

Emergency Food Production in Haiti: Getting it Right

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PAPDA's critique of the Haitian Government's Emergency Food Production programme is correct: the programme will worsen the very problems it is supposed to address. Concerned Caricom citizens, with assistance from Bolivia and ALBA, can support Haitian farmers and grassroots organisations to build food production capacity while empowering people at the base and protecting Haiti's soil, forests and water resources.

In response to the destruction caused by the four hurricanes which struck Haiti in 2008, the devastating January 2010 earthquake, and the needs of the large number of people displaced by that catastrophe, Haiti's Ministry of Agriculture, Natural Resources and Rural Development (MARNDR) formulated an Emergency Food Production Assistance Programme. To the best of my knowledge, the document exists only in French but, for those who can read French, MARNDR's 77-page Emergency Programme can be accessed via the following weblink:

http://www.rocahd.org/NOUVELLES_du_DEVELOPPEMENT/PDF/MARNDR_ProqUrgenceProdAli_mentaire_100130.pdf

The Ministry's programme is in two parts. One part covers the following urgent actions to be undertaken immediately and in the short term - 3 to 6 months:

- a) Support for Haitians who have migrated to the rural areas;
- b) Increasing food security;
- c) Economic improvement and development of rural areas;
- d) Ensuring employment and a more equitable income for the urban population who were forced into rural exile.

The other part of the emergency Programme comprises a number of policy actions envisaged for the medium term - 9 to 18 months, of which the following are the most important: Increasing the availability of agricultural production inputs by acquiring and distributing: seeds/seedlings for a number of specified food crops, 60,000 metric tons of chemical fertilizer, an unspecified quantity of pesticides, and assorted materials, tools, and equipment. Other actions include measures in

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support of certain activities: pig rearing, chicken farming, cattle raising, control of vegetal diseases, aviculture, agroindustry etc. The chemical fertilizers and pesticides will be provided at subsidized prices.

Explaining that agriculture is the principal economic activity in rural Haiti, from which more than 60% of the rural population derive their livelihood, and that it is responsible for a large proportion of national food supplies, the Ministry stated its expectation that the emergency programme would have a positive effect on the employment and working conditions of small farmers and agricultural workers and, also, beneficially affect the lives of a large section of the country's population.

Some of the principal objectives of MARNDR's emergency programme are to promote the social reintegration of migrants from the cities in rural areas, to increase their employment opportunities, increase revenue-earning capability through labour intensive activities to enable them to purchase immediate food supplies for their immediate needs, and to establish food security on a permanent basis. Other important policy actions aim to provide assistance to those rural communities, where urban migrants have settled, in order to increase their local food production capacity, thus enabling them to cope better with the increased demand, and effect a gradual transition from food dependence to local food sufficiency. The emergency programme also has the ambitious objective of increasing the proportion of local food products in the food aid provided by international entities.

The only references to, or mention of, agro-ecology in the Emergency Programme is in the context of training in market garden production and soil conservation, and in conducting relevant studies. The influence on Haitian agriculture of the first of those two provisions will, at best, be felt only in the medium or long term, which raises questions as to why it was included in a 6-month/18 month programme. The need for the second item in an emergency programme is very doubtful indeed, in view of the plethora of relevant studies which already exist on the subject. One cannot help drawing the conclusion that those two measures were empty gestures towards the environmental lobby, not intended to have any effect whatsoever.

The emergency programme is estimated to cost a total of \$687 million, more than half of which is allocated to infrastructural projects related to agricultural production - irrigation systems, rural roads, repair and reinforcement of river banks etc. The second most important allocation is for the acquisition of mechanical equipment such as tractors and other motorized farm equipment (\$113.5 million), followed by re-afforestation (\$58.1

million), animal husbandry - cattle and goat rearing, aviculture, apiculture (\$37 million), and anti-erosion structures (\$20 million). Fertilizers (\$18.4 million), pesticides (\$4.7 million) and seeds/seedlings (\$5 million) are the next most important allocations.

Last month, the prominent Haitian NGO, PAPDA, published a 14-page comprehensive, analytical critique of MARNDR's Emergency Programme, in the formulation of which 15 peasant associations participated, including one youth and one women's organization.

That document, apparently, also exists only in French:

http://www.papda.org/IMG/pdf/commentaires_sur_document_speciale_du_MARNDR_Layout.pdf

PAPDA's critique correctly points out that MARNDR's emergency programme perpetuates the neoliberal policies that had impoverished the country's rural population by destroying peasant agriculture. It was the consequence of the elimination of peasant farmers from the domestic food market to the benefit of multinational agro-industrial companies, whose cheaper products were allowed to flood the local market under trade liberalization policies. The resultant destruction of peasant livelihoods had provoked a massive population exodus from rural to urban areas, which led to mushrooming city slums and widespread unemployment among rural migrants.

