



Figure 2: Dr. Jill Baron, Dr. Raj Khosla and Dr. Nancy Irlbeck (L-R)

With the advancement of technology over the last century, harvesting has become much more efficient with numbers increasing from 50 bushels a day in the 1900's to 1100 tons a day by GPS guided combines in this century. Yet, there are 1 billion humans without adequate food on a daily basis. **In the US, 1 in every 7 Americans is food insecure.** Dr. Khosla mentioned some of the major challenges for food production are environmental degradation, climate change, water and energy.

Some of the solutions to this problem seem simple enough – produce more, eat less, waste less! That last one is very important – **in the US an average of 40% of food produced is lost due to waste.** Poor storage infrastructure, lack of market accessibility, poor transportation systems and consumer waste are some of these major issues with food losses. Many companies in the US are aiming for a 20% reduction in food discards by 2020. With many of these issues still requiring actual change, what can we, as consumers and scientists, do?

“Food is the moral right of all who are born into this world.”

~ Norman Borlaug

Dr. Nancy Irlbeck led the discussion on the changes that are happening to solve these issues. As a brief overview of the history of agriculture, there are 5 major time periods 1) Hunting and gathering 2) Agriculture 3) Intensive agriculture 4) Industrialization of agriculture 5) Quality of life era – The *Locavore* movement. In order to understand these ideas and make change happen, we need to share ideas from people with different backgrounds that harness different methods. Governments have to take a holistic approach where food production is only one component; they need to relate it to trade, health and transportation.

What are the effects of large scale food production on the environment? It is a well known fact that agriculture creates a lot of runoff of fertilizers and pesticides that go into surface and ground water.

Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.

Meat production increases the amount of nitrogen from manure and urine that goes in the air. This nitrogen travels long distances and can reach areas that are protected causing a loss of ecological diversity due to these agricultural practices. Overharvesting of ocean protein has caused populations of commercial fish to dwindle and require protection.

So how can we change these practices? Culture change takes a long time; we need to go back to an agriculture culture. In the US, there are many practices that do not help this cause, with most of the protein coming from livestock and not fish or other types of animals or environments. There is a need for new dietary guidelines and alternate sources of protein, for example – Insects!

This discussion really opened the eyes of the entire group and offered them a glimpse into the theme of the meeting. It made participants realize that this is a HUGE problem that needs to be taken on by ecologists – present and future – to improve the quality of life for all organisms.

WORKSHOP 2: MOVING TOWARDS A SUSTAINABLE FUTURE

Presented by Dr. Sharon Collinge (University of Colorado and ESA VP for Public Affairs) and Liz Wolfert (Owner of Spring Tiger Farms)

Dr. Sharon Collinge talked to the students about the links between food production and the environment. A lot of these issues fall on the consumer. When walking down the aisle in the supermarket – How do we decide what to buy and what to avoid? Most consumers don't have a choice whether to buy local organic food or mass produced crops, farmed vs. wild fish, genetically engineered foods. There is good evidence behind thinking that genuinely local agriculture will tend to be more sustainable practices. Here are some of the reasons:

- Food retains its exceptional taste and freshness
- It helps improve the local economy
- Support family farms
- It helps safeguard family health
- It protects the environment by using less resources
- www.foodroutes.org



Figure 3 Dr. Sharon Collinge

Many of the problems we face to make food production sustainable relates to transportation and the use of fossil fuels. A study in the United Kingdom produced interesting results when they measured the amounts of CO₂ that are emitted during the transportation phase. As it turns out, 48% of the emissions come from individuals going from store to home, 31% by semi-trailers, and in fact, transcontinental shipping had actually very low emissions. Most of the emissions are locally generated. The measure of environmental impact is usually referred to as food miles.

What we eat makes a bigger difference than where it is produced, with red meat being the most energy intensive agricultural practice. There are many steps that we have already taken. **Farmers Markets** in the US have grown from 1,755 in 1994 to 5,274 in 2009. Farm to school programs have also increased in the US from 2 in 1996 to over 2,000 by 2009.

How about water agriculture or aquaculture? Aquaculture is currently the fastest growing food production system. With natural populations of fish depleted worldwide aqua farmers are mass producing tilapia, Atlantic salmon and tiger shrimp among many commercial species. With heavy metal contaminants affecting wild populations, sometimes farmed fish is actually the healthy solution. Almost 90% of the Atlantic salmon produced in the US is farm raised. There are still pros and cons to this practice. Giant concentrations of fish bring parasites and microbial problems that require large amounts of antibiotics. These parasites have been found to spread to wild populations.



Figure 4 Liz Wolfert

What about urban farming practices? **Liz Wolfert**, owner of Spring Tiger Farms in Denver, CO turned a two car garage into a profitable food farm that sells its produce at local farmers markets. With help from a farmers program and a good business plan, Liz invested \$1,400 in her very small urban farm that produces organic tomatoes, carrots, melons and herbs. Urban farming had its own challenges for space and good soil. In her

area there was a well known history of lead contamination in the soil. Gentrification had made her community predominantly low income African Americans. It was a challenge to get them to buy local, traceable, organic food which had to be sold at reasonable prices.

When we go into a community with a mission, even if you know it will improve the quality of life for its residents, it may still cause mixed feelings. People need to be given the opportunity to do for themselves and reap the benefits. With only 36 growing seasons before we reach 2050, we need to educate our communities to produce some of their own food to eat fresh and healthy.

