

## **Knowing and Growing Network of Organic Women Farmers in the Caribbean**

Digital media for learning, networking and farm management

**(Suggested theme: Community Development**

Sub-theme: Community based Learning and Outreach)

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*With no explanation for climate change or the abrupt shifts in weather, farmers may think this is 'God's work' - and beyond the control of mere mortals. By extension, farmers might not consider themselves actors of consequence whose actions could have direct impacts for climate change and for our collective futures on this planet. In fact, nothing could be further from the truth!*

We have been working with farmers in the Caribbean region since 2004, developing an e-network support system of organic women farmers – first teaching them about the holistic benefits of organic farming (food and health, management of climate change, biodiversity, local production) but also teaching them technical aspects to using the Internet more broadly and social networking tools more specifically over time. In 2010, six workshops later, the network is at least 180 people strong – primarily but not exclusively, women farmers. What began as a network of farmers seeking to become organic has now extended to farmers concerned about a healthy and resilient food economy in the context of climate change and environmental stress.

A review of current research and documentation shows that there are few comprehensive materials that look at women's use of and access to ICTs in the context of farming and climate change. Our research indicates that despite the lack of dependable data on the impact of climate change on agriculture, the issue is gaining more attention as climate issues attract more urgency. At the same time, it is clear that the treatment of climate change and agriculture needs to be localized in order for it to be of any value to farmers and policy makers alike.

We will present our work, the challenges, and the particular gender dimensions of working with media and technology tools in a rural and multi-island setting – in a participatory workshop session.

### **From the ground up!**

Many of our global environmental issues are directly related to Earth's natural resource base. According to James G. Speth<sup>i</sup>, today's major global scale challenges include climate disruption, losing forests, losing land, losing freshwater, losing marine fisheries, losing biodiversity, and over-fertilization with nitrogen (leading to large areas of dead soils and ocean). All of these challenges and losses are inter-linked and inter-dependent, resulting from modern methods of land use and the relentless exploitation of resources for consumption and profit. Poverty aggravates the issue; the chopping away of coastal sea grape or mangrove swamps for coal for personal use damages the coastline's natural defense systems against the ravages of hurricane - related erosion. The long-standardized and established principles of land use methods need to be 'unlearned' and reversed, the vested interests of an entrenched agro-industrial system<sup>ii</sup> and its system of subsidies dismantled, and by the same token, those people who could be the natural stewards of land and natural resources need to be recognized, valued and empowered to take new strides in the context of climate change.

Three fundamental assumptions inform the premise of this paper:

1. Field research shows that small-holders in general and women farmers in particular are generally left out of emerging discussions and decisions around farming, food security and climate change. This needs to be redressed.
2. Comparative research has proven that compared to non-organic farming systems, organic farming methods positively address a range of factors related to climate change. Organic farming, however, is not mentioned in the Intergovernmental Panel on Climate Change (IPCC) 2007 report and continues to be isolated from mainstream agricultural discourse. This also needs to be redressed.
3. Interactions and communications with farmers, small holder farmers and women farmers prove that they are a critical part of the solution to contain greenhouse gas (GHG) emissions. They are not mere receivers of information or instruction but are valuable record keepers, watchful data collectors, and on-the-ground pulse takers of the impact of climate change on the biosphere. This needs to be recognized and supported.

### **Information and security go hand in hand**

Now, more than ever, there is a direct correlation between security of livelihood and holistic information. Those who are marginalized from information or who have incomplete information are disengaged from forming decisions about their long term security. The confluence of rural poverty and environmental degradation are well documented - but the reverse is also true - environmental degradation and poverty become more widespread often because documentation and information is lacking. "Security" now means not just food security and livelihood security, but also the security of sustained natural resource resilience, of the predictability of information, of the provision for those in need in the community (such as the frail and elderly) and of financial insurance to cover times of need and recovery.

