

APP Thematic Feature No. 6

Intra-ACP Agriculture Policy Programme (APP) Caribbean Action, with funding by the European Union under the 10th European Development Fund (EDF)



Intra-ACP APP Caribbean Action

Traditional Knowledge Transfer and Modern Innovation Will Go a Long Way in Building Resilient, Small Farming Systems in the Caribbean

Some old time farmers insist that planting in accordance with the phases of the moon results in bigger, tastier crops. That may be true. However, farming isn't what it used to be. Things have changed.

The crippling weight of competition from imports requires that farmers produce more crops per acre than ever before in order to be competitive. Producing more crops usually means needing more water, using more agro-chemicals and for some crops, using modified varieties designed for higher yields or resisting pests.



Traditional field and innovative shade house farming in Saint Lucia.
(Photo: Canbean Associates Inc.)

Water use for agriculture is already an area of growing concern which has been exacerbated by the significant impact that climate change has wrought through rainfall variability and altered seasons. The increased use of pesticides to tackle the usual pests, as well as new pests associated with climate change, is also a concern and an issue that has been flagged by policy

Are Farmers Still Planting by the Moon?

makers. Increased chemical use is also a serious trade matter, linked to high residues and negative impacts on human health, as well as health and safety for farmers who handle the agrochemicals.

Clearly, practices have changed, they had to. But have they changed for the good?

"It is clear that a lot of the practices that we see now in small holder agriculture were not there ten to twenty years ago", says Dr. Lyle Barbara Graham. Dr. Graham was tasked with converting information gathered in baseline surveys carried out by the Caribbean Agricultural Research and Development Institute (CARDI) into a report on farmer traditional knowledge and innovative farming practices from around the Region. The report was commissioned under the Component 2 of the Intra-ACP Agriculture Policy Programme (APP) funded by the European Union (EU) under the 10th European Development Fund (EDF).

The CARDI baseline surveys and the Graham report have reconfirmed previous conclusions about the current state of Caribbean agriculture, such as the fact that there is:

1. Limited on-farm research results with respect to climate adaptability of crops that are of strategic interest to the region,
2. Insufficient access to and use of appropriate farm machinery in general for small farming systems ,
3. Inadequate documentation and information dissemination on protected agriculture experiences and research results and;
4. Restricted production of wholesome local-based value-added agricultural products for local consumption and acceptance on foreign markets.

Validating traditional knowledge and the application of innovation into the industry dominated by small farms in the Caribbean must be an important part of farming systems solutions. "Understanding traditional (farming) practices is meant to allow us to see what farmers are doing so that we can understand appropriate improvements", says Dr. Graham. Not only that, but these practices may be useful for sharing, amalgamating, publishing and streamlining. "We can improve the transfer of knowledge from farmer to farmer and within institutions for the purpose of increasing levels of production, hence addressing food security and poverty issues, as well as creating more environmentally friendly practices", she says.

This feature highlights the value of both traditional (longstanding) and innovative methods of farming in the Caribbean, as well as the benefit of understanding current practices and systems to support a more resilient farm sector. It identifies what can be considered 'traditional knowledge' in current farming systems and practices, advances in technology and innovation that are available and being adopted by farmers, and gaps that need to be filled to meet present and future environmental, social and economic realities for food production in the Region.



Growing cassava in Guyana (Photo: Canbean Associates Inc.)

Where Do We Begin? Clarifying 'Traditional Knowledge'

Farming in the Caribbean boasts a wide variety of longstanding and innovative practices. These practices vary from country to country and are often passed from generation to generation or neighbour to neighbour in the farming community. There is immense value to be had in understanding the role that these practices played in sustaining the farm sector across decades and how these have evolved over time.

In addition to the importance of sharing of these practices with a wider audience in order to benefit agriculture across the Region, establishing a baseline of how farmers currently operate will contribute to strategies aimed at transforming the multitude of small farmers in the Caribbean into sustainable and resilient enterprises. With a baseline established, NGOs, governments, farming organizations and farmers themselves will be better equipped to make strategic decisions on the use of existing knowledge and the gradual integration of the appropriate innovative technologies and practices.

"Traditional farming systems may be considered a living body of agricultural knowledge passed on from generation to generation. It includes know-how and skills in food production practices that have been developed and sustained over decades. Its living nature also means that it is dynamic and innovative, yet resilient."