FIELD TRIP 1: TOUR DE FARM

Presented by John Slutzky (Owner of La Luna Dairy) and Dr. Noa Roman-Muñoz (Veterinarian and faculty at CSU)

With all the wealth of knowledge that had been provided in the morning, students boarded a bus that took them to La Luna Dairy, a just outside of Fort Collins that is home to 1300 head of cattle. We were greeted by dairy farm owner, **Mr. John Slutzky**. We were also joined by CSU undergraduate ambassadors from the School of Agriculture that served as student guides for our visit.

John talked to the students about the history of the farm and his background. He opened the farm with his wife as a business venture in the 70's and it has since grown a lot. He milks around 1,200 cows twice a day and each cow can produce as much as 100 gallons of milk a day. Some of the problems that he faces are diseases, drought, and the high cost of feed and limited amount of land. The farm runs 24 hours a day and John considers his employees his family, they get good pay and benefits. Having a family business at this scale is a lot of hard work and long hours. John loves what he does and wouldn't change it for anything.



Figure 5 Dr. Noa Roman-Muñoz and Mr. John Slutzky



Figure 6. SEEDS leaders on board the bus to La Luna Dairy

Next, the group took a tour of the farm with veterinarians **Dr. Noa Roman-Muñiz** and **Dr. Craig McConnell** both faculty members at Colorado State University School of Veterinary Medicine. We split the group up into two smaller groups and toured the entire farm in different directions. Students had the opportunity to ask them questions about their careers and goals as well as how the farm works and how animals are treated. The tour went through all the steps towards the production of milk and the environmental impacts of this process.



Figure 7. Cows feed on carefully balanced nutritional diets

We toured the grounds to see the feed lots, understand the strict schedules for milking twice a day, and see the calves and the “maternity” pen with dozens of cows giving birth every week. There is a pen for sick cows that are being treated for infections and other illnesses. The farm is required by law to have a waste lagoon to hold manure and other animal waste from going to surrounding ecosystems. No energy is produced from the waste at La Luna Dairy, but it is picked up and used as fertilizer for surrounding food farms.

In the interior of the building, cows are lined up and hooked into a vacuum system that milks the cows. The milk goes through tubes that measure the volume of milk produced by each cow. The milk then travels to cooling towers that preserve its freshness until it is picked up twice a day by semi-trailers and taken to a processing plant that will pasteurize it for human consumption or sell it for other purposes. This process only gives a dairy cow has an average life span of 2-3 years. The entire afternoon gave our group a glimpse in the challenges and hurdles of modern milk production.



Figure 8. Students see how cows are hooked up to a system of tubes in the milking process

MOVIE NIGHT: MORE THAN HONEY

Facilitated by Michelle Nelson (SEEDS Alumni and a masters student at North Carolina A&T State University)

After a long day of workshops and the dairy tour student settled back down at the John Wesley Powell Center for dinner and a movie. SEEDS staff had chosen *More than Honey* a 2012 documentary about the worldwide decline of bee populations and modern bee farming practices. The importance of pollinators is well known and the film explores the ins and outs of these amazing creatures and their importance to humans for food production. It follows the phenomenon of bee decline across the globe from California to Switzerland and China to Australia. The film explores the outcomes and the possible explanation of the massive bee extinction worldwide.

After the film, we had a guided discussion led by **Michelle Nelson** (SEEDS Alumna) about the impact that this issue might have and the research that needs to be conducted to find the explanation for this problem.



Figure 9 Michelle Nelson

What food production challenges are we currently facing worldwide? How will we be able to feed 9 billion by 2050? How can ecology help shape the future of food production?

WORKSHOP 3: FOOD EQUALITY AND FOOD JUSTICE

Presented by Ashley Colpaart (PhD student at Colorado State University) and Michelle Nelson (SEEDS Alumni and a masters student at North Carolina A&T State University)

What is food justice? This discussion was led by **Ashley Colpaart** who is a registered dietician and an expert in Sustainable Food Systems and the Environment. The term food justice is defined as a world where everyone has always enough to eat. There are many food injustices from farm to fork and there are a lot of social impacts in the food production system. There are many movements worldwide where communities are exercising their right to grow, sell and eat healthy foods. Food should be fresh, affordable, culturally appropriate, locally grown and looking after the wellbeing of the land, the workers and the animals. Strong local food systems, self reliant communities and healthy environments are the key to a sustainable future.

Strong local food systems, self reliant communities and healthy environments are the key to a sustainable future.

Worldwide there are 2.8 billion people that live on less than \$2 a day. Over a billion people lack access to clean water. The UN reports that 825 million humans are undernourished, there needs to be a fair distribution of food. Many of these families depend on agriculture for work, but see no benefit from that food. How can we stop this if these families don't have a voice?

The US counts for less than 5% of the world population, but it consumes 25% of the fossil fuel resources, while 65% of the US population is overweight or obese. This causes a

loss of 300k lives a year and 117 billion in health costs for the US alone. Eating healthy is better for every nation. There are many organizations involved in the production of food and each benefit differently from this chain. There are producers (farmers), processors, transporters, preparers, retailers and finally consumers.

What are some of the environmental injustices that we are facing? Unfortunately this answer is very complicated and there are many answers to this question. Here are a few issues that the environment is facing:

- Water pollution
- Air pollution
- Soil depletion and erosion
- Increased CO2 emissions
- Habitat loss and extinction
- Dependency on fossil fuels
- Antibiotic and pesticide resistance
- Brownfield sites



Figure 10
Ashley Colpaart

Each of these issues has serious implications in moving towards a sustainable future. What causes food insecurity? There are many causes to this problem as well; no or under employment, education, housing, area of residence (gentrification), social exclusion, food deserts and food swamps (areas that

have no or limited access to fresh local food), income and even social support from the government. There are huge issues with access to food!