The PAPDA document concluded, again correctly in my opinion, that the Ministry's emergency programme would not resolve the structural problems of the country's agricultural sector. Declaring that the problem of Haiti's agriculture should be tackled in a global rather than a piecemeal manner, PPDA proposed instead, an alternative agricultural strategy, the principal objective of which would be to create a national agricultural sector that would not be dependent on imported inputs and which would be protected from unfair competition by cheap foreign food imports by a tariff increase of on such imports.

Cutting through the rhetoric of the rationale of MARNDR's emergency programme, which declared agriculture a priority area and emphasized its importance in promoting economic development, the PAPDA document drew attention to the contradiction between such rhetoric and the policy actions envisaged in the ministry's programme, which subordinates local interests to international ones.

"Even though funds are to be provided for agriculture because of its potential for promoting economic growth, one should realize that it is a stratagem intended to facilitate the operation of multinational companies in the agricultural sector. The international financial institutions play a supporting role in that stratagem, either with respect to the import of agricultural inputs, the sale of seeds, the dumping of foods products in the local market, or in determining how investments could be made in Haitian agriculture without undermining

neoliberal policies."

PAPDA acknowledges that the MARNDR programme's requirement that more local food products be included in humanitarian food aid is a positive element, but correctly points out that availability of local food supplies is not fortuitous. It is the result of policies - production support, training, storage etc that must be implemented upstream.

PAPDA justifiably criticized the allocation of such a large part of the programme's budget to the import of fertilizer and pesticides. Underlining the programme's stated intention that all the agricultural inputs, including those two items, would be purchased in the international market, PAPDA declared that it was all done in the interest of the multinationals since Haiti does not produce fertilizer (nor, apparently, pesticides) locally. Moreover, PAPDA also pointed out that the programme did not envisage local fertilizer production in the future, concluding that that policy would perpetuate Haiti's agricultural dependence on foreign inputs rather than promoting national self-sufficiency.

In support of the dependence thesis, PAPDA drew attention to MARNDR's stated intention of providing chemical fertilizers and pesticides at subsidized prices. Although PAPDA did not openly express it, implicit in that apparent "generosity", on the part of the Ministry, towards the country's peasant farmers is the evident objective of getting peasant farmer hooked on such chemical inputs. Once hooked, it would be very difficult for Haitian farmers to subsequently wean themselves away from those environmentally noxious inputs, which will put them in hock to the multinationals. Another point PAPDA could have made is that chemical fertilizer and pesticides are made from fossil fuels, the prices of which have been on a steadily rising curve over the past two years. Since it is not expected that that rising curve will be reversed either in the medium or the long term, but will rather continue on its upward trajectory, the government's subsidized pricing plan is not at all sustainable, at least not at a level with which peasant farmers could cope. The virtually inevitable removal, or substantial reduction, of price subsidies will ruin large numbers of Haitian farmers, causing considerable unemployment, rural impoverishment, and a massive exodus of people from rural to urban areas.

Most importantly, PAPDA underlined the absence, in the Ministry's programme of any mention of bio-fertilizer as an alternative to chemical fertilizer. The Haitian NGO compared the \$315.6 million dollars allocated to infrastructural projects associated with agricultural production with the \$80.5 million allocated to environmental protection activities (reinforcing embankments etc). PAPDA also underlined the sinister significance of the Ministry's exclusion of certain agricultural lands from the emergency programme by restricting its implementation to irrigated or irrigable lands, on the grounds that such lands would be better able to sustain food production over the long term. It is a policy that would exclude the poorer sections of the peasantry, thereby creating greater socio-economic inequality instead of reducing it, which is one of the declared objectives of the

emergency programme.

PAPDA underlined how very dependent Haiti would be on international assistance, in implementing a programme costing almost \$600 million when national funds available for the programme amount to only \$4.5 million, or 0.0008%. PAPDA argued, persuasively, that despite the meagre benefits in the programme for peasant agriculture, because of such great dependence on foreign sources for its financing, *"it will be redrafted, dictated, and revised by international actors. It will be made even worse after USAID and other agencies have imposed their own rectifications. MARNDR denies the existence and resources of the peasant population. This neoliberal choice rejects peasant knowledge and expertise..... MARNDR continues to treat international NGOs, and [foreign] enterprises as genuine national actors in the place of peasant farmers whose interests are always, conveniently, put last."*

PAPDA considers that the current food crisis presents both a daunting challenge and an unusual opportunity for the country. The organization proposes an alternative global strategy to the neoliberal model that has caused enormous destruction to the rural economy and considerable social exclusion. That proposed strategy will be formulated around four strategic programme areas: (a) Agriculture, aimed at achieving the following objectives: national food self-sufficiency, employment creation, and environmentally friendly production practices (b) the Environment (c) Education (d) Culture.