Source: "Towards Traditional Knowledge Transfer for Resilient Small Farming Systems in the Caribbean", Dr. Lyle, Barbara Graham, 2016

The place to begin is a proper understanding of the definition of Traditional Knowledge. This concept is often misunderstood and needs to be defined before it can be investigated and catalogued. According to Dr. Graham in her report to the APP, "Towards Traditional Knowledge Transfer for Resilient Small Farming Systems in the Caribbean", traditional knowledge in agriculture refers to the "knowledge, innovation and practices of indigenous people and local communities, "maintained, developed and passed on, through centuries from generation to generation." It is important to note the reference to the concept of "innovative" in the definition. Contrary to common thought, the word traditional does not mean "old" or "out-dated". In the context of continuous learning and improvements, 'traditional' practices need to be interpreted to describe ways in which local farmers have modified their 'longstanding' ways of doing things that allow them to adjust to new realities through innovation. This innovation can either be 'home-grown' or adapted from other parts of the world.

The report acknowledges that the wider development community has long understood and appreciated the value of traditional knowledge. It has been considered a critical resource base by organizations such as the Consultative Group on International Agricultural Research (CGIAR) and the Centre for Indigenous Knowledge for Agriculture and

Rural Development (CIKARD), both of whom have used it as the platform for the development and design of sustainable agricultural systems.

The APP implementing partners have also recognized the value of traditional knowledge and its proper documentation and validation in the Caribbean. This is why one of the first activities undertaken under Component 2 was the 2014/2015 baseline survey on farmer traditional knowledge and innovative practices, which set the stage for the preparation of the Graham report. Information was collected from seasoned farmers, including women, young farmers and small-scale agro-processors in 15 participating CARIFORUM countries. The surveys gathered production and bio data, and information on the use of new technologies, climate change adaptation capacity and other practices that are being applied on farms across the Caribbean.

Where Are We Now? Examining Current Approaches & Challenges

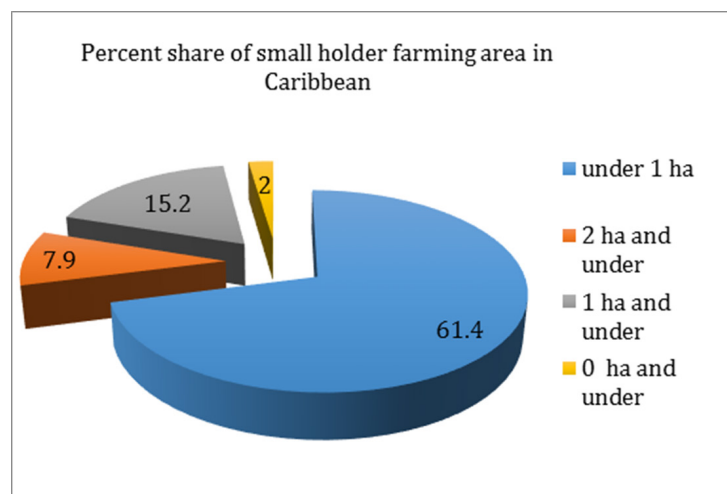
The land that the Caribbean has to offer for farming, in terms of quality, is not going to change. However, the environment, technology, increasing populations and food demand, and competition from outside sources have already brought changes and will continue to drive change in farming and food production systems in the Region. Land for farming is being lost to houses, highways and hotels in most countries, and a changing climate is making open field farming conditions more and more challenging.

Farm Sizes are Still Small and Small Farmers Still Dominate

For many decades, the Caribbean agricultural industry has been dominated by the small farmer. Described in Dr. Graham's report as being risk averse due to the fact that agriculture was often the sole source of income for a family, they had limited use of chemicals to combat pests and weeds and limited use of veterinary assistance for livestock. 'Traditional' complaints from small farmers have been of water shortages, increased incidences of pests and diseases, limited access to land and credit, weak access to markets and inadequate technical advice due to limited availability of extension personnel. For years, many small farmers have relied heavily on informal meetings with other farmers and the annual 187 year old MacDonald's almanac to guide many of their farming decisions.

