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Communicating hurricane preparedness for agriculture, forestry and fisheries in the Caribbean

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Hurricanes are a natural disaster that have become a fact of life in many parts of the world, including the Caribbean. Although the danger that hurricanes pose to human life is the most serious concern, they also threaten the livelihoods of people who rely on agriculture, fishing and forest resources for their livelihoods. The tropical storms and hurricanes that hit the Caribbean in the last few years have led to repeated requests for emergency assistance to strengthen national and regional capacities to cope with these potential disasters.

Fortunately, there are measures that can be taken to prepare farm families, fishers and forest communities in order to reduce the risk that hurricane damage poses to their livelihoods. In the immediate event of a hurricane, there are steps that these groups can take to protect their livestock, their food supply, their boats, and their connections to markets. In the long run, there are alternative cropping choices, land preparation techniques and other mitigation options for reducing the impact of hurricane damage on farming, fishing and forestry systems in the region.

Communicating these immediate and long-term measures effectively involves not only the transfer of information, but also the adoption of best practices. Adoption of preparedness and impact mitigation techniques requires culturally relevant and effective communication channels as well as legislative, policy and institutional support from the Ministries that serve the agriculture, forestry and fisheries sectors. Effective communication strategies for hurricane preparedness and impact mitigation should be a joint effort among communication professionals, agricultural extension staff, community development workers, disaster management agencies, the private sector, government policy initiatives and, of course, the people who have the most to gain: farm families, forest users and fishing communities.

Through the FAO supported project, "Emergency Assistance for the Formulation of National Hurricane Disaster Preparedness" (TCP/RLM/6616), agricultural communicators and extension professionals came together at a workshop in Grenada in September, 1998, to discuss communication strategies for limiting and preventing hurricane damage in these sectors. Through the workshop, they were able to share approaches and measures that have worked in their own countries and to put forth a set of recommendations that may be useful to other countries that also face the risk of hurricanes.

A communication strategy that links culturally appropriate instructional materials for the most vulnerable groups, along with greater public awareness and general disaster preparedness, was viewed as having the most chance of being successful. Strategies should include both general public education efforts along with specific instructional packages that build on the indigenous knowledge, constraints and methods which rural groups already use to control hurricane risks. Their recommendations are presented here along with a set of practical tips ready to be used by media professionals in their radio and television broadcasts.

General public attitudes and perceptions

Experiences with hurricanes vary from country to country. This means that the degree to which hurricanes are perceived as a risk also varies from place to place. The level of perceived risk varies not only among the general public, but also with respect to how the Ministry of Agriculture (MOA) in each country perceive hurricanes as a priority issue requiring committed resources and communication efforts. Any effective communication strategy for hurricane preparedness in agriculture, forestry and fisheries must be part of a larger campaign to sensitize the public in general.

All hurricane prone countries have individuals who can still recall the experience of a hurricane disaster. The indigenous knowledge about hurricanes exists. All countries can find people who remember the events of a hurricane disaster and who can give first hand "before and after" oral accounts of what happened. These individuals should be sought and interviewed for radio, TV, print and video materials as a starting point for popularizing preparedness and mitigation. This is especially important for those countries that have not experienced a hurricane for some time and might have been lulled into thinking they are immune.

It is recommended that, in order to popularize hurricane preparedness among the general public:

1. Popular music and song competitions should be promoted. Communication efforts should link "culture" with "agriculture" when communicating hurricane preparedness and mitigation. This applies to general mass media efforts to make the public more sensitive to hurricane readiness on the whole.
2. Major artists and singers should be encouraged to lend their name to promote hurricane preparedness and mitigation. These individuals should be sought and interviewed for radio, TV, print and video materials.
3. Media materials should be developed which highlight the cost of hurricanes to agricultural production as well as the costs to the countries as a whole. These should be circulated to the MOAs, agricultural, forestry and fisheries producers and mass media for educating the general public.
4. The general public should be informed of the importance of food security, especially in times of potential natural disasters. The role of farmers needs to be given higher status through the media. Communication efforts should aim at shifting people's preferences away from imported foodstuffs, especially during the hurricane season, while techniques of mass media advertising should be used to create demand.
5. Regional awards should be promoted for the "Most Hurricane Prepared Farm", and "Most Hurricane Prepared Rural or Fishing Community". Also, regional awards should be promoted for best extension practices in hurricane preparedness and mitigation, thereby giving recognition for professionalism.
6. National Disaster Management Agency representatives and extension officers should speak at service club meetings, especially those that are in rural areas. Joint efforts should be made to mount exhibits and displays at trade shows, agricultural fairs, workshops, World Food Day activities, school public speaking competitions, and so on.
7. Rural phone "hot lines" should be established, especially leading up to and during the hurricane season. These hotlines should be incorporated as part of regular live radio call-in programs during the same periods.