PAPDA's proposed global strategy will mobilize four social forces - women, peasants, youth, artists and artisans - and will promote decentralisation so as to provide the country with a structure that would be capable of dealing more effectively with national emergencies. Declaring that poverty reduction requires a reinvigorated agricultural sector (a conviction that both FAO and the World Bank have held for some time) PAPDA demands that the government make a clear choice in favour of agriculture as an engine of growth that is capable of reducing poverty.

A major premise of PAPDA's global strategy is that a reinvigoration of Haiti's agriculture sector cannot be accomplished without establishing mutually beneficial linkages with other production sectors, such as small agro-industrial enterprises and those specializing in the manufacture of agricultural equipment. Consequently, PAPDA's strategy proposes stimulating domestic demand to facilitate the development of synergies which, in turn, will promote capital accumulation, generate employment, and create comparative advantages which could permit the export of local products to regional markets on favourable terms.

Considered together with the government's Action Plan for the Reconstruction and Development of Haiti (<http://www.normangirvan.info/action-plan-for-reconstruction-and-development-of-haiti>)

[development-government-of-haiti/](#)) which was presented to the recent donor's conference in New York, the two programmes provide a very revealing insight into the government's conception of development, of the place of agriculture in the country's development, and of the type of agriculture it favours. The Action Plan not only dovetails perfectly with MARNDR's Emergency Programme but a close reading of both further supports the arguments and conclusions in PAPDA's critique re the priority given to international interests over national interests, the indecent emphasis placed on imports from the North (which borders on the caricatural), and the marginalization of both agriculture and the environment in the government's reconstruction and development plans.

PPDA's excellent commentary/critique accurately identifies the many weaknesses, inadequacies, and contradictions in the Ministry's Emergency Programme. Commenting on the objective, in the Emergency Programme, of increasing the proportion of local food products in the food aid distributed by foreign donors, the Haitian NGO correctly pointed out that the availability of sufficient local food supplies to make that policy achievable would have required upstream action, on the part of the government, in terms of support to peasant agricultural production. That obviously has not happened and it is most unlikely to occur under current government plans, as laid out in the two programmes - The Action Plan and the Emergency Programme...

In her recently posted article, [Donor Conference: For \\$10 billion, Haiti Surrenders its Sovereignty](#), Kim Ives (<http://www.normangirvan.info/donor-conference-for-10-billion-haiti-surrenders-its-sovereignty-kim-ives/>) Kim Ives made the very sobering point that, of the \$12.2 billion total the Haitian government requested for the next three years at the Donor conference, only \$41 million, or 0.3 percent, would be earmarked for "Agriculture and fishing." Re the objective announced in MARNDR's Emergency Programme of increasing the local component of food aid, citing an article posted on *Haiti Liberté* (Vol. 3, No. 36, 3/24/2010), Ives made the following revealing comment: "*[President] Préval got in trouble last month when he called on Washington to "stop sending food aid" because of its deleterious effects on the Haitian peasant economy.....Préval fell back into line.*" It is, therefore, most unlikely that that ambitious ministerial objective will ever be achieved.

Moreover, as PAPDA stated or implied in its critique, the Emergency Programme (like the Action Plan) appears to have been formulated with one overriding objective - ensure that as much of the budgeted funds as possible are allocated to (Donor country) imports of foreign agricultural equipment and supplies, whether such imports are of benefit to Haiti or not. Consequently, as PAPDA argued, the Donors will surely take full advantage of the fact that all but 0.0008% of the budget for the Emergency Programme will depend on Donor assistance. They will do so either to revise or redraft the programme so as to reduce/eliminate those provisions (like the relatively meagre \$80.5 million allocation for environmental measures, for example) and/or increase the amounts to be spent on imports of fertilizer, pesticides, tractors, farm machinery etc., to the benefit of Monsanto, Caterpillar and other multinational firms.