What about food system workers? There are 3 million migrant and seasonal farmworkers in the US. Of these 35% don't speak English, earn between \$12500 and \$15000 a year, have no health insurance, no job security, low wages, and work under a lot of health risks from machinery and chemicals used. Agriculture is referred to as a 3D job – dirty, damaging and dangerous. Over 100 workers die and over 300 thousand are injured every year... just in the poultry industry!

Michelle Nelson, who is a SEEDS Alumna and graduating with a masters degree in Agricultural Education in May, started her discussion with a TedTalk video related to the subject of food justice. Titled [*Protecting our Potential, LaDonna Redmond*](#) talks about her life as a long-time community activist who successfully worked to get Chicago Public Schools to evaluate junk food, launched urban agriculture projects, started a community grocery store and worked on federal farm policies to expand access to healthy food in low-income communities. In 2012, 15% of the US population was food insecure and 6% have very low food security. There are 15.9 million children that live in food insecure households and 16.1 million that live in poverty. Out of those, 25% come from black households and 26% are Hispanic.

In inner city low income areas, there is no access to fresh food, this is then linked to health issues and it can even be linked to crime. Redmond tells us that you can die from a gun or from an unhealthy diet. With no car or supermarkets within a mile there are 23.5 million Americans that live in a food desert and even 2.3 million that live in rural food deserts where there isn't access to food within 10 miles! In order for these problems to be resolved there needs to be a change in social behavior, with more people reclaiming kitchens and stoves and less junk food in these areas. The government needs to set guidelines and rules for equal food distribution in areas with crumbling infrastructure. Many companies are taking it upon themselves to change this before government steps in. Retailers are reaching out to local food coops and non-profit organizations to give away. There are many movements that are trying to change this with urban farming growing and schools educating children on where their food comes from. Little by little, change is being made.

WORKSHOP 4: ENGAGING OUR COMMUNITIES – CALL TO ACTION!

Presented by Dr. Robin Reid (Director of the Center for Collaborative Conservation at Colorado State University)

Any place on earth is an actual environment with people in it. **Robin Reid** came to talk to the group about engaging communities using her expertise in International work through the International Livestock Research Institute. Since 1992, she has been working in Africa with the local Maasai who are facing some serious challenges from industrialization cutting across traditional wildebeest and zebra wildlife corridors.

She noted that we need to move away from an imperialistic model of science where scientists often take local knowledge for their own research questions rather than allowing the community to shape the research. In effect, this is stealing from the local community. That practice is morally and ethically wrong. As scientists we need to provide the community with the tools to transform science into social action. Robin then invited students to share their own experience with engaging communities.



Figure 11 Dr. Robin Reid

There are many practices that can help the interaction between science and community. It has to come from the heart by having partnerships and co-learning programs. There needs to be face time between the two, you need to walk in their shoes and see what the community needs and how it wants to be treated. Keep your plan open and ready to evolve as the needs change. You need to actively listen and seek out other options and learn how to use your strengths.

You also need to have situational awareness during each step of the process. Learn the history and the culture of the community. What had been done before? What is the problem? What are the needs? What resources do you have? All of these steps are very important. You can also identify the leaders within the community. Leadership is the act of mobilizing others who struggle for shared aspirations and you need to help them achieve their goals. As a leader, you need to give them credit and establish clear goals to accomplish, be open to grab opportunities. Start small and build to large, don't overpromise and don't try to do it alone – every step of the way the community needs to be involved.

Leadership is the act of mobilizing others who struggle for shared aspirations

Students then formed four breakout groups. Each group came up with a few ideas to engage the community. Here are some of the tips:

- Engage the children and the community leaders
- Find the correct time and place to engage them
- Always bring food!
- Identify the problems in the area
- Not everyone will have the same issue
- Come together in a collaborative environment
- Set and manage realistic goals
- Show a real strong commitment

CAREER PANEL

Facilitated by Teresa Mourad (ESA) with panelists: Michelle Nelson, Dr. Jill Baron, Dr. Sara Oyler-McCance (USGS), Aaron Peña (PhD student at Colorado State University) and Fred Abbott (ESA)



Figure 12 Teresa Mourad

Students came together for a unique opportunity to ask professionals in the science and education fields about their career paths and professional decisions. Each panelist said a little bit about themselves and then it was open for questions. Students quickly realized the different career paths that each panelist had chosen and started to inquire about their own lives. There are many ways to succeed in life. In sciences there are many areas to explore and answers to find. The traditional academic career path is not always an option and these days there are many career opportunities besides academia.

Students asked about the importance of striving for a PhD vs. a Masters degree. Panelists pointed out that a PhD degree is a must for those interested

in research. For others, a Masters degree may well be adequate. Panelists remarked that the only “correct” path is the one that makes you happy. Students were encouraged to think about a career that will bring them satisfaction and to remember that they have the power to change careers.

JOURNAL WRITING AND DOWN TIME

Students were given the opportunity to relax and do some journal writing to reflect on what they have heard and experienced. They were then treated to a few hours of downtime in Fort Collins where they checked out some local shops and enjoyed the beautiful weather that Colorado had to offer us.