In traditional small holder society, crop diversity was not an accident of history or geography, but a product of management and stewardship of particular cultures and communities. Many First Nation groups across North America for instance, grew a combination of corn, beans and squash (referred to as the 'three sisters') whose converging properties took care of both soil and crop. Farmers need to be able to build upon these traditional agricultural systems relying on historical information and their farm 'memory' of risks and trials while adopting new practices based on scientific data and our current understanding of the climate system. In other words, the evidence of climate change needs to be made a part of farmers' future planning scenarios and realities, and needs to be expressed in terms familiar to them.

When knowledge and resources are easily available, farmers will choose to conserve those assets that sustain their livelihoods. Based on our field experience, it is clear that women are not only keen to get information, they are swift to apply what they learn and are pragmatists when it comes to securing assets, natural resources, capital and markets for the livelihoods of their communities. At the same time, women farmers who are looking to improve their livelihood security also often face:

- Incomplete information and poor access to data and intelligence;
- Limited recourse to regulations or legal instruments that support their interests;
- Limited access to services including credit, computer access, land tenure;

- Limited access to insurance or disaster relief benefits; and
- Limited negotiating power as a result of the above.

With the diffusion of wireless into rural areas in the region, information communication technologies (ICTs) could provide an important set of tools for addressing information gaps because they have the potential to allow women to be part of the communication value chain and to break through information bottlenecks. In the digital age, sources of information should no longer be ‘top-down’ nor single-sourced. They are multidimensional and multi-sourced which is why it is especially dangerous when myths, misperceptions or incomplete information abound. In discussions at NID training workshops,<sup>iii</sup> Caribbean women noted how they use their cell phones to pass along daily psalms to their family and friends; in times of crisis or emergency it is likely that similar methods of transmitting messages and warnings would take place.

ICTs are and will continue to be an integral part of any climate change management plan. In general, there are three main aspects of communication that ICTs can be used for:

- **Localized information:** *Time sensitive, dynamic and multiplied* localized information is the bedrock to planning for and managing climate change. Farmers depend on daily weather reports or the Farmer’s Almanac to forecast weather, now that farm security is increasingly linked to the ability to forecast or anticipate climate change, dependable, localized and current information is needed. The micro-climatic nature of Caribbean weather means that information needs to be drawn from a range of sources for it to be valid and useful to farmers.
- **Data collection, record keeping and transparency:** *Verification, benchmarking and measuring* agricultural, natural resource and climatic data requires a solid commitment by scientists, farmers and analysts alike to share information and data. This means a continual flow of information – a feedback loop – from ground up to satellite and back down. The old system of extension service from the urban to the rural is no longer valid. At the same time, government legislation needs to be updated to conserve forests and farmlands alike and to respond to the needs of land management in the context of climate change. There is, furthermore, a clear link between organic farming and its record-keeping, transparency and data collection aspects - organic farmers are already acclimated to this type of process and required to do so. They therefore are very likely to be in the vanguard of localized data collection such as weather data collection systems
- **Networking, cooperation and advocacy:** *distribution and engagement* of information among farmers, within communities, across islands and countries will strengthen the regions’ resilience and capacity to handle the crises that we can expect with climate change. Local media, community radio and phone use are increasingly important as new ways of sharing and learning about these momentous shifts. Radio is a 21<sup>st</sup> century media solution as it couples up with other technologies such as Global System for Mobile Communications (GSM) phones and Short Messaging Service (SMS) technology. A radio and text messaging mash-up allows any villager with a cell phone to respond to what they hear on relevant community issues broadcast over radio in low literacy/limited Internet environments.

All facets and aspects of the above, from the very local cell phone call to the Global Positioning System (GPS) – are much simplified and made possibly by the range of potential ICTs at our disposal.

### **Women’s farm roles: Traditional and emerging**

Through the Knowing and Growing<sup>iv</sup> network, we find that women farmer entrepreneurs are typically involved in more than one enterprise, often combining their farm activities with other related enterprise to

make ends meet. The two profiles from Belize and Guyana demonstrate a spectrum of age, activity and ICT experience, as examples of the kinds of farmers working in the region (see Annex).