Not a whole lot has changed in terms of the size of farms and quality of farmland. The farming base is still dominated by small sized and fragmented farms operating

on lands with compromised soil fertility or on hillside terrain. This makes small farmers vulnerable to risks from the vagaries of the weather and natural hazards, including heavy or no rains and high winds. Many farmers are also still struggling with limited access to water and reliance on rain, as well as under-developed systems for irrigation. To top it all off, adherence to good agricultural practices requires small farmers to upgrade basic practices and on-farm sanitary facilities, which also depend on access to adequate water. Farmers have no choice, but to adjust their farming systems, operations and practices to either work around or adjust to these challenges.



Source: "Towards Traditional Knowledge Transfer for Resilient Small Farming Systems in the Caribbean, Dr. Lyle Barbara Graham, 2016.

Traditional Knowledge and Practices are 'Innovating'

Today, farmers cope with these common conditions using practices based on traditional knowledge. For example, to address the challenges of hillside planting they use grass barriers and plant on contours to control soil loss and water runoff. They use mulch and compost to improve soil structure, and they use runoff from fields stored in man-made basins as a source of much needed water during the dry season.

Some specific ways of adjusting are also illustrated in the practices used for growing cassava and sweet potato. Traditionally, not much fertilizer was used on these crops, however practices today show that farmers are using different types of fertilizers and herbicides to enhance soil and battle weeds. They are also taking a non-fertilizer approach by applying compost and mulch to manage their fields. Intercropping, fallowing, crop rotation and vetiver grass are also being used to improve soil conditions and create barriers against soil loss and erosion.

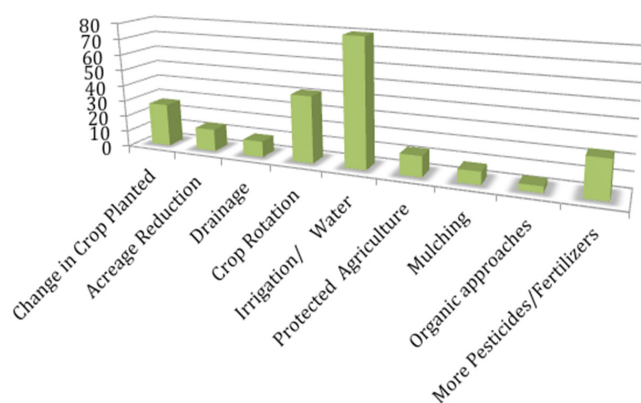
For hot pepper production, innovations, new-technology and improved weather-related practices have also been added to the traditional knowledge base. Protected agriculture is now seen as a viable and good practice for growing this commodity. Seeds are still planted directly in the ground however, shade houses can be used to protect vulnerable plantlets. Other adjustments that small farmers have made which have improved the productivity of traditional practices, is the spraying of crops in the evening to avoid chemical burn from high day-time temperatures.

Farmers Going Beyond Just Coping to 'Adapting'

It seems that high temperatures are the new reality, along with the many other effects of climate change in the Region. It is no longer disputed that climate change is becoming the largest determinant of agricultural practices. The Graham report cites significant impacts on water availability, a change in planting seasons due to a shift in rainy peaks and different diseases and pests all due to a change in climate. These factors affect land use and traditional methods of land preparation, the choice and application of chemicals and ultimately the capacity to meet the requirements for trading these commodities in both traditional and emerging markets.

"We need to understand how climate change is benefitting or influencing traditional practices", Dr. Graham says. "We need to get a better feel for what is happening in terms of how farmers are responding and adapting to climate change in order to allow them to maintain production levels, but ensure that what is being done is safe for the soil and environment, and for people's health."

Number of crop farmers making changes due to changing weather



And to be sure, they are adapting. As noted by Dr. Graham, "traditional practices in farming systems are being impacted by ...climate smart practices, though ad hoc". These coping mechanisms are evolving into new

and improved practices that are becoming an integral part of the innovative traditional knowledge that drives small, local and indigenous farming systems.

Survey results show that among the crop farmers interviewed, the greatest area of coping has been in relation to preserving water for agriculture. This result is fully expected and understandable for without water, whether rain fed or through irrigation, there is no farming. After water, rotating crops and an associated increase in the use of agro-chemicals, are the next best means of adjusting to changing weather.

Interestingly, the number of farmers resorting to protected agriculture (PA), as well as organic farming, was relatively low, though these are significant elements being supported by regional development. This may be associated, in part, to the types of crops which formed part of the survey. For example, roots and tubers are a common crop in the Caribbean and generally, they are grown in open fields using conventional farming practices.