Agriculture and livestock production

Despite the importance of agriculture to the economies of the island states of the Caribbean, farming does not command a great deal of social status and respect. In many instances, farming is viewed as a "last chance" occupation that persons go into only if nothing else is available. This in turn encourages a "short-term" planning horizon, rather than a long-term sustainable approach to agricultural and livestock production. This attitude poses a problem because most hurricane mitigation measures are long-term, although they require investment of labour and capital in the short-term. Communication efforts are needed to raise the status of farming and encourage a sustainable agriculture mentality not only among the farming community, but also in the general public.

In many Caribbean countries, farmers view the government as a type of "insurance" in case of disasters. There is a dependency view among farmers that the government, or perhaps a donor agency, will bail them out if a disaster occurs. Communication efforts therefore need to consider both of these dimensions and clarify the misconceptions that exist.

Little attention has been paid to the wastage of agricultural produce as the result of hurricane damage and the potential of agro-processing to address this problem. The role that agro-processing could play in salvaging or absorbing post-hurricane agricultural resources should be explored. Root crops, which are the most important to food security in many countries are the least vulnerable to hurricanes. Their production should be encouraged during hurricane season.

Many farmers do little to protect their livestock from hurricane dangers. Cattle, donkeys and small ruminants are simply let loose to fend for themselves. In many instances, they are not even taken to safe areas. It is thought that little can be done to protect poultry and rabbits. Livestock sheds are not routinely built to withstand flooding or wind damage, although in Dominica there is evidence that

farmers use windbreaks to protect livestock sheds and routinely prune the branches prior to the hurricane season. Extra water, feed and medication are not routinely stored for animals as a preparedness tactic. As a result, livestock may survive hurricane winds, but starve either because farmers did not store enough feed or because farm roads are blocked and supplies cannot get through.

Record-keeping

While it is widely recognized that it is important to encourage small farmers to think of their farms as a business, to develop business plans, to keep adequate records and to develop land use plans, this is happening only on a very limited basis in the Caribbean. The only evidence that these practices occur is when farmers seek a loan or credit and, therefore, have to provide records to the credit agency. Hurricanes pose a risk for small farmers and need to be adequately calculated in the costs of production. This is especially important in light of how little crop insurance is available in the region. Farm records are critical if extension officers are expected to help assess damages for post-hurricane efforts. Ways to communicate hurricane risk analysis as a factor of production need to be found, and simple record keeping tools developed so that it is easy for farm families to maintain adequate records.

Even in countries that have had fairly extensive hurricane experience, assessments of damage usually consists of "guesstimates" by extension officers. The extent to which these estimates may be under-reporting or over-reporting damages is not known. Extension officers need training in damage assessment. Guidelines need to be established that will link farmer records with regular field checks so that the data can then be sent on to disaster relief programs.

Simple, easy to use, basic record-keeping/planning materials need to be designed to incorporate hurricane preparedness. Such materials could include production calendars, visual checklists and specially designed accounting materials. The use of these materials should be built into reporting by extension officers and linked to assessment measures in the event of a hurricane or disaster. The use of these materials should also be linked with marketing boards and crop insurance agencies to facilitate communication and collaboration with their activities.

Forestry

Eco-tourism and nature tourism are important for many Caribbean island states. The protection of forest resources and other natural environments plays an important role in the development of of tourism. Those parties which are most involved in promoting and profiting from this sector, as well as environmental NGOs, need to be part of mitigation and preparedness communication efforts. Measures should be found to involve the eco-tourism sector in communications campaigns. Subsidies to eco-tourism should support the cost of hurricane damage to forests, which would be good public relations for the tourism industry.

Forests are presently vulnerable to hurricane damage because of inappropriate farming practices that put them at risk, such as slash and burn cultivation, bush fires and improper land use. Discouraging these practices will help to protect forests as well as improve farming.

Chain saw training programmes, such as the one adopted in Dominica, should be encouraged throughout the region. This involves training community members in chain saw operation and maintenance so that they can effectively prune trees. This programme should assist the forestry departments of most islands as these units are responsible for clearing trees that block roads after hurricanes and also for maintaining windbreaks. Community training, and the equipping of communities with chain saws would encourage more pruning prior to the hurricane season and would also help with the clearing of farm roads in the post-hurricane period. To be effective, this effort will require chain-saw equipment and training of operators in each community.