If organic farmers in the Caribbean are to be active players in the global trend towards organic farming, then it is essential that they have access to the Internet, and that they begin to use ICT based applications for their information management and communication needs. ICTs afford relatively inexpensive access to a wealth of information and networks, market information; comparative data on farm gate prices; consumer analyses, as well as organic methods. The latter include not only producing organic products but also ensuring that the products are stored, processed, handled, labelled and marketed accordingly. In addition, information management software affords easier record keeping and by extension, more efficient means of forecasting supply and demand for products and produce.

To help women take advantage of computerization and digitization in the context of existing and emerging organic and natural products markets, there is an urgent need to build on current initiatives. Existing nodes of activity need to be developed into a strong interactive marketing network. This requires training in basic ICT skills, e-marketing skills, website management, vision building, and exposure to ICT service providers, marketing organizations and regulations and standards bodies. One of the main concerns of new entrants into the organic market is the small consumer base and the lack of market premium. An effective way of creating and maintaining these markets would be to put buyers in direct contact with growers, and this is where information technology and connectivity are a key medium exchange.

In the context of climate change, women need to find those individuals within government bodies and institutions who understand and champion small holder farm interests. These institutions often function at a policy making level, not at the grass roots level and do not involve or engage farmers. This includes those responsible for solid waste management, national security forces, national water commission, forestry, meteorological office, climate risk insurance bodies, tourism, aqua and fisheries development, coastal lands management and environmental legislature. In other words, the policy context, while still evolving, needs the strong and vocal advocacy from and for women farmers.

## Farmers and ICT appropriation survey results: Interpreting the findings

### Climate change evidence

The 23 farmers who participated in NID's June 2009 survey (survey questionnaire reproduced in Annex 1) provided tangible examples of the impact of climate change not only on their farms, but also in their communities. Increased flooding, wind damage and soil erosion have left small farmers struggling. Examples of issues facing farmers are:

- Heavy rains followed by severe droughts;
- Flooding on roads and damage to infrastructure;
- Shade trees damaged by Hurricane Iris which adversely impacted cacao production for more than 5 years;
- The usual rain cycles have changed and weather patterns are shifting. We are in rain shadow much of July and August save for hurricanes;
- Annual flooding and landslides in areas not prone to flooding;
- Need to evacuate the farm several times in recent years;

<b>Awareness of government measures, programs on climate change</b>		%
Aware of a program/strategy		57%
Unaware of programs		43%
<b>Management of climate change issues</b>		%
Actively managing		62%
N/A		5%
Not doing anything yet		33%

- Cost of transportation to and from the farm increases as roads are washed away and the farm becomes highly inaccessible;
- Increased wind stripes leaves off the coffee trees, causing berries to fall, resulting in lower production levels;
- Increased costs incurred from repairs to farm and buildings; and
- Changes in insect's behaviour.

The unpredictability of seasons and increasing economic costs are the two biggest issues facing these farmers. While over half of those surveyed were aware of a program their local or national government had adapted in order to prepare for climate change, over 80% were not involved. It is evident the small farmer is not being engaged in any affirmative action to adapt to or manage climate change.

### Farmer use of ICTs

- 76% use a cell phone daily compared to 43% who use landlines daily;
- 62% use a computer with internet connectivity on a daily basis, however only 13% use a social network or blog and no one had used e-conference facilities; and
- 62% use the TV and radio either daily or weekly.

ICTs used / frequency	Daily	Weekly	Monthly	Rarely	Never
Cell phones	76%	14%			10%
Satellite phone				10%	90%
Land line	43%	19%		24%	
Computer without internet	29%	10%		19%	14%
Computer with internet	62%	29%			0%
Video, film, DVD	29%	33%	5%	14%	10%
TV or radio	52%	10%		19%	
E conferences	0%	14%	5%	33%	24%
Blog/social networking	19%	19%	5%		24%

Effective dissemination of information on how to manage and address climate change will greatly aid farmers in their daily activities. Text updates with weather warnings could be invaluable tools. For those who are regularly connected, blogs and social networks provide innovative ways to share information on mitigating the effects of climate change. Radio is a cost effective method of spreading information quickly.