PAPDA's comments on the inordinate importance, given in the programme, to imported agricultural inputs, the absence of any mention of bio-fertilizer as an alternative to chemical fertilizer, the meagre funds allocated for environment protection and rehabilitation, and the twin issue of food aid and national food security, as well as the sensible measures the Haitian NGO envisages in its alternative programme to deal with those issues, are all very pertinent indeed but several of the points made need to be developed, which I propose to do. I am surprised, for example, that PAPDA did not raise the crucially important issue of ecological or conservation agriculture, apart from the single point concerning bio-fertilizer. The PAPDA document concluded that the Ministry's emergency programme would not resolve the structural problems of the country's agricultural sector. I, myself, would go much further and state that the emergency programme would actually exacerbate those structural problems, which I propose to demonstrate later.

MARNDR's Proposal to Mechanize Haitian Agriculture

Tractors

One important omission, on the part of PAPDA, apart from the global criticism the NGO made re the import of foreign inputs, and the specific mention of the considerable amount of funds allocated to imports of fertilizer and pesticides, is the issue of heavy farm machinery like tractors, and the considerable damage such machinery does to the soil and soil fertility by causing soil erosion and compaction which, eventually, significantly reduces agricultural production and agricultural productivity. MARNDR's Emergency Programme envisaged providing tractors and other unspecified motorized agricultural machinery (ploughs were specified in the Action Plan) on a rental-purchase basis.

The widespread mechanization of agriculture, which began in the United States between the two World Wars (subsequently spreading to other industrialized and industrializing countries), was accelerated during and after the Second World War. It was a labour-saving strategy designed to reduce, to the maximum, dependence on labour. The transition from animal to mechanised traction reduced labour needs from 150 hours to about 25 hours per acre, and even where labour costs were low, the additional savings from gasoline made tractors and self-propelled cotton pickers highly attractive. The 1930s saw the development of the all-purpose tractor, but its diffusion was relatively slow until World War II began. The resulting labour shortage was compensated for by a greater use of tractors, the number of which increased at a rate of ten per cent per year between 1940 and 1950. (Ernest Schusky, Culture and Agriculture: An Ecological Introduction to Traditional

and Modern Farming Systems, 1989).

Moreover, as Robert Loomis pointed out,

*"The extensive reliance on machines in the United States does not indicate highly intensive farming because machinery by itself is not an indicator of intensity. Although some intensification is achieved with mechanisation (e.g. through a better seed bed and a more timely harvest) yields can also be lowered when wide spacing of rows is required to accommodate machinery and when the operation of machinery compacts the soil. What the machine-oriented agriculture of the United States reflects is the optimization of labour in a social environment where land, energy and capital are relatively cheap." (Agricultural Systems, **Scientific American**, September 1976).*

In Haiti, as in the vast majority of countries in the South, where capital is in short supply, and where labour is plentiful, mechanized agriculture is both inappropriate and unsustainable. For a poor tropical country with an abundance of labour to adopt such a policy might have been understandable in the 1960s and 1970s but to do so in 2010, after many decades of experience, on the part of a large number of developing countries have conclusively demonstrated how very damaging it is, is beyond understanding. The example of the French groundnut project in Casamance (Senegal) demonstrates the damage heavy agricultural machinery can cause on fragile, tropical soils by accelerating soil erosion.

René Dumont, the noted French agronomist, has described some of its negative effects in Africa:

"Use of tractors has been uneconomical everywhere: in Boulelel-Kaffrine, the centre for mechanized peasant cultivation in Senegal where they still scrape off the topsoil when they fell trees; at Loudina in the Congo; on the rice plantations in the Niger Valley (Guinea, Mali, Niger) and Logone Valley (Chad and the Cameroon) and at the CRAM in Madagascar." (Rene Dumont, False Start in Africa, 1966). That searing critique of the disastrous consequences of tractor use was written four and a half decades ago.

On the other side of the African continent, both Zambia and Tanzania had similar, well-documented, disastrous experiences with tractors. When Zambia launched a programme, in the early 1970s, to increase food production, the government decided to rely heavily on agricultural mechanisation in order to better achieve its production goals, exactly like Haiti plans to do. Tractor mechanisation centres were established in all the major districts of the country for the use of the 800,000 resource-poor small farmers who, at the time, accounted for most of the country's food

production and for all of its marketed production (Francis Mwanza, Gone to Graveyards, Every One, **CERES**, May/June 1992). Zambian farmers were able to hire tractors at such heavily subsidized rates that their cheapness discouraged the use of ox-drawn equipment, and farmers often preferred to wait for a tractor to become available than use hand tools or animal traction. The resemblance to Haiti's current situation and plans is quite striking, even including tractor rental!