At-a-Glance: Traditional-Knowledge and Innovative Practices Across the Caribbean

The end goal of investigating and cataloguing traditional knowledge and innovative practices across the Caribbean was to gain a better understanding of what is happening in regional agriculture in order to foster sustainable improvements in productivity and resilient farming applicable to: cassava, sweet potato, corn, rice, hot peppers and vegetable, and the health and productivity of small ruminants. In her report, Dr. Graham selected several main priorities based on the CARDI survey results, further analysis and supporting research. This section provides an at-a-glance overview of the options for improvements in good practices in the noted priority areas.

Water Management

Traditional Knowledge: According to the Graham report, "Water harvesting for use on the farm for crops and livestock has been used traditionally through the centuries, dating back 4000 years or more. The practices involved the clearing of hillsides from vegetation to increase runoff."

Innovative Practices: Rainfall Collection Efficiencies (RCE) will be dependent on the catchment surface of the area (bare soil, concrete, rooftop) used to collect water, the conveyance system for the collected water (gutter, tube, etc.), the storage capacity of the

Design Rainfall for rainwater harvesting for agriculture is defined as the total amount of annual rainfall received by the farm at which or above which the catchment area will provide sufficient rainwater runoff for harvesting and storage to supplement crop water requirements. This rainfall amount is based on series data of 30- 50 years and is available for all the countries. Of note, the catchment is not the watershed but the localized area impacting the farm.

Source: Towards Traditional Knowledge Transfer for Resilient Small Farming Systems in the Caribbean, Dr. Lyle Barbara Graham, 2016.

collection unit and fittings for distribution of the water (eg. irrigation techniques), and knowledge of rainfall patterns, as well as the design rainfall for the site. Many advances have been made in each of these areas to increase the RCE potential. Specific details, including design specifications, can be found in the Graham report.

Roof top harvesting:

- Storage in plastic, cement or ferro cement tanks
- Allows for water supply during the dry season or droughts for crops, forages and livestock

Soil surface runoff:

- Storage in dams, natural ponds and rivers, or soil storage including bunds or pits
- Allows for water supply during the dry season or droughts for crops, forages and livestock

A **Bund** is a small barrier to runoff designed to slow down water flow and the ground and encourage filtration into the soil to improve soil moisture.

Community harvesting:

- Farmers on contiguous plots of land can share the cost and construction of catchment or runoff systems, along with the storage tanks to be used by the immediate community.

Check Dams:

- The dams can be built by a community of farmers to ensure that the farmer at the very end of the farming area still has access to water for his operations

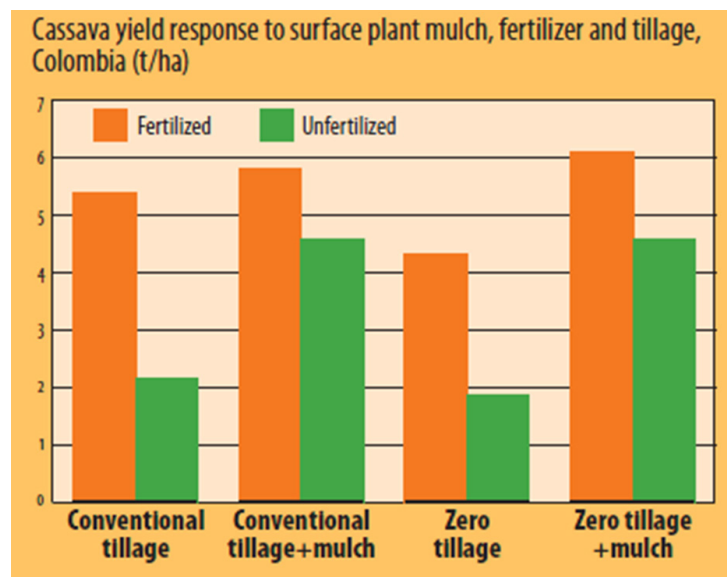
- Farmers would need to agree on an arrangement for distribution lines, maintenance and watering times.
- An excellent example is the Cades Dam Irrigation System which serves eleven vegetable farmers on the island of Nevis. Details can be found in the Graham report.

Given the importance of providing a long-term solution for water for agriculture, and the competing demands of industry and domestic uses for water, some governments have included considerations for public infrastructure for rainwater harvesting. However, this too must be coordinated at policy level to manage conflicts that already exist for this increasingly scarce water, which is a resource for some and a commodity for others, but for farming, an absolute necessity.