EVENING RECEPTION FOR ESA MEMBERS AND PARTNERS

At the Lory Student Center in Colorado State University

At this event, students, a few ESA members from the area, partners and CSU faculty joined the SEEDS program for a wonderful catered reception to celebrate the program. Teresa Mourad talked about the impact of SEEDS and Dr. Jill Baron spoke about the Ecological Society of America and Colorado State University. Dr. Nancy Irlbeck joined us again to talk about the College of Agricultural Science at CSU and all the wonderful opportunities it offers for graduate school. We also had our local SEEDS Chapter at CSU say a few words about their goals and accomplishments on campus and Anna Ortega (SEEDS Fellow) shared her experience in the program and the opportunities that it has provided. The rest of the evening was enjoyed with personal conversations and small group discussions all of them relating to ecology.



Figure 13 Evening reception meal



Figure 14 Evening Reception with CSU faculty

Day 4: Saturday, April 12

SEEDS UNDERGRADUATE RESEARCH FELLOWSHIP PRESENTATIONS

Presented by Dianne Quiroz (University of California, Berkley), Anna Ortega (Fort Lewis College) and Yashira Cruz (University of Puerto Rico, Humacao)



Figure 15 Dianne Quiroz

Each of the three SEEDS Fellows gave short power point presentations about their fellowship research projects and their experiences with the fellowship program. Dianne talked about her summer in Montana trapping snow shoe heirs. Anna spoke about her research at Rocky Mountain Biological Laboratory collecting nectar from flowering plants and looking at the drought effects on two local communities of plants. Yashira gave us a presentation about her work in the Florida golf coast with beach restoration projects and the effects on local ghost crab populations.

GREETING FROM DR. HENRY GHOLZ, NATIONAL SCIENCE FOUNDATION

Finally, we were joined by **Dr. Henry Gholz** from the National Science Foundation, who highlighted programs such as the NSF Graduate Fellowships, the Long Term Ecological Research sites, and the opportunities that are emerging in Big Data like the National Ecological Observatory Network (NEON). He also emphasized the importance of a well-rounded education.

WORKSHOP 5: DEVELOPING LEADERSHIP SKILLS – WHAT TYPE OF LEADER ARE YOU?

This workshop was led by SEEDS program staff and was intended to help students reflect on their own personality traits and leadership style. We administered the brief Myers-Briggs Preference Questionnaire, which classifies personality traits into 16 distinct personality types. This workshop helped students focus for the breakout group discussion and to identify their strengths and weaknesses as a leader. We focused on the idea that everyone can contribute in a leading role by tapping into their areas of strength and work in leadership teams with people of complementary strengths.

After the exercise, students were asked to respond to an Ecology Leadership Plan. The plan is a series of questions that are very personal and designed to help students think about the outcomes of their careers. With questions about strengths, value and vision, it helps students develop a personal mission statement and a slogan that they can remind themselves that even though they might struggle, the

result is worth it! We ask students to set short and long term personal goals and map out what they need to accomplish to achieve each step.

BREAKOUT GROUPS

In the afternoon, students were divided into four breakout groups, three of which pertained to aspects of ecology. The fourth was intentionally kept open in case students preferred to talk about something different. Students were allowed to choose the group that wished to be part of: Urban, Aquatic, Land Management and “Other”. Each breakout group was tasked with generating ideas on the theme of the meeting that had relevance to the breakout group focus. We gave each of the four groups four questions to think about:

- What are the issues that we are facing and who are currently working on them?
- How does ecology as a science play a role? (research topics)
- What can SEEDS Chapters and students do? (project ideas)
- What can ESA, as a society, do? (program ideas)

Group 1: Urban

Led by: Michelle Nelson. Students: Raven Daniels, Nicolas Correa, Shanice Triplett, Nicole Ortega, Carla Lopez and Mitchell Hinton

The Urban breakout group was very interested in the very limited access that urban residents have to local produce. These urban areas have a high percentage of food deserts (limited access to fresh produce) and food swamps (food that is available is mostly junk food). The group made several recommendations:

a) Policy

- Provide tax incentives for urban residents to compost, and convert lawns to gardens. The group recognizes that an economic incentive can help persuade people since most people are not motivated by ecological issues and perspectives.

b) Marketing

- Develop a catchy slogan, and conduct a before and after comparative study and long term impact
- Use research results as a marketing tool, cost benefit analysis: how does this save you money in the long run?

c) What can ESA do?

- ESA Graduate student Mentors and ESA Community Mentors on Agroecology and Urban Ecology sections can provide assistance to communities and students on the ecological issues.
- ESA members could develop and tailor their research around agriculture to assist in developing crops that are more ecologically sound.



Figure 16 Breakout Group 1: Urban

- ESA could organize a program for agriculture and ecology majors to travel internationally to address agricultural problems overseas, take a survey of the communities and offer community service.

d) Project Idea: *From Roots to Canopy*

The idea is to convert underutilized space in urban areas to urban farms for the local production of fresh, healthy food.

- Inform: determine problem, create awareness and distribute information.
- Engage: through social networking, offering educational workshops and lots of facetime with the community.
- Plan: Identify spaces, do site assessments, and evaluate policy, material acquisition, inclusive blueprinting and organize a community council.
- Implement: take action! Involve the community through more educational workshops and research projects.
- Maintain and Use: Community events, care, education and organize food distribution.
- Outreach: Expand educational program and use marketing to keep it growing.

Group 2: Aquatic

Led by: Dr. Jill Baron. Students: Yashira Cruz, Wendy Harmon, Daniel Metz, Sarah Lujan, Julissa Hunte, Ebony Jones and Taylar Harvey.

Soon the planet will have 9 billion people. In order to feed all the mouths they need access to clean, safe water to drink, cook and clean. This is an ambitious goal with many local, national and global concerns and challenges to address. The mission would be to engage communities on a national and local level to raise awareness of the concerns of food and water insecurity and injustice through ecological and social perspectives. To tackle this issue the group would use the six W's as an education tool: Who, What, When, Where, Why and Water!