In 1987, Zambia had seventy tractor mechanisation centres with a total of 254 tractors. By 1992, only one of those centres was still operational. The tractor hire programme for small farmers failed because, Zambia, which has neither tractor manufacturing units or facilities for manufacturing spare parts, had to import all tractor equipment, and found itself unable to do so in an economic crisis, made worse by the need to increase budgetary allocations for servicing its large foreign debt. Costly fuel bills and the lack of qualified staff to service the tractors also contributed to an increase in tractor hire fees, which put them out of the reach of the small farmer. Between 1971 and 1989, Zambia imported a total of 12,364 tractors, less than 50% of which were still in use in 1989. The Zambian Government subsequently discontinued its policy of tractor mechanisation, replacing it with programmes to encourage the use of animal traction.

The striking resemblance with Haiti's current situation and plans continues. Haiti still has a large external debt, although much of it has been "forgiven". The country's -desperate economic situation, made very much worse by the earthquake, will make servicing of even that reduced debt both difficult and painful. Like Zambia, Haiti has neither tractor manufacturing units nor facilities for manufacturing spare parts and would thus have to import all the necessary equipment for servicing its tractors. Again, like Zambia, costly fuel bills and the lack of qualified staff to service the tractors will surely lead to an increase in tractor hire fees (even the Haitian government is subject to economic necessity). Just like Zambia, that will surely put tractor hire out of the reach of Haitian peasant farmers with small holdings and limited resources.

A similar attempt at agricultural mechanisation in Tanzania was also unsuccessful. During the period 1963-1965, a total of 673 tractors were distributed to forty-one Farmers Cooperative Unions throughout Tanzania, with the intention of facilitating land preparation for food and cash crops, like Haiti. By 1986, twenty-two of the Farmers Unions had decided not to continue with the tractor hire service because of the financial burden and the serious soil erosion caused by the adoption of that most inappropriate, unnecessary, and soil-destructive technology. (R. D. Mann, Time Running Out: The Urgent Need for Tree Planting in Africa, **Ecologist**, March/April 1990).

One of the principal, expressed objectives of the Emergency Programme is job creation. The allocation of a large sum in the Programme's budget for the purchase (in the international market) of labour-saving agricultural machinery, like tractors, would appear to contradict the programme's stated objective of creating jobs. Considering that the use of such machinery is unnecessary,

counter-productive, even damaging for agricultural production in tropical countries because of the soil erosion and compaction it causes, that contradiction becomes much more glaring.

Underlining the absurdity of the South's indiscriminate mimicry of the North, Octavio Paz mused upon the cultural phenomenon of "*extra-logical imitation*" - the term he coined for "*imitation that is unnecessary, superfluous, and contrary to the imitator's condition*". (The Labyrinth of Solitude: Life and Thought in Mexico, 1967. The proposed purchase of tractors under MARNDR's Emergency Programme (for which international financial aid would be necessary) is a perfect example of the cultural phenomenon of "*extra-logical imitation*". Octavio Paz mused upon it; I am utterly bemused by it.

Mechanical ploughing or Zero Tillage?

Although, the Emergency Programme did not specify the motorized agricultural machinery to be acquired, apart from tractors, the Government's Action Plan did so in the following paragraph:

"THE IMPLEMENTATION OF 5 PROGRAMMES IS TARGETED:

The first program will provide funding for the purchase and distribution of fertilizer, seeds, ploughing equipment, tractors for the farmers as well as tools and fishing equipment for fishermen at reasonable price so as to increase productivity."

The government's planned acquisition of ploughing equipment in 2010, especially since it requires external funding, is most baffling. Such a project flies in the face of long-held expert opinion and tropical country experience, which have established the much greater benefit of zero tillage over ploughing.

More than 30 years ago, Sylvan H. Wittwer, the American agronomist, described some of those benefits:

"Reduced tillage is the most significant technology man has yet developed for control of soil erosion, for maximisation of cover on the land, and for the conversion of energy, labour, water, soil fertility and organic matter for the main food producing areas of the earth. In addition, a higher proportion of land in hilly areas can be brought into production or planted to more profitable crops." Assuring Our food Supply - Technology, Resources and Policy, **World Development**, Vol.5, Nos.5-7, 1977

Three years later, R. Lal, an FAO agronomist, gave a more detailed description of those benefits:

"Zero tillage is a system of seed bed preparation where mechanical soil manipulation is limited to seedling or to fertiliser placement. Weed control is achieved by other means such as chemical or biological techniques. Chemical weed control is brought about through the use of growth regulators such as Gramoxone, Atrazine etc. Biological methods are based on increasing the competition for light, water and nutrients by planting another crop that can easily be suppressed, or by eliminating light through the use of surface covers, such as mulches. Since neither the chemical nor the biological means of seed preparation involves soil disturbance, they are, in effect, erosion prevention techniques. Successful crop yields have been obtained, with the zero tillage system, in different soil and ecological environments." (Crop Residue Management in Relation to Techniques for Soil and Water Conservation, in Organic Recycling in Africa, **FAO**, 1980).