The top three measures farmers requested in order to cope with climate change are education and public awareness; ICT tools to share knowledge; and access to weather data as well as instruments to collect data.

### Need for further research and information

**Information paucity:** The rural poor face narrow choices of information and low perceptions of the value of indigenous knowledge. The negative impacts this poverty of information has for health, for agriculture and livestock farming systems, for harvesting and marketing, for environmental resource management etc. put the typical rural poor person at a distinct information disadvantage in the emerging knowledge economy;

**Dependence on environmental income:** Rural poor derive a significant portion of their total income on ecosystem goods and services (forests, grasslands, lakes and marine waters provide resources such as building materials, fuel, fish, medicinal plants) as well as from small-scale agriculture. Due to this dependence on environmental income, the poor are especially vulnerable to eco-system degradation, and

to the physical disasters brought on by climate change such as hurricanes, droughts, erosion, and/or flooding;

**Feminization of poverty:** Poverty, food insecurity, and environmental degradation have a disproportionately negative impact on rural women, due to their inferior socio-economic, legal and political status as well as their critical roles as producers and household managers. The causes and effects of these impacts are systemic, with far-reaching implications for agricultural and rural development as a whole and for all initiatives aimed at raising levels of nutrition, improving production and distribution of food and agricultural products, and enhancing the living conditions of rural populations;

**Lack of disaster resilience:** Requires local knowledge, expertise, and resources to build further disaster resilience and capacity at the local level. Lack of interests representation, whether through intermediary agencies, local government bodies, farmers associations; micro credit institutions; capacity building organizations, the rural poor lack a voice in determining or negotiating their strategic needs. The World Bank's "Voices of the Poor" report stated that if there is one thing that differentiates poor people from rich people, it is their lack of voice and the lack of opportunity to be represented. Access to information is thus not a luxury, it is not an extra. It is absolutely at the core of equitable development.

### **An urgent need for capacity building**

**Priority Area I - Climate Change Literacy: farmers can only do something about climate change if they understand what it is.**

The development of local audio-visual training tools specifically for farmers and public campaign materials for the general population, go hand-in-hand with the sensitization and briefing required for policy makers and champions of a robust and viable food economy in the region. We have found that taking laptops and short videos into the farm has an immediate and positive impact on farm learning.

Climate change literacy will require sustained and comprehensive activities in:

- Basic climate change literacy, awareness and understanding of global and local climate change issues among farmers and consumers;
- Further development of digital networking and electronic access to climate-change information and networks;
- Inspiration and affirmation from what farmers have been able to do to mitigate and adapt to climate change and what can be done locally in the Caribbean, women's voices need to be promoted too;
- A range of technical knowhow encompassing permaculture, organic farming and 'beyond organic' needs to be made readily available to counter mainstream agro-industry (such as easily available GMOs, fertilizers and pesticides);
- An awareness of issues that farmers do not often get to hear about, such as access to information about on farm and processing energy use and options; maximising carbon sequestration on farm and minimising carbon emissions; trends in biofuel production; practical actions to collect weather data; and future plans for climate risk insurance and reduction in the region;
- Understanding their farming roles in reducing carbon emissions and the farm's role in carbon sequestration;
- Understanding the key aspects of water systems management for the farm and beyond;
- Understanding linkages with forestry departments and possible partnerships there. A systemic shift away from current single-species monoculture model<sup>1</sup> (whether in crops, livestock, aquaculture or forestry) towards a more integrated closed-cycle polyculture system; and
- Beginnings of an understanding of traditional means of farm protection in hurricanes.