Soil Management

Traditional Knowledge: According to the APP Baseline survey, many farmers are increasing their use of chemical fertilizers and herbicides for higher yields, better control of pests and diseases in crops, and to combat the leaching of fertilizers into soil. However, higher chemical use leads to a reduction of microbial life in the soil which over time reduces the ability of the soil to generate its own organic matter.

The Graham report acknowledges that excellent traditional knowledge and practices exist that can create organic matter in the soil, such as, the application of green plant material often mixed with eggshells, coffee grinds, banana peels and more. This “results in the ultimate return of soluble organic nutrients to the soil for use by plants for growth, and creates a soil structure that holds more water in the profile.”



Benefits of mulch in conventional and conservation farming. (Source: Save and Grow Cassava, FAO)

Innovative Practices: Mulch and compost are sustainable alternatives to chemical fertilizers that have been used by Caribbean farmers for some time. However, recent research provides new information on improvements to these practices using new natural materials and processes. Mulch will eventually breakdown and become compost.

Compost consists of decomposed plant or animal organic material that is applied in solid or liquid form. In its solid form, compost looks like soil with some moisture. It is incorporated into the soil when the beds are being prepared and interacts with soil micro-organisms to release minerals, carbon and nitrogen to increase soil fertility and enhance plant growth. Mulching and composting both improve the nutrient quality of the soil and its capacity to absorb and retain water.

The benefits of Mulch on:

- **Soil water content:** Water is both trapped in the mulch and held in the soil for use during low rainfall or drought, allowing for continued crop growth when there is no access to irrigation
- **Soil fertility:** Contributes to organic matter enhancing nutrients in the soil
- **Soil protection:** Minimizes soil loss during high winds, reduces the damaging impact of heavy rainfalls, which causes erosion, and deflects direct sunlight resulting in lower soil temperatures
- **Plant growth:** Promotes germination from the moisture resulting from condensation, keeps roots much cooler and suppresses weed growth allowing for better crop establishment and nutrient uptake

If not properly managed however, mulch can introduce unwanted pests and diseases into the soil and compete with the plant for nutrients, 'stealing' important micro-organisms from the soil to assist in its decomposition, temporarily hindering plant growth. Best practice require that old or rough plant materials be applied to the soil at least two months before planting or sowing the main crop.

Specific details on mulching and compost types, as well as instructions for making compost, can be found in the Graham report.

- **Contouring:** is the practice of plowing and/or planting across a slope, following its contour lines. It has been a traditional knowledge practice for decades. Stone walls can still be seen on several old estates in the Caribbean. In modern farming systems, contouring is still a viable option to conserve rainwater by forming a water break and reducing soil loss from surface erosion.

Management of Pests and Diseases

Traditional Knowledge: Pests and diseases have been a long standing reality for farmers in the Caribbean. However, while farmers have found ways to cope, many farmers are now complaining of increased and new incidences of pests and diseases, some of which are not currently documented. There is wide spread evidence that farmers are responding by significantly increasing the use of chemical pesticides with lesser inputs of organic pesticides.

Innovative Practice: Integrated Pest Management (IPM) is guided by three types of control measures: cultural, biological and physical. The more farmers examine their plants and increase their knowledge of pests and diseases, the more effective the controls will be.

- **Cultural measures:** Creating an unfavourable environment for the pest to survive or reproduce
 - **Crop rotation:** most effective when the follow-up crop in the rotation is from a different family and not a host crop to the pest that is to be controlled
 - **Companion planting:** growing particular plants together to provide nutrients, shade, or support and/or attract beneficial insects to repel pests
 - **Flour preparation:** an inexpensive yet effective flour and soap mixture to deter aphids and spider mites, thrips, whiteflies and downy mildew

Cultural control also includes field sanitation, selection of clean cuttings, prevention of root exposure on plants grown on hillsides and keeping soil moist to prevent cracking. In addition to the highlighted practices above, the timing of plant growth stages can also be important. For example, allowing young plants time to establish to a tolerant stage before an attack occurs, or for the crop to mature before a pest becomes abundant, and to avoid the egg-laying period of a particular pest.