Around the same time, Akinola Agbola, the Nigerian agronomist reported the results of an experiment conducted in the Sahel savannah zone of Northern Nigeria, over a period of several years. The results showed that, two years after utilising mulches in a system of zero tillage, the organic matter content of the soil had increased by twenty per cent. Whereas, on tilled plots, tillage was found to increase the oxidation process of soil organic matter. (Effect of Different Cropping Systems on Crop Yield and Soil Fertility Management in the Humid Tropics, **FAO** (1980)

Further experiments, conducted at Nigeria's International Institute of Tropical, have shown that nutrient losses from surface run-off water in a zero tillage system were negligible compared with the loss of nutrients and organic matter in eroded soil. Such losses of nutrients and organic matter can result in a significant reduction in crop yield, especially in tropical soils with shallow topsoil layers. Artificial removal of surface soil, in experiments, have shown that a loss of 2.5cm of surface soil resulted in a 40% reduction in the yield of maize, and a 50% reduction in that of cowpea.

"It is generally believed that if weeds can be controlled by any other means, the usefulness of mechanical tillage as a method of seed bed preparation is questionable at best, and unnecessary and harmful at worst." (Agbola, 1980).

Tillage, which is essentially a temperate zone practice, is inappropriate for tropical country soil and climatological conditions, because it exposes the soil to the impact of raindrops, a principal cause of soil erosion. Not only is raindrop impact greater in the tropics, but heavy concentrated downfalls are more common than in temperate zones, and the tropical topsoil is thinner and more fragile. The size of raindrops in the tropics is an important factor in soil erosion. Because of large raindrops,

which can attain an average size of 3mm, a rainfall intensity of 150mm or more a hectare, at the beginning of the rainy season (when conditions are most propitious for soil erosion), causes serious damage to soil structure and accelerates erosion as the result of a process which Jen-Hu Chang has described:

"Soil particles, mechanically turned loose by raindrops, are carried away by surface run-off in the humid tropics at a speed rarely equalled in higher latitudes. Once soil erosion has made headway, its effect is cumulative. As the soil mass is gradually lost, its moisture holding capacity is reduced, and erosion is further accelerated." (The Agricultural Potential of the Humid Tropics), **The Geographical Review**, July 1968).

Furthermore, exposed tropical soil has a higher rate of mineralization and it rapidly hardens under the tropical sun. Heavy mechanical tillage tends to compact tropical soils and, if done on a regular basis, the soil structure beneath the ploughed layer is disrupted. Haiti suffers particularly from the climatological conditions described above, as the following passage in MARNDR's Emergency Programme attests: *"Several hundred millimetres of rainfall, occasionally accompanied by strong high altitude winds, battered several [administrative] departments within the space of a few days, causing considerable destruction."* Added to the damaging effects of heavy mechanical tillage on tropical soils, Haitian climatological conditions render the planned acquisition of motorized ploughs most inadvisable.

MARNDR's Emergency Programme is based on agricultural production principles and techniques which are core features of the standard agricultural model adopted by countries in the North. Jules Pretty, Professor of Environment and Society at Essex University has accurately summed up the principal features of that model, which proved so highly productive in the past and, also, so highly unsustainable. After enumerating some of those features – greatly increased consumption of pesticides, inorganic fertilizer, animal feedstuffs, and tractors and other machinery – Pretty observed:

"These external inputs have, however, substituted for natural control processes and resources, rendering them more vulnerable. Pesticides have replaced biological, cultural and mechanical methods for controlling pests, weeds, and diseases; inorganic fertilizers have substituted for livestock manures, composts and nitrogen-fixing crops; information for management decisions comes from input suppliers, researchers and extensionists rather than from local sources; and fossil fuels have substituted for locally generated energy sources. The specialization of agricultural production and associated decline of the mixed farm has also contributed to this situation. What were once valued internal resources have often now become waste products." (Regenerating Agriculture: Policies and Practice for Sustainability and Self-Reliance, 1995).