- What?
What can we do to protect, preserve and better our access to food and water? Raise Awareness! They propose a national initiative to celebrate food and water to develop connections between communities and their local watersheds and food sources.
- Why?
Why should we be concerned? Our entire existence depends on water! In order to create a future in which all individuals are food and water secure we need to work together. Not just scientist and politicians will be needed to make it happen. We need everyone working together as a community to accomplish this goal.
- Who?
Who does water impact? Everybody! Every day, everyone relies on water for drinking, hygiene, and growing, washing, and cooking food. With this initiative they plan to focus on the future by targeting peers and youth.



Figure 17 Breakout Group 2: Aquatic

- Where?
Where do we act? This is a global issue that requires local solutions. Every watershed and food system has a unique issue relative to different communities. Identifying these and educating communities on how to protect their watershed and food system will be a crucial component to moving forward to secure food and water to the global population.
- When?
When do we act? The time is now! We need solutions, we need action, we need strong communities and we need good advocacy!

How can we accomplish all of this? Here is a list of what we could do:

- SEEDS Chapters:
 1. Campus Outreach
 2. Community Outreach
 3. Regional Outreach
- SEEDS Program:
 1. Bulleting information
 2. Funding
 3. Networking
 4. Facilitate conversations
 5. Provide space and time
 6. Communication and organization
- Ecological Society of America:
 1. Funding
 2. Marketing
 3. Exposure
 4. Professional Education

Group 3: Land Management

Led by: Fred Abbott. Students: Armando Mireles, Mayra Rodriguez, Marina Rodriguez, Anna Ortega, Micheal Peñuelas, Anita Arenas and Ashley Anton.

With an extra two billion people to feed in the near future – how can we produce more food without damaging even more protected land? Real estate is limited and not all of it is good for food production. This puts a huge strain on protected environments that feel the effects of agriculture in current production standards.

With 40% of the produce in the United States going to waste every year, the simple solution would be to reduce that waste. We learned that regulations such as expiration dates confuse consumers and prohibit retailers from selling food products to consumers even though they may be safe to consume. After all the resources and energy that was put into the production of food, to have food go to waste because of antiquated government regulations is ridiculous. Many of these regulations need to be re-written and consumers need to be educated about



Figure 18 Breakout Group 3: Land Management

the consumption of these food products. We need to work with large and small retailers to educate the consumer of the waste that they generate by picking and choosing the prettiest and brightest produce, while the stained and 'ugly' but perfectly edible produce goes to waste.

Reducing waste alone will not solve this problem. We need to improve our land management practices by reforesting riparian corridors and utilizing as much of the land as possible. Many public lands in the US are kept un-utilized and are not managed in any way. We propose a change to that tactic and encourage state and federal agencies to lease these out to local businesses and farmers to improve the economy and produce better quality food. But none of these ideas would work without the help of the local community. It is extremely important to get the community to recognize the need for these changes that will ultimately improve their quality of life.

Group 4: The "Other" Group

Led by: Teresa Mourad. Students: Carlos Calleja, Derek Kannenberg, Maite Martin, Dianne Quiroz and Wendy Villavicencio.

This group was formed to capture the free flow of ideas without any constraints. The group summarized the salient issues we confront related to food security and food justice:

- **System Failure.** While Sell By dates on food products were intended to protect consumers, it has also resulted in a massive waste of food as consumers perceive Sell By dates as "expiration" dates for food safety. As a result of such laws, the foods cannot be sold after the "expiration" date or consumers simply throw the food away.
- **Demand for Land.** With a growing population and economic development, there is a greater demand for land for agriculture, living space and industrial space. More land is being converted for these uses which means a loss of ecosystem services.
- **Demand for energy related to food production.** The production of biofuels such as corn for ethanol, may use land, water and energy resources that could be used for the production of food.
- **GMO vs Non-GMO crops.** While there is no data that indicates that GMO crops are detrimental to human health in the short-term and there are benefits such as yield increase and insect resistance, the cultivation of GMOs may have other unforeseen consequences such as cross-pollination contaminating wild populations, possible long-term health effects and Ethical concerns.

The group also discussed the development of Eco-villages as a promising way forward. Eco-Villages are "intentional communities whose goal is to become more socially, economically, and ecologically sustainable" (Wikipedia). These communities incorporate green technologies and seek to provide for their own local food needs.

Project Ideas

Celebrate National / International Food Events: World Food Day (October 16), US Food Day (October 24).

- Organize a day centered around raising awareness of hunger, and fighting it with proactive solutions such as green cooking classes and food demonstrations as proposed by the Urban Group.

- Distribute food educational literature at supermarkets related to the myths and misconceptions on food expiration, food production issues in general, the projected growth of the human population and how these are connected to them.
- Suggested resource: Ted Labuza – University of Minnesota

Past World Food Day themes:

2012- Agricultural Cooperatives: Key to Feeding the Future

2011- Food Prices- From crisis to stability

2010- United Against Hunger

2009- Achieving Food Security in Times of Crisis

The Green Revolution created a unique period in human history. Suddenly, those with access to modern technology no longer worried about hunger. In fact, to many people, food became one of the smallest concerns because of availability. The next few decades saw a dramatic increase in overall food consumption, but also in individual consumption. Obesity has become almost an epidemic in the United States, and waste is completely out of control.