Links should be made with national environmental NGOs. Many of these groups are very active in environmental education and can play an important role in communicating the vulnerability of forest resources to hurricanes. Lumber companies and furniture manufacturers should also be encouraged to support public education programs regarding protection of forest resources.

Popular versions of GIS maps should be produced to indicate vulnerable forest areas. Legislation for the protection of forest resources needs to be popularized at the community level and community monitoring groups encouraged to "police" the damage of forest resources for illegal activities such as logging, charcoal burning, and slash and burn agriculture. All of these practices leave forests more vulnerable to the impact of hurricanes.

Community nursery programs should be initiated to encourage the propagation of hurricane resistant tree species for windbreaks around homes, farm buildings, fields and farm roads. The benefits of windbreaks need to be communicated to all members of the community along with information about appropriate species. Communities need to be educated to understand that their

land use practices can affect forest losses during hurricanes.

Fisheries

Less information exists with respect to hurricane preparedness and mitigation in fisheries than in agriculture. The island of St. Kitts, however, provides an important example of safety and preparedness in fisheries and has trained fishers in the use of navigation equipment, radio communication and flare and mirror signals. The same training is very relevant for fisher-folk during hurricane watches and warnings.

The pruning of trees is important not only for limiting damage to buildings, farm structures, and farm roads, but also for protecting fishing boats. In some instances, it has been reported that fishers successfully brought their boats on land to protect them from storm surge, only to have them damaged by falling trees.

Laminated visual checklists of communication signaling steps for fishers (flares, flags, mirrors) should be produced and kept on board each vessel after fishers have passed a training course to learn these skills. Many of the pleasure boats in the island tourism industry are well-equipped with communication equipment. Their owners also know and practice proper hurricane measures. Pleasure boaters often have valuable expertise that could be shared with small fishing vessels. Registration and licensing bodies should regularly disseminate hurricane related information. So should the insurers of boats and fishing equipment and more mitigation measures for aquaculture need to be explored and developed into training materials.

Mitigation measures

For many of the desired long-term mitigation measures, expertise and extension materials already exist, although they may not be seen as related specifically to hurricanes. For example, many countries have initiated some efforts to prevent soil erosion and deforestation. Such initiatives need to be consolidated and summarized with a view to using them for hurricane mitigation as well. A great deal of existing extension material, if viewed from a hurricane mitigation perspective, can be repackaged to promote mitigation. Some of these include:

- soil conservation measures such as minimum tillage and proper drainage
- contour farming
- building diversion ditches
- mulching
- the importance of windbreaks
- food storage and preservation
- livestock feed storage and preservation
- water storage
- reducing potential pest damage after hurricanes
- building hurricane resistant livestock, poultry and apiary structures
- building hurricane resistant nurseries and greenhouses
- the benefits of pruning and top-working
- chainsaw operation and maintenance
- appropriate cropping choices for the hurricane season
- seedling preparation and protection
- simple record keeping for disaster assessment
- hurricane risks as a factor in sound agricultural business
- communication and safety techniques for fishers
- mini-sett propagation of tuber crops

The "demonstration" model has been widely used as an extension communication method in all Caribbean islands. The demonstration of mitigation methods on a community-by-community basis should be supported. National disaster management mechanisms that promote hurricane mitigation measures for the public include important initiatives which could be applied to mitigation for agriculture and forestry. Some of these measures have to do with the retrofitting of homes and shelters using low cost, construction techniques. The same set of skills could be applied to livestock buildings, green houses, nurseries, poultry sheds and apiaries, although the specific building technologies may need to be further researched.

Agricultural marketing

In many Caribbean countries, women play a predominant role in the marketing of agricultural produce such as hucksters or higglers. Much of this marketing takes place in central market areas, but hurricane resistant storage facilities, for the most part do not exist. Plans for developing such storage facilities should be prepared so that market agents can protect their produce during

hurricanes and other disasters. Rental fees, fund-raising, sponsorship or other cost covering mechanisms should be pursued. Also, market venues are important channels for communicating food security and food preparedness to all families who do their shopping at these outlets.

Marketing initiatives to support food security efforts by farmers need to be sought. Barbados is a case in point. In Barbados, the government has a stated policy and practice of ordering and stockpiling foodstuffs in case of a disaster, while at the same time ensuring that the produce ordered is utilized whether or not a hurricane strikes. Demand for certain produce and a level of food security is maintained as a result. This model should be studied further and communicated to other states for possible adoption.