- **Biological measures:** Using biological control agents, or natural enemies, to naturally feed on and kill pests
 - **Bio-fumigation:** introduction of fresh bio-mass and manure into the soil which starts a biological process that releases a chemical substance, suppressing soil borne pests and diseases. Plants from the cabbage family release the largest amounts of chemicals and are considered the best material for bio-fumigation
 - **Plastic covering of bio-mass/manure pile:** prevents the escape of gasses released by bio-degradation

- **Natural plant extracts:** some plants are, Neem - commonly used with sweet potato to combat pests; Garlic -effective against a wide range of disease causing pathogens
- **Physical measures:** Creating an unfavorable environment for pest growth and/or destroying pests
 - **Solarisation:** covering of soil with plastic sheets for about 4 to 6 weeks during which heating levels can kill many disease causing organisms and pathogens
 - **Trapping and bagging:** planting of a crop on infested land so that the pest is stimulated to attack. The infected crop is either removed before the pest can complete its life cycle or the crop will not provide all the requirements necessary for the completion of the pest's life cycle

Management of Plant Varieties and Cultivars

Traditional Knowledge: Farmers across the Region are already fully aware of what works best in their fields. They are indeed the experts. The APP baseline survey found that there were many well-informed producers that were ready and willing to share information and experiences on the best cultivars for their area, including suggestions on how and where the material could be sourced and offers to provide samples of the cultivars if asked. Such 'informal' transfer of traditional knowledge and practices and 'home-grown' innovation can contribute to the ongoing efforts to validate best practices, improve productivity and lead to increased yields in a more sustainable manner.

Innovative Practice: While definitely a good start, success in sustaining yields under increasingly difficult conditions will require that farmers have ready access to adequate amounts of quality planting material and animal breeding stock. The improved material and stock must be able to withstand new environmental realities in order to produce a product that is profitable, either as a fresh or value-added product..

"How to improve agriculture? Take everything we know and make good investments."

Jethro Greene, Chief Coordinator, CaFAN, TAC, August 2016

Creating resistance to pests, disease, heat and drought is all important in this new climatic environment. Research into improved plant germplasm and efficient techniques for multiplication of plantlets will be required to create more resilient crop varieties. This will require strategic

policy direction and support, as well as a substantial increase in technical, infrastructural and institutional capacity in germplasm improvement and management across the Caribbean. For best results, validation trials should be carried out using both monoculture and mixed systems, under both open field and protected agriculture systems.

"There is sufficient evidence of the significant role that traditional knowledge can play in sustainability and resilience in small farming systems through adaptation to climate change, by simply exploiting some of the principles of traditional knowledge with which they are already familiar", says Dr. Graham in her report. Jethro Greene, the Chief Coordinator for the Caribbean Farmers Network (CaFAN), echoed Dr. Graham's comments in a simple statement at the APP Technical Advisory Committee (TAC) meeting. "How to improve agriculture", he said. "Take everything we know and make good investments."

Where Are We Heading? Contributions of the APP

The question is, 'where to invest'? CARDI, enabled under APP Component 2, has intensified its applied research in the priority areas noted in the Graham report, as well as other important areas:

Water and Soil Management: Under the joint support of the APP and Technical Centre for Agriculture and Rural Cooperation (CTA), 16 agriculture stakeholders from seven different Caribbean countries were sent to the mid-western United States to take part in an International Fertilizer Development Center (IFDC) International Training and Study Tour on Technology Advances in Agricultural Production, Water and Nutrient Management.



Study Tour participants at Isbell Farms in Cherokee, Alabama.
(Photo: P. Lucas)

The tour offered information, research and interaction with the latest technologies related to soil fertility and water management. Participants observed first-hand how these technologies can be applied to farming systems in developing and developed countries' agriculture. They were challenged to return home and share this new information through the various avenues available to them, such as educational institutes, extension services, farmers' groups and development organizations. The hope is that the knowledge sharing will lead to updated traditional practices and improved productivity and sustainability.

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CARDI is also carrying out climate-smart evaluations of sweet potato using guinea grass for mulch which promises several benefits including, increased water retention capacity in the soil and improved soil structure.

Improved Plant Varieties and Cultivars/Pests and Disease: CARDI activities under the APP have also included crop varietal research and management of improved plant varieties and cultivars. They have carried out climate smart trials to evaluate crop performance for water stress for cassava, sweet potato and corn in countries around the Region to evaluate improved local and imported varieties of these crops and their ability to withstand new climatic realities. Support has also been provided to countries to build and improve facilities that enhance research and management of improved germplasm, based on identification and acquisition of high-performing varieties that offer greater resilience to the increasing threat of pests and diseases and climatic variabilities.