Figure 19 Breakout Group 4: Other

There is no one answer when it comes to food security. Changes in society have created an environment that is not conducive to sustainability- no matter what your endpoint is. The practices of the day do not properly sustain our land for commercial uses, they do not promote good human health, and they demand the development of natural land into commercialized resources. In order to begin moving the future towards a sustainable system focused upon food security, a drastic revision in food culture is needed.

In order to change the culture, we have to begin with education. Much of the waste comes from citizens of the developed world who have no fear of food insecurity. Once we educate them on the problems, and how today's practices are exacerbating them, it will be easier to implement large scale change. Large events like *World Food Day* are excellent instigations, but in order to maintain a cultural change, there must always be something to attract the attention. We hope to use the "Superman 3" approach. By creating many small opportunities to increase knowledge about food security, we can bring issues of food sustainability to the forefront of the public consciousness.

Appendix A List of Meeting Participants

Ashley	Nicole	Anton	San Jose State University
Anita		Arenas	Cerritos College
Carlos	Daniel	Calleja	McPherson College
Nicolas		Correa Pascuas	University of Puerto Rico - Río Piedras
Yashira	Ayari	Cruz	University of Puerto Rico - Humacao
Raven	Lamone'	Daniels	Norfolk State University
Wendy	Allison	Harmon	Gardner-Webb University
Taylor		Harvey-Fonvil	Livingstone College
Mitchell	G	Hinton	Tulane University
Julissa		Hunte	Spelman College
Ebony	Nicole	Jones	Livingstone College
Derek	Paul	Kannenberg	South Dakota State University
Carla	de Lourdes	Lopez	University of Puerto Rico, Rio Piedras
Sarah		Lujan	University of New Mexico
Maite		Martin	University of Texas at El Paso
Daniel	C	Metz	Radford College
Armando		Mireles	Chicago State University
Anna	Caroline	Ortega	Fort Lewis College
Nicole		Ortega	Northern Arizona University
Michael	Martin	Penuelas	Stanford University
Dianne		Quiroz	University of California, Berkeley
Mayra	Ivelisse	Rodriguez	University of Puerto Rico - Bayamón
Marina		Rodriguez	Colorado State University
Shanice	Jenee'	Triplett	Dillard University
Wendy		Villavicencio	Florida International University
Michelle		Nelson	North Carolina A&T University (SEEDS alum)

Appendix B Meeting Agenda

Food Security and Food Justice: Sustaining Agricultural Abundance and Healthy Communities

**SEEDS Leadership Meeting
April 9-13, 2014
Agenda**



Wednesday, April 9

6:00 PM	Arrivals	
6:30	Welcome Dinner – Hotel	
7:30	Introductions, Welcome and Meeting Overview. Introduction to journal writing and breakout groups	SEEDS Staff

Thursday, April 10

7:30 AM	Breakfast and 8:00am – Walk to Powell Center	
8:30 am	Introductions by Jill Baron	
8:45 AM	<p>Workshop 1: Food Security and the Challenges of Food Production and Distribution</p> <ul style="list-style-type: none"> • Feeding 9 billion people • Current types of global agriculture and livestock production • Challenges to food production – where do they come from and why? • What are the effects on the environment? Aquatic, Land Management and Urban examples. 	<ul style="list-style-type: none"> • Raj Khosla – Colorado State University Soil and Crop Sciences. • Nancy Irlbeck – Colorado State University, School of Agricultural Sciences and owner of ANIROONZ Sheep Co.
10:15 AM	Break	
10:30 AM	<p>Workshop 2: Moving towards to a sustainable future</p> <ul style="list-style-type: none"> • Key links between food production and the environment • Fisheries management and aquaculture • The Locavore movement • Urban farming and planning, examples of your home town. • What is necessary to promote urban farming's longevity as an industry? 	<ul style="list-style-type: none"> • Sharon Collinge – University of Colorado and ESA VP for Public Affairs • Liz Wolfert – Owner of Spring Tiger Farms
11:50 AM	Lunch on the Go!	

12:00PM	<p>Field Trip: Tour de Farm</p> <ul style="list-style-type: none"> • A tour of a local dairy farm with emphasis on ecology implications. • Tour with La Luna veterinarian 	<ul style="list-style-type: none"> • Jon Slutsky – Owner of La Luna Dairy • Dr. Noa Roman-Muñiz – Veterinarian
4:30	Return to Powell Center	
5:00	Discussion on the day Breakout Groups / Journal writing	
6:30	Dinner and a Movie (More than Honey) Discussion on Movie	
8:30	Walk back to the Hotel	
Friday, April 11		
7:30 AM	Breakfast and 8:00AM – Walk to the Powel Center	
8:30	<p>Workshop 3: Food Equality & Food Justice</p> <ul style="list-style-type: none"> • What is food justice? • Food injustice from farm to fork • Food insecurity in the US • Innovations in the food justice movement 	<ul style="list-style-type: none"> • Ashley Colpaart – Colorado State University, Food System and Policy Consultant • Michelle Nelson – SEEDS Alum and M.S. in Agricultural Education
10:00	Break	
10:15	<p>Workshop 4: Engaging our Communities – Call to Action</p> <ul style="list-style-type: none"> • Case studies and practical strategies for education, informing policy and community-based food projects 	<ul style="list-style-type: none"> • Robin Reid - Colorado State University, Director, Center for Collaborative Conservation
12:00 PM	Lunch	
1:00	<p>Career Panel Discussion on career options and pathways Possible panelists:</p>	<ul style="list-style-type: none"> • Michelle Nelson (SEEDS Alum) • Liz Goehring (NEON, Inc.) • Jill Baron (USGS and ESA) • Sara Oyler-McCance (USGS) • Aaron Piña (CSU)
2:30	Break	
3:00	Journal Writing	SEEDS Staff