Agricultural private sector and insurance

Because there is little or no crop insurance for many small farmers, there is little perceived economic incentive for them to invest in hurricane mitigation measures that will add to their cost of production. Ways need to be explored to encourage insurance agencies to offer reduced rates as incentives to clients who adopt hurricane mitigation measures. The added productive benefits of these practices need to be highlighted and communicated. Small credit lending institutions should consider incentives for farmers/fishers who adopt and implement hurricane mitigation measures. These should be communicated and publicized.

Crop insurance companies should communicate the benefits of impact mitigation measures for improved production and should offer reduced rates as incentives for farmers who adopt them. The same applies to insurance for fishers that have received safety training.

Farmer and fisher groups

Farmer and fishing associations need to be strengthened so they can play a lobbying role and ensure that hurricane preparedness remains on the national agenda and is a priority within relevant ministries. Group formation and communication training is needed by these associations.

Farmer and fisher groups also need to have realistic perceptions of what governments and disaster management agencies can actually do in terms of hurricane relief. The perception that governments and donor agencies are "insurance funds" needs to be changed. Discussions among representatives from government, the ministries and disaster management agencies need to take place to deal with this issue.

Farmers and fishers should establish a peer group evaluation of each others' practices and, together with the relevant ministries and the regional task force, establish guidelines for "hurricane certification". This should be part of an annual award with much publicity. Exchanges and field trips should also be promoted so as to encourage communication about mitigation. These exchanges should be done nationally and regionally, with follow-up responsibilities and actions built into the opportunity to participate.

NGOs and community development

Materials should be developed for existing rural adult literacy programmes in order to promote hurricane preparedness in agriculture, forestry and fisheries. Full use should be made of all the available local media channels including videos, radio, drama groups, cultural groups, 4H clubs, women's groups, school education programs, service clubs, etc. Posters and print/visual materials should be developed and distributed to churches, clinics, agricultural supply stores, marketing outlets, and other venues that farmers/fishers frequent.

Participatory Rural Communication Approaches (PRCA) conducted jointly with extension, community groups and NGOs should be used to develop community media materials related to hurricane preparedness and mitigation. These should include community checklists, community storage sites, strategies for unblocking farm roads, drain maintenance, vulnerable forest land areas, community skills in carpentry, construction, chainsaw operation, animal care, and so forth.

Ham radio operators should be trained, at least one per rural community. More radio equipment should also be acquired and put in place. CB radios are also required. Solar operated equipment should be encouraged.

The role of rural youth in ham radio operation should be explored as this group is often left out of agricultural activities and needs to play a more vital role. Youth are often drawn to media and find media production to be a good skill to have for future jobs. The ham radio training program used in St. Kitts should be explored as a model in other islands. Rural youth should receive some sort of professional training and recognition as "community disaster specialists" with responsible roles for communicating hurricane preparedness where they live. They should be organized as emergency response cadres to help with relief in the immediate post-hurricane period and should receive the necessary training.

Community relay communication systems need to be developed. If radio communication fails, communities should also know established communication signals and processes in the event that a hurricane strikes. These efforts should include simple laminated checklists of what to do first, when and how. The role of other community media such as drama and participatory video should also be built into an effective overall community communication strategy.

The private sector, such as agricultural marketing boards and input supply companies should be encouraged to cover the broadcast costs involved using mass media channels. Sponsorship and advertising packages should be developed and pitched to these markets for support.

The following are some "ready to use" tips for brochures or radio and television scripts:

Long-term mitigation measures: Agriculture

1. Farmers should avoid planting temporary crops on steep slopes that are 30° or more
2. Keep lands adequately covered with vegetation
3. When establishing windbreaks, use recommended planting material
4. Construct and maintain drains and/or diversion ditches
5. Establish grass barriers
6. Build and maintain hurricane resistant farm buildings
7. Establish contour lines
8. Avoid slash and burn clearing of land
9. Develop a cropping calendar that includes when to adopt hurricane measures
10. Always ensure that there is more than one week's supply of livestock feed
11. Join your local farmers' group
12. With other farmers in your group, establish a revolving credit fund in case of hurricane damage
13. Together with your farmer association, write lobbying letters to the Ministry of Agriculture to ensure that hurricane mitigation and relief measures are adopted as policy and practice. Send reminders before the season begins
14. In low lying areas, farmers must maintain drainage
15. In low lying areas, farmers must use suitable cropping systems
16. Mulching must be practiced
17. Keep appropriate farm records
18. Plant suitable trees to stabilize river banks
19. Treat farming as a business
20. Farmers must play their own part to reduce loss
21. Keep plants and trees pruned
22. Topwork trees