FAO continues to warn tropical countries against the mechanization of agriculture, reiterating that conventional tillage with tractors and ploughs is a major cause of severe soil erosion. The following is an explicit policy statement on the subject by José Benites, Director of FAO's Land and Plant Nutrition Management Service that was posted on FAO's website in 2001 and which is still in effect:

"With the advent of tractors, farmers started to believe that the more you till the soil, the more yield you get...The truth is that more tillage causes more erosion and soil degradation, especially in warmer areas where the topsoil layer is thin. In fact, soils in tropical countries generally do not need to be tilled. The most desirable form of tillage is to leave a protective blanket of leaves, stems and stalks from the previous crop on the surface. Zero tillage systems provide higher yields at less cost and also save on fuel use and tractor wear and tear." (<http://www.fao.org/ag/magazine/0101sp1.htm>).

Citing the experience of farmers in India, Pakistan, Nepal and Bangladesh, who had initially obtained increased yields by employing Green Revolution technology: improved seeds, irrigation, and higher doses of fertilizer (which Haiti's Emergency Programme envisages), FAO explains that agricultural growth and productivity have begun to slow in many high-potential areas because of "soil nutrient mining, declining levels of organic matter, increasing salinity, falling water tables and the build-up of weed, pathogen and pest populations." FAO states that the challenge facing the Asian region is to further increase productivity while making agriculture more efficient, ecologically sound, and sustainable. According to FAO, the answer to that challenge

"will not be more irrigation and chemical fertilizer. Instead, recent research indicates, farmers could produce more - and help conserve their natural resource base - by abandoning current land ploughing and harrowing practices in favour of "zero tillage", the simple technique of drilling seed into the soil with little or no prior land preparation."

A similar challenge faces Haiti - how to "further increase productivity while making agriculture more efficient, ecologically sound and sustainable." Haiti should answer that challenge, which is so crucially important for the country's economic future, **not** by increasing supplies of fertilizer and pesticides and providing more tractors and ploughs to peasant farmers, as the Emergency Programme envisages, but "by abandoning current land ploughing and harrowing practices in favour of "zero tillage." Conservation agriculture is a way for Haiti to meet that major challenge. It is an alternative agricultural development model that has convincingly proven its value and its effectiveness.

The cumulative advice of agronomists and FAO experts concerning the disastrous effects of tractor use and mechanical tillage in tropical country agriculture is so explicit and unequivocal that it makes one wonder if the UN's Food and Agriculture Organization, which is the acknowledged international authority on this centrally important sectoral activity, was consulted when the Emergency Programme was formulated. One cannot help wondering, also, whether the international experts who doubtlessly "assisted" in the formulation of the Programme included such a damaging provision wittingly or unwittingly.

Conservation Agriculture (CA)

The website of FAO's Agriculture and Consumer Protection Department, which can be accessed at the following link <http://www.fao.org/ag/ca/>, declares that conservation agriculture (organic agriculture) holds tremendous potential for all sizes of farms and agro-ecological systems, but that its adoption is perhaps most urgently required by smallholder farmers. Haiti's farmers are, overwhelmingly smallholders, which would suggest that that system is ideal for the country. Moreover, as FAO states, conservation agriculture is a way to combine profitable agricultural production with environmental concerns and sustainability (which is exactly what Haiti needs) and that it has been proven to work in a variety of agroecological zones and farming systems. According to FAO, conservation agriculture would also improve the livelihoods of farmers, which is one of the expressed objectives of MARND's Emergency Programme. Conservation agriculture appears to be "tailor made" for Haitian farmers. The problem is how to convince the Haitian Government of that well-documented fact, which is supported by tropical developing-country experience, expert opinion, and actual field tests.

FAO states that CA offers farmers an array of practices but, at its core, are three interlinked principles which can be applied in a variety of combinations to meet the needs of resource poor farmers. Those principles are continuous minimal mechanical soil disturbance; permanent organic soil cover: diversified crop rotations of annual crops and plant associations of perennial crops:

"Conservation agriculture offers a powerful option for meeting future food demands while also contributing to sustainable agriculture and rural development. CA methods can improve the efficiency of input, increase farm income, improve or sustain crop yields, and protect and revitalize soil, biodiversity and the natural resource base. Conservation agriculture provides knowledge and tools to enable farmers to achieve acceptable profits from high and sustained crop production levels while, at the same time, conserving resources and protecting the environment. CA methods enhance natural biological processes above and below the ground by reducing interventions such as mechanical soil tillage to an absolute minimum. They also ensure that application of external inputs, such as agrochemicals and mineral or organic nutrients, does not interfere with, or disrupt, biological processes."