4:30	Free Time – Tour of Downtown Fort Collins	
7:00	Evening Reception with ESA Members in the area	Colorado State University
9:00	Walk back to Hotel	
Saturday, April 12		
7:00 AM	Breakfast and 7:30AM walk to The Institute for Learning and Teaching (TILT) Room 105	
8:00	SEEDS Undergraduate Research Fellowship Presentations	Yashira Cruz, Dianne Quiroz and Anna Ortega
9:15	Talk by Henry Gholz (National Science Foundation)	
9:30	Break	
9:45	Breakout Groups / Writing an Article – discussion	
10:00	<p>Breakout Groups I</p> <ul style="list-style-type: none"> • Urban • Aquatic • Land Management • Other: _____ <p>What to think about:</p> <ul style="list-style-type: none"> • Issue: Policy/Community implications – Who is working on these issues currently (stakeholders)? • How does ecology play a role? (research topics) • What SEEDS students/chapters can do? (project ideas) • What can ESA do? (Program ideas, how to coordinate?) 	
12:00 PM	Lunch	
1:00	Workshop 5: Developing leadership skills – What type of leader are you?	SEEDS Staff
3:00	Break	
3:15	Breakout Groups II	
5:00	Presentations	
6:00	<p>Discussion on Next Steps</p> <ul style="list-style-type: none"> • Writing and publishing an Article in the ESA Bulletin • Potential action steps from this Leadership Meeting • Developing common project ideas • Reflections on the Leadership Meeting • Evaluations 	SEEDS staff
7:00	Dinner / Celebration	
9:00	Walk back to Hotel	

Appendix C Presenter Biographies



2014 SEEDS Leadership Meeting: Presenter Biographies

Food Security and Food Justice: Sustaining Agricultural Abundance and Healthy Communities

Fort Collins, CO

April 9-13, 2014

Ashley Colpaart - My name is Ashley M. Colpaart and I am a registered dietitian nutritionists (RDNs) and Ph.D. student in Food Science and Food Safety at Colorado State University. My research is on the integration of principles of sustainable, resilient and healthy food and water systems into the dietetics profession. I have a M.S. in Food Policy and Applied Nutrition from the Friedman School of Nutrition Science and Policy at Tufts, and have extensive and practical experience in understanding the role of food in human health as it pertains to social, economic, and environmental spheres. I have worked as the Nutrition Service Coordinator for Meals on Wheels in Austin, Texas, the Farm to Institution Coordinator for Tierra Miguel Farm and Foundation in San Diego, and as a private consultant of various food system projects both in Colorado and nationally. I am currently the Chair of the Hunger and Environmental Nutrition Dietetic Practice Group of the Academy of Nutrition and Dietetics.

Jill S. Baron is an ecosystem ecologist with the U.S. Geological Survey, and a Senior Research Ecologist with the Natural Resource Ecology Laboratory at Colorado State University. She applies ecosystem concepts to management of human-dominated regions, and studies the effects of climate change and atmospheric nitrogen deposition to mountain ecosystems. She founded and Co-Directs the John Wesley Powell Center for Earth System Science Analysis and Synthesis. Baron is President of the Ecological Society of America (ESA). Baron has contributed to all National Climate Assessments, was Lead Author on Climate Change Adaptation Options for National Parks, has given testimony to Congress on western acid rain and climate change issues, and was Editor-in-Chief of *Issues in Ecology*, an ESA publication for non-scientists from 2009-2012. She has guided the Loch Vale Watershed long-term monitoring and research program in Rocky Mountain National Park since 1983.

Jon Slutsky and his wife, Susan Moore, are first generation dairy farmers and have owned and operated La Luna Dairy in Northern Colorado since 1981. Currently they milk 1300-1400 cows at their farm near Wellington. They have one adult daughter. Jon is a native of New York; however he grew up and attended school in Southern California. He graduated from the University of California-Riverside with a bachelor's degree in biology in 1972. As general manager of the dairy, Jon oversees the management of the farm including 2600 cows and calves and 26 employees. In order to add to the dairy data base and body of knowledge and assist in making good BMPs available to the industry, the farm has a policy of giving access as frequently as possible to animal and environmental researchers in the university community. The dairy tries to be a strong member of

the local business and agricultural communities. Jon represents the dairy and the industry locally as a board member of the Wellington Area Chamber of Commerce, the Larimer County Agricultural Advisory Board, and the Colorado Livestock Association. He also serves on several other committees as time permits. Jon was a member of the Colorado Air Quality Control Commission from 2007 to 2012 and is currently a member of the Colorado Water Quality Control Commission.

Liba Pejchar - I am an assistant professor in the Department of Fish, Wildlife and Conservation Biology at Colorado State University (CSU). I teach conservation biology and ecology, and I am also the faculty advisor for the new SEEDS chapter at CSU. My lab uses field ecology to develop better ways of protecting and restoring biodiversity on private lands and other human-dominated landscapes. We work primarily in Colorado and in Hawaii with birds and mammals. The lands we work on vary from large-scale forest restoration projects, novel ecosystems (which include native and non-native species), active ranchland, housing developments along the rural-urban gradient, and areas undergoing energy development. Our work generally focuses on more than just collecting and communicating biological data because seeking solutions that are ecologically, economically and socially sustainable require active collaboration across disciplines.