Warschauer<sup>v</sup> proposes that a better model for understanding access to ICTs is provided by the concept of literacy. The world has considerable experience in literacy acquisition that can also be brought to bear on ICT for development. Referring to the work of Brazilian social activist and educator Paulo Freire, Warschauer argues that “literacy instruction is most effective when it involves content that speaks to the needs and social conditions of the learners. As with ICT-related material, this content is often best developed by the learners themselves”. This has a particular resonance with women, who are usually intimately knowledgeable about their local contexts, issues and solutions, and can use ICTs to share, consolidate and represent their interests and perspectives. They will also benefit by accessing information that can provide them with the information to better serve themselves, their families, and their communities.

#### Priority Area II - Policy briefings for policy makers in the Caribbean - stepping away from conventional agriculture and making organic the default solution

- Development of a policy brief on organic farming and climate change for policy makers in preparation for Copenhagen Conference on Climate Change in December 2009;
- Lobbying key policy makers in the Caribbean region in the lead-up to the next Climate Change Conference for the inclusion of agriculture (particularly organic) onto the agenda;
- Formulating policy recommendations and tabling them with the UNFCCC Secretariat and selected member delegations, COSs, and informal and formal groupings (G8, G5 and G77/China etc).

## Annex I: Copy of survey questionnaire

Information and Communication Technology (ICT) tools and services for Organic Farmers in the Caribbean : A Climate Change Survey

Please return this survey to: [Shannon@networkedintelligence.com](mailto:Shannon@networkedintelligence.com)

Thank you for taking the time to participate in our study. This survey will help us to assess the information needs of organic farmers in the context of climate change in the Caribbean region with a particular focus on tools and services offered by ICTs (Information and Communication Technologies).

### Who Should Participate

Small-scale farmers; individuals who manage land or who are involved with farmers in the Caribbean region; including activists, retail and service providers, government officials and academics.

### How It Works

This survey has three parts. We would appreciate responses to all three parts. The three parts of this survey can be done in any order. As a survey participant, your contact details will be retained for future invitations to related training workshops but will not be published without your permission.

The three parts of the survey are:

- **Climate change** – on the impact that climate change has had or will have on your farming activities, plans and decisions;
- **Information and communication tools** – on your access to timely and relevant information and ability to reach others before, during and after climatic disasters;
- **Organic Farming** – on how organic farming might help you to prepare for and manage climate change.

### Where the results will go

The survey results will help NID and local partners to better understand and address the needs of farmers in the region. This study is being supported by the IDRC Canada and the survey results will be made available on line for public use.

**PERSONAL DATA** (This information will not be published without your permission)

Full name & email:
Business / organization name & mailing address:



Responsibilities or main activities:
Number of immediate household members whom you support:
Age range of family members:
Your age:

**PART I: CLIMATE CHANGE**

1. What does the term Climate Change mean to you?

2. What changes have you seen on your farm or around your community that are a result of climate change?

	Not at all	Few times a year	Ongoing challenge
Flooding or water-related changes			
Hurricane or wind damage			
Soil erosion or land degradation			
Destruction of crops or buildings			
Unpredictably of seasons			
Economic costs (such as price increases)			
Other (explain)			

3. Do you know of any measure, program or strategy that your local or national government has adapted in order to prepare for climate change?
4. Have you been involved in local meetings to address climate change issues? If yes describe how.
5. How have you managed the effects of climate change in your farm or around your community up to now?
6. What are the top three measures or services you need to help cope with climate change?

**PART II: INFORMATION AND CONNECTIVITY**

7. Please tick all those which apply to indicate your current use of:

	Every Day	Weekly	Monthly	Rarely	Never
Cell phone					

Satellite phone					
Land line phone					
Computer (without Internet)					
Computer (with Internet)					
Video, film or DVD					
Television or community radio					
E-conferences or on-line debates					
Blogging & social networking					

**8. What are your main sources of information on climate change and local weather warnings?**

**9. What would make your access to information more effective, efficient or timely?**

**10. Are there special issues/concerns of particular interest to you in regards to climate change? (As a woman, are there issues that are different from men?)**