CARDI has also carried out several trials to test 'green' options for combatting worms in small ruminants. Early results show promise for a natural remedy made from neem, aloe vera, moringa and garlic.

The APP-support has enabled CARDI to increase national capacity to multiply and make these improved varieties available to small farmers, including training in improved propagation and management techniques, building on the system of traditional knowledge.

Adaptation to High Temperatures: Pioneering work is also being done in the area of Green Intensive Farming Technologies (GIFTs) in the establishment of

an innovative, energy efficient 'tropical' greenhouse structure, as well as improvements to traditional protected structures such as, shade houses.

Transitioning from Manual to Mechanised Farming Systems: Appropriate and small scale machinery has been obtained under the project. This includes hand-held walk-behind tractors with automated tillers. The benefits of their use in saving on time and labour and improving land preparation are being demonstrated to small farmers.

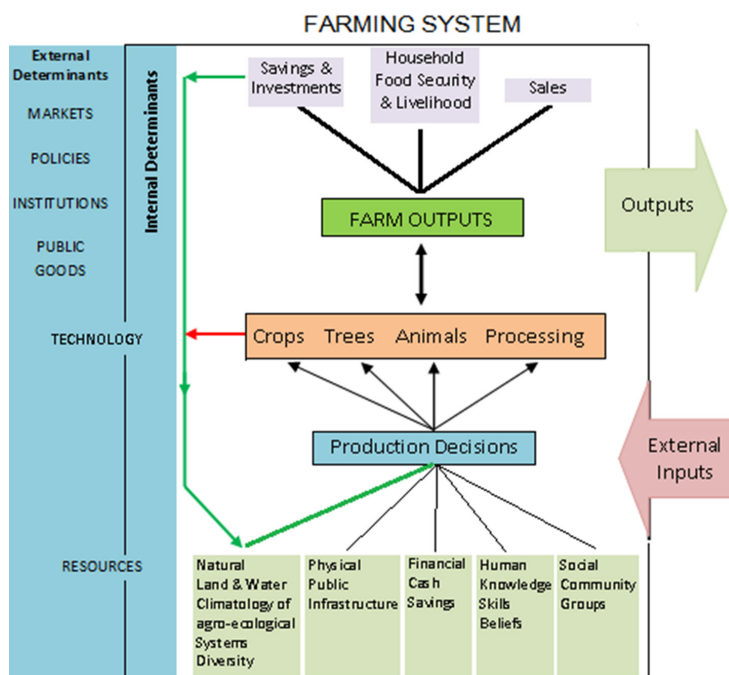
Where Do We Go From Here? Transferring Knowledge and Innovation

The APP Partners want to get the word out. Baselines have been established and catalogued. Action is underway to address gaps and update traditional knowledge with innovative practices and, once that has been done, the updated practices need to be shared.

CARDI and its APP Partners and Collaborators are currently defining the best modes of disseminating the information. This will include, but is not limited to, national and regional workshops and circulation of knowledge products in print and electronic form through national and regional producer organisations and extension services in Ministries of Agriculture and national research and development entities.

"Traditional knowledge transfer in farming is a systems approach," said Dr. Graham. "The combination of know-how and skills is intended to achieve longer-term generational objectives for agro-ecosystem functionality in sustainable food and livelihoods." She acknowledges that the mix of traditional knowledge and technologies has the potential for good practices leading to productivity and sustainability however, she is concerned about the barriers to progress in this area.

Weak financing opportunities, poor protected agriculture choices and weak technical support make the top of her list of concerns. Dr. Graham also acknowledges that the acceptance and application of new practices is not always an easy change for farmers. New practices, in the beginning, can be labour intensive, slow-going and sometimes expensive. It can often be difficult to see the benefits to natural resources and productivity in the new practice over conventional ways. Farmers also need to be persuaded that relationships with enterprises and markets, as well as commercialization, are beneficial and can be made in harmony with traditional knowledge application.



Schematic Representation of Farming Systems modified with Climate Change
Source: Adapted from FAO-PEOPLE CENTERED APPROACHES –FARMING SYSTEMS

Any “approach to traditional knowledge transfer”, Dr. Graham says, “should focus on removing some of these bottlenecks in the farmer systems.”

Removing the bottlenecks will take collaboration amongst development institutions, governments, financial and research institutions, farmers groups, agro-processors and farmers themselves. With the pressing needs of the people for food, and the economy for stability, along with the impact of a changing climate, we cannot afford delay.