Further information, please contact:
 Address:
 Phone number:
 Name of local emergency contact person:

Hints on hurricane preparedness for agriculture, forestry and fisheries in the Caribbean

THINGS TO DO: LIVESTOCK

1. Make a checklist of all farm animals
2. Give identification marks to all animals
3. Secure inputs such as enough livestock feed to last at least one week, enough medicines for at least one week, and so forth
4. Stockpile feed and place at least 2 feet above ground in dry, flood resistant area
5. Remove cattle and small ruminants from low lying areas and take to higher ground
6. Secure important documents in waterproof containers
7. Farm buildings and livestock sheds should be strengthened or checked and secured as much as possible
8. Store enough water for livestock to last at least one week
9. Collect any eggs from poultry
10. Prune trees/windbreaks near livestock houses

THINGS TO DO: CROPS

1. Remove and secure covering of greenhouses/nurseries
2. Secure inputs - fertilizers, pesticides, and so forth
3. Prune trees and branches that are directly over livestock houses and other farm buildings
4. Secure planting material for the post-hurricane period
5. Harvest crops which are already marketable
6. Secure beehive boxes and take into building
7. Store pesticides and other farm chemicals away from feed and planting materials

THINGS TO DO: FORESTRY

1. Workmen should be contacted and be on standby
2. Vehicles should be filled with petrol/oil
3. Remove and secure equipment
4. Prune branches that pose danger to electrical lines, etc.
5. Ensure equipment is in working order
6. Communication: CB radios should be made available
7. Nurseries - ensure seedlings are secured
8. Watercourses should be cleaned and cleared
9. Remove all logs which can block waterways
10. Remove all logs which can block farm roads

THINGS TO DO: GENERAL FARM PREPAREDNESS

1. Secure farm machinery and tools
2. Farm machinery should be filled with petrol (chainsaws, tractors, etc.)
3. Disconnect all electrical fixtures on farm
4. Remove irrigation lines
5. Secure land title or deed to property and store in safe, dry area
6. Secure farm records and store in safe, dry area
7. Ensure that you have a first aid kit and that it is also stored in a safe, dry area
8. Remove irregular lines and pumps near rivers

**What to do after a hurricane!
A checklist for farmers, forest users and fishers**

POST-HURRICANE TO DO LIST:

AGRICULTURE: Immediate steps to be taken

1. Clean up
2. Check for injured livestock and treat accordingly
3. Burn or bury dead animal carcasses
4. Assess damage to crops, livestock and equipment
5. Do not use food that has been in contact with flood waters for your family or your livestock
6. Contact fellow farm families to provide assistance
7. Stay clear of fallen power lines - notify power company of any downed lines
8. Try to recover important documents including farm records
9. Round-up stray animals
10. Get rid of potential trees/branches which pose problems
11. Check water for contamination
12. Contact Ministry of Agriculture
13. Cows should be milked
14. Listen to radio advisories
15. Salvage any useable crops

FISHERIES

1. Assess damage to boat, landing sites, engines and other gear
2. Listen to advisory
3. Check cold storage to see how it functions

4. Check community groups to check for missing persons
5. Clear debris in and around aquaculture ponds
6. Check water system to see if it is functioning
7. Remove dead fish from ponds
8. Transfer fish to cleaner water

FORESTRY

1. Check all machinery
2. Forest users to do rapid assessment and report damage to Forestry Department
3. Remove or cut fallen trees
4. Clear waterways of debris
5. Report death of any endangered species
6. Dead animals should be burned or buried
7. Report sightings of any new pests
8. Check forestry department before producing charcoal from fallen branches or fallen trees
9. Contact the forestry department for any further information

Things to do: Aquaculture

1. Remove and secure pumps from flood prone areas
2. Feed fingerlings and ensure supply of feed
3. Close down water system from stream
4. Clear areas around ponds

Things to do: Fisheries

1. If time permits, retrieve fish pots - BUT ONLY IF TIME PERMITS! - 36 hours prior to onset of storm
2. Secure boats away from the reach of waves
3. Ensure that the boat is not in danger from falling trees or branches
4. Remove and secure boat engines
5. Remove and secure all gear, safety supplies, and so forth
6. Boats should be turned upside down and tied to poles securely
7. Secure any fish pots that were retrieved
8. Inform all other fishers at sea through radio, flares, flags or mirror communication signals

WARNING!

- Move all large vessels to safe harbour
- Haul boats to approved locations
- All hauling of boats will cease at least 6 hours prior to strike of a hurricane