**11. Have you come across materials or information (on-line or off-line) that are especially useful to women farmers in the region? If so, describe them.**

**12. What materials or information (on-line or off-line) would be especially useful to you in order to better prepare for climate change, but you have difficulty finding?**

**13. How did you find out about this survey? (tick all that apply)**

<input type="checkbox"/> Communication from the Knowing & Growing Network
<input type="checkbox"/> Direct email from NID
<input type="checkbox"/> Through a membership organization (state which)
<input type="checkbox"/> Through a government Ministry (state which ministry)
<input type="checkbox"/> Other means (explain)

### **PART III: ORGANIC FARMING AND CLIMATE CHANGE**

**14. What is your involvement with or links to organic farming?**

**15. What is your level of knowledge of organic agriculture? (Tick all that apply and year)**

	2008/2009	2005 - 2008	1995 - 2005
<b>I want to shift to organic methods</b>			

<b>I practice organic methods on a farm</b>			
<b>I have attended organic training courses</b>			
<b>I am an organic farm inspector</b>			
<b>I work a certified organic farm</b>			
<b>Other - please explain</b>			

**16. What crops do you grow, what animals do you rear. Which crops or animals would you like to grow or rear in the future?**

**17. At the moment how do you get your information about farming methods, markets, prices and other business networks?**

**18. Do you think there could be a link between organic farming and climate change? Explain why.**

THANK YOU FOR TAKING THE TIME TO COMPLETE THIS SURVEY.

## Annex II: Selected farmer profiles

### Farmer Profile: Rodlyn Semple from Guyana

**Rodlyn Semple** is 30 years old and supports 4 household members (ranging in age from 7-52 years). Her family resides in the city (on the coast), which is 6' below sea level. The weather conditions are generally wet and dry, averaging 32 degrees Celsius. Rodlyn accounts that recently, due to climatic changes, Guyana has seen irregular rain and weather patterns, and is more susceptible to floods. Since the last major flood destroyed numerous homes, crops, livestock, and lives, the government now advises that all planting should be built to a standard height above ground to account for flooding.

Rodlyn has access to farmland and maintains a 10x20' shade house that has been constructed with wood and plastic. The house is covered by a shade net with six 3x14' boxes (4' off the ground). She currently grows lettuce, calaloo, pakchoi, and celery. Rodlyn explains that farming in an urban area brings extra challenges because of the dense population. Another pen is only 15' away from her shade house, where they rear 200 birds every 6 weeks, for example. She is in the process of purchasing her own land and intends to extend the size of her operation.

She manages the shade house alone, which requires daily watering and general agronomic activities like checking for weeds. Rodlyn is also employed full-time as a Technical Officer with the Standards Bureau in quality management systems. Additionally, she is the President of the Guyana Forum for Youth in Agriculture (GFYA). As President, Rodlyn's role includes agriculture advocacy and assisting young people to establish agricultural activities, such as training through the Ministries or the International Institute for Cooperation on Agriculture. Rodlyn also develops and implements an annual work program under the areas of entrepreneurship, agricultural awareness, fundraising, and collaboration with key agricultural agencies throughout the country.

*Education and ICT Training:* Rodlyn is a trained agriculturist with a Bachelors of Science in Agriculture from the University of Guyana (2001). She has also participated in two ICT trainings (Knowing and Growing, Grenada 2006; Mona Campus University of West Indies 2008) as well as computer training as part of her degree and through her employment as a Market Research Officer (in Internet and Market Information Systems) directly after graduation.

*ICT Use and Access:* Rodlyn uses a computer and cell phone (for calls and text messages) daily. She also has daily internet access at work and uses the computer for employment activities, related to both her roles as Technical Officer and GFYA President. Rodlyn owns a personal computer that she also uses almost daily, but does not (yet) have access to the internet. Despite submitting an application 3 years ago, Rodlyn has continued to encounter issues with the local telecommunication company. She can access the internet on her cell phone, if needed, for a charge. She uses television, community radio, and video/film/DVD on a daily basis as well. Rodlyn started her own blog but has not added new information for quite sometime. She also engages with other social networking tools such as Facebook, Hi Five, and Guyana Palace.