Work carried out under the APP enhanced the Regional efforts and process to strengthen institutional relationships, which have historically been strained in the Caribbean. “We have achieved one basic thing that hasn’t been done for years”, said Jethro Greene at the TAC, “everyone is sitting around the table and farmers now have a voice.”

Winston Rudder, the CEO of the Agricultural Development Bank agreed. “Too much effort and energy has to be expended to dismantle siloization”, he said. “The APP is a model for those responsible for development. There is a need for this kind of institutional alignment to succeed.”

The APP has also renewed the vigour of the Agriculture Food and Nutrition Cluster, previously the Agricultural Institutional Cluster (AIC) and the Regional Planners Forum (RPF). Virtual and face-to-face meetings are now being held regularly, ensuring that Ministry of Agriculture and farmers group representatives, along with other agriculture organizations and invited members of

the private sector, gather together to align plans and priorities and discuss solutions to the challenges facing agriculture.

The Activity Integration Matrix (AIM) database, which has also been updated under the APP, will also help with this process. It has been reorganized and information on agricultural projects in the region is being acquired to create a single knowledge-sharing space to facilitate more efficient decision making and institutional collaboration for agricultural development in the Caribbean. It will include information on country strategies, multinational institutional programmes, externally-funded programmes and institutional projects.

What Else Can Be Done? Broader Integration of Traditional Knowledge in Caribbean Agriculture

Dr. Graham is passionate about Caribbean agriculture. She is respectful and appreciative of the traditional knowledge being applied in Caribbean farming today and excited about how it will look in the future. Her report takes an even deeper look into possible applications of traditional knowledge, reinforces previous calls and offers additional suggestions as to how it can be even more broadly integrated, including.

1. Continued promotion of and learning from successful Regional experiences in:
 - a. organic farming as an enterprise, with traditional knowledge approaches as the brand under which farmers will operate and work towards standards that satisfy certification of organic farms.
 - b. agro-parks, based on traditional knowledge production practices and using climate smart approaches such as solar and wind.
 - c. a landscape approach to traditional knowledge practices, especially in watersheds and in protected areas, the creation of legume parks and the promotion of permaculture as part of forest protection.
 - d. selective and interesting traditional knowledge practices for introduction into school garden programs and competitions such as, companion planting, crop rotation, tiered planting associations, integrated farming of livestock and crops, legume farms for forage using trees with attractive legume flowers. These need little maintenance and will be more suited to young people.
 - e. research on the economics of traditional knowledge application in small farming, including extension to the entire enterprise (plant-livestock associations) and not just on individual commodities.

2. The creation of incentives for agri-chemical suppliers who sell bio-pesticides and encourage standards for labeling of natural pesticides, and the promotion of research and development in plants with possible bio-pesticide properties at the level of institutions.
3. The development and implementation of a Communication Strategy to effect a participatory approach to encourage farmers to adopt best practices in farming systems based on the understanding of the principles of resilience and productivity in agro-ecosystems.

These practical options illustrate promising possibilities for the future of farming. A resilient Caribbean agriculture industry built on small farming systems, will benefit from validating and institutionalising the wealth of traditional knowledge in the Region. This knowledge should then be augmented with lessons learned, and the application of best and emerging good practices from advances and innovation within and outside of the Region, as appropriate preparation for the future.

“Resilient farming systems will also require a succession of youth capacities in farming”, says Dr. Graham. “Currently they are virtually absent so there needs to be a discussion and a plan to involve youth in resilient small farming systems.” Passing on traditional knowledge and innovative practices from one generation to the next will be a key to future success.

She also points out that the idea of good practice is not just important at the farmer level but also in the management of the programmes that change practices. “There needs to be focus from the programme level among CARDI, IICA and partners including the FAO, UWI, Ministries of Agriculture, and farmers’ organizations, on critical areas of traditional knowledge-innovative practices, and their benefits to sustainable and reliant farming systems.”

See also:

TF#5: Changing Climate, Changing Farming Systems (October 2016)

TF#7: 96° in the Shade: Cooling Things Down in Protected Agriculture Structures (November 2016)

TF#8: Farming Green: Using Natural Plant Material to Enhance Crop and Livestock Farming (November 2016)

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Intra-ACP Caribbean Action Implementing Partners

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