Liz Wolfert - Liz is the owner and manager of Spring Tiger Farms, a micro-urban farm just northeast of Denver. Started in 2013, Spring Tiger Farms is a neighborhood farming enterprise that:

- Serves the community with naturally-grown vegetables and fruits that are both familiar and exciting, with a focus on food access and preservation of heirloom and local varieties;
- Creates a viable business model for urban farming and economic productivity; and
- Participates in a new and vital network of food providers, local businesses, and community service providers.

Liz has a background in urban planning, land use, and affordable housing development. She currently also works as a financial consultant to non-profit organizations, housing authorities, governments, and other developers interested in pursuing publicly-financed capital projects.

Michelle Nelson (North Carolina A & T State University) - My name is Michelle Nelson. I am a graduating Masters of Science Candidate (Agricultural Education, Professional Service) at North Carolina Agricultural and Technical State University and a SEEDS Alum! My personal interests are Agriculture (Best Management Practices & Sustainability), STEM education, and community and school gardens. I fell into my love for Agriculture and its still developing like a huge fruit basket or thanksgiving feast, so much to discover and explore. I'm a huge advocate for Cooperative Extension and youth programming. During my spare time, I volunteer with Cove Creek Gardens and FoodCorps, both organizations that emphasize experiential learning and informal teaching. I joined SEEDS in 2010 (roughly) and my first trip was to El Yunque National Rainforest! Life changing put it on your bucket list! In the future I hope to work for USDA or for Cooperative Extension. Really excited about this conference and I hope you are too :)

Nancy Irlbeck has been the Associate Dean of Academics for the College of Agricultural Sciences at Colorado State University for over nine years. Prior to that time she was on faculty in the Department of Animal Sciences for 15 years as an animal nutritionist. In a predominantly teaching role she has been and continues to be a strong advocate for students. In her personal life, she and her husband have a flock of six rare wool breeds of sheep on the Colorado-Wyoming border. In addition to her sheep, one of her greatest joys are her six (and two coming!) grandbabies!!

Noa Roman-Muniz was born and raised in Puerto Rico. After completing a pre-veterinary program at the University of Puerto Rico – Mayaguez in 1997, she earned a Doctor in Veterinary Medicine degree from the University of Wisconsin-Madison in 2001. She has been with Colorado State University since the summer of 2001. After finishing an internship program in Food Animal Internal

Medicine and Surgery at CSU's Veterinary Teaching Hospital in 2002, she earned a M.S. degree with an emphasis in adult education in 2004 from CSU's Department of Clinical Sciences. From 2004 to 2008, as a postdoctoral fellow in the Department of Clinical Sciences, she developed and facilitated culturally-sensitive training interventions for Spanish-speaking livestock workers. During that time she also conducted herd health investigations on Colorado dairy herds. Dr. Roman-Muniz has been with the Department of Animal Sciences since August of 2008 as the new Extension Dairy Specialist. Her areas of interest are animal health and well-being, dairy worker training, labor management, and human safety and health on livestock operations.

Raj Khosla is a Professor of Precision Agriculture at Colorado State University. Dr. Khosla's main research focus has been on "Management of in-field soil and crop spatial variability in large and small scale agricultural production systems". In 2012, he was named the Jefferson Science Fellow at the U.S. National Academy of Sciences and was appointed as the Senior Science Advisor to the US Department of State. Since 2011, he is a board member to the US "Presidential Advisory Board on Positioning, Navigation and Timing" and works on US Space based GPS policy. He was recognized with CSU distinguished Monfort Professorship in 2008. He is a Fellow of American Society of Agronomy; Fellow of Soil Science Society of America; and Fellow of Soil and Water Conservation Society. Prof. Khosla is the Founder and the immediate Past President of International Society of Precision Agriculture.

Robin Reid is the founding Director of the endowed Center for Collaborative Conservation at Colorado State University and professor in the Department of Ecosystem Science and Sustainability at Colorado State University. She is also co-founder of the Colorado Conservation Exchange, a new watershed investment fund in northern Colorado. She is also joint faculty in three departments in the Warner College of Natural Resources and Senior Research Scientist at the Natural Resource Ecology Laboratory. From 1992-2007, she lived and worked in east Africa, leading research with pastoral peoples, on the social and ecological sustainability of their ecosystems. Her team of researchers and pastoralists won the 2012 Sustainability Science Award from the Ecological Society of America, for their paper describing their efforts to make science useful to local communities and policy makers. Her most recent book, *Savannas of Our Birth*, charts human origins in the savannas of Africa, and the unexpected role that pastoralists currently play in enriching savannas for the region's abundant wildlife.

Sharon Collinge (University of Colorado-Boulder) is Professor in Ecology & Evolutionary Biology and Environmental Studies, and Director of the Environmental Studies Program at the University of Colorado-Boulder. Sharon's professional expertise centers on how landscape change affects the survival and persistence of native plants and animals. Sharon's 2009 book, *Ecology of Fragmented Landscapes*, synthesizes research on the ecological consequences of habitat loss and fragmentation and reviews ways in which science can inform ecological restoration, landscape architecture and planning, and biological conservation in urban and wild landscapes. Her current research focuses on the use of ecological theory to guide efforts to conserve and restore vernal pool ecosystems in California. At CU-Boulder, Sharon has taught courses in Conservation Biology, Food and the Environment, Disease Ecology, and Restoration Ecology.

Appendix D Evaluation Report Summary of Leadership Meeting



2014 SEEDS Leadership Meeting: Presenter Biographies

Food Security and Food Justice: Sustaining Agricultural Abundance and Healthy Communities

Fort Collins, CO

April 9-13, 2014