*ICTs and Climate Change:* Rodlyn finds the internet, television, and community radio important and helpful in adapting or mitigating the impacts of climate change. The major challenges she experiences in accessing these tools are cost and accessibility.

*Women's Role and Traditional Knowledge:* Rodlyn explains that ICTs help to put her in an advantageous position with having first hand knowledge of significant issues. She is also better equipped to guide others in making better decisions for their own agricultural activities. Rodlyn asserts that the most important agricultural knowledge for effective adaptation to climate change includes knowing both the technical and practical aspects in different subject areas such as soil sciences, crop husbandry, and soil and water management.

### **Farmer Profile: Verna Samuels from Belize**

**Verna Samuels** is 57 years old and she supports 1 household member. There are 3 additional people in her family (ranging in age from 21 to 30). Verna owns and manages a lodge in Belize. The lodge is situated in the heart of the Crooked Tree Sanctuary, a top birding site in Belize and maintains over 250 resident or migratory exotic neotropical birds. The lodge also has guided tours, camping sites and now has 18 rooms (up from the original 5 rooms).

Verna built the business from scratch in 1993. In the low-season, Verna also makes homemade jams and jellies to sell in the gift shop. She is always looking to grow her business and to improve upon what she is already doing. Additionally, Verna maintains a farm where she grows vegetables and fruit organically, including hot/sweet peppers, okras, spinach, callaloo, thyme, melon, squash and fruit trees.

*Climate Change Adaptation:* Verna encounters significant ongoing challenges, due to climatic changes including flooding or water-related change, hurricane or wind damage, soil erosion or land degradation, price increases and the unpredictability of seasons. A few times a year, she also experiences destruction of crops or buildings and finds that there are more pests than usual.

She has made some changes with her farm to manage the effects of climate change such as planning short term crops and using trees that live in flooded areas. Verna has additionally moved some plants to higher ground. She accounts that the top three measures she needs to cope with climate change are: (1) a water system; (2) a resource person or centre where you can access local information; and (3) access to small loans or grants.

*ICT Use and Access:* Verna uses a cell phone, land line phone, computer (with internet), television or radio and video/film/DVD every day. She rarely uses blogging or social networking tools and has never used an e-conference or online debate.

*ICTs and Climate Change:* Verna finds that information from the television is most useful for information on climate change and local weather warnings. She also uses some information from the national radio station. Verna asserts that her access to information would be more effective if she could access it when she needs it, and sometimes even before she needs the information so that she can plan properly, especially because Belize is prone to flooding.

Verna explains that certain materials would be especially useful in helping her to prepare for climate change such as: (1) information on how to keep ants away from plants; (2) an Almanac that tells you what month is good for planting specific plants; and (3) information on her soil type and recommendations for most suitable crops.

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## ENDNOTES

<sup>i</sup> James Gustave Speth, March 2009 **The Bridge at the Edge of the World**: Capitalism, the Environment, and Crossing from Crisis to Sustainability

<sup>ii</sup> What makes our food system really unsustainable is the predominance of the globalised commodity trade that has resulted in the integration of the food supply chain and its concentration in the hands of a few transnational corporations. This in turn has greatly increased the carbon footprint and energy intensity of food production and consumption.

<sup>iii</sup> NID workshops details

<sup>iv</sup> The Knowing and Growing network is a small but growing virtual network of women farmers based in the Caribbean who have participated in at least one of the NID ICTs and Organic Farming workshops. The members keep in touch via email and some are members of the Knowing and Growing Facebook group. The network was first established in 2004.

<sup>v</sup> Mark Warschauer, 2002, Reconceptualizing the Digital Divide  
[http://www.firstmonday.dk/issues/issue7\\_7/warschauer/](http://www.firstmonday.dk/issues/issue7_7/warschauer/) accessed June 29th 2008