http://www.un.org/esa/sustdev/csd/csd16/documents/fao_factsheet/conservation.pdf

FAO further emphasizes that CA has tremendous potential for achieving sustainable yield increases by improving growth conditions for crops and the efficiency of input. It protects the soil from sun, rain and wind and allows soil micro-organisms and fauna to take on the task of "tilling" and soil nutrient balancing - natural processes disturbed by mechanical tillage. Moreover, CA reverses soil degradation processes (42.6% of the total land area in Haiti is degraded) and builds up soil fertility by facilitating better infiltration of rainwater and enabling the recharge of ground water which reduces erosion and leaching and, in turn, water pollution: "CA reduces crop vulnerability to extreme climatic events. In drought conditions, it reduces crop water requirements by 30 percent, makes better use of soil water and facilitates deeper rooting of crops. In extremely wet conditions, CA facilitates rain water infiltration, reducing the danger of soil erosion and downstream flooding."

The CA agricultural model thus appears to be a perfect solution for the whole range of Haiti's agricultural development problems as well as an ideal response to the clearly expressed needs of the country's peasant farmers. In particular, that agricultural model would provide an effective response to one of the most daunting problems confronting the country - a problem that was graphically described in MARNDR's Programme: *"Haiti has a long history of natural disasters, linked essentially to climatic and meteorological conditions. Such conditions are responsible for the climatic phenomena of **chronic droughts** and **flooding**, from which Haiti has suffered for quite some time...."*

Illustrating the income generation merits of CA, FAO cites the example of southern Brazil, where the income generating opportunities of CA have reversed rural-urban migration. Excessive rural-urban migration is another major problem which has bedevilled Haiti for decades, and greater income generation for farmers is one of MARNDR's principal objectives. The positive experience of farmers in southern Brazil, after adopting the CA model is depicted in the following FAO YouTube video, Conservation Agriculture in Southern Brazil:

(<http://www.youtube.com/user/FAOoftheUN#p/c/195493ECE4D1288E/2/03JcYzx369Y>)

If, for some unfathomable reason, the filmed testimony of Brazilian peasant farmers relating how conservation agriculture has improved their livelihoods, does not convince the Haitian government, it would most certainly convince PAPDA, Haitian peasant farmer organizations, and concerned Haitian NGOs. In the video, we hear testimony from Brazilian farmers of having achieved a 30-40% production increase with conservation agriculture. Noting that such an integrated approach to resource management improves the quality of the local water supply and results in improved soil fertility Increased yields due to José Benites states that *"conservation agriculture could solve the*

food security problem and it is also a valuable weapon in the fight against poverty." Ensuring food security and reducing poverty are two of the Emergency Programme's major objectives.

Rodale is one of America's leading organic-farming research and advocacy organizations. Rodale operates a 333-acre farm in Pennsylvania where it has conducted the longest-running side-by-side comparative study of organic and conventional farming systems in the U.S (Rodale Institute's Farming Systems Trial). Rodale has documented the benefits of an integrated systems approach to farming which applies regenerative, organic practices that include cover crops, composting and crop rotation. Organic (conservation) agriculture has one particularly important advantage for Haiti. According to Rodale's scientists: *"In severe weather, healthy organic soils, regenerative soils, are going to sustain the crop better, are less prone to disasters, and are going to hold the soil better."* (Timothy J. LaSalle & Paul Hepperly, Regenerative 21st Century Farming: A Solution to Global Warming, 2008).

http://www.rodaleinstitute.org/files/Rodale_Research_Paper-07_30_08.pdf

The International Fund for Agricultural Development (IFAD) has also, unequivocally, emphasized the importance for countries in our region to adopt an ecological, organic approach in their agricultural and rural development efforts: *"Countries in Latin America and the Caribbean have a rich natural resource base that IFAD aims to protect and develop by means of its project interventions. Given the close link between poverty eradication and environmental protection, ecological sustainability is a necessary condition for long-term agricultural and rural development in the region."* (IFAD strategy for rural poverty reduction: Latin America and the Caribbean, January, 2007).

The Milpa System

Farmers in our own region (the Mixteca region of Oaxaca, one of Mexico's poorest states) suffered the same unfortunate experience as the Asian farmers cited above, as the result of employing the same intensive agricultural production techniques - a combination of high-yielding seeds, heavy mechanical tillage, and increased use of chemical fertilizer and pesticides. After adopting chemical-intensive varieties of maize in the 1980s, many small farmers in Mixteca experienced decreasing crop yields, in addition to increased soil erosion and soil depletion. The consequent decline in crop productivity made small-scale farming very difficult for Mixtecan farmers, a difficulty that was compounded by a sharp fall in the price of maize. They could no longer afford to purchase the fertilizers and pesticides needed by the new seed varieties they used, with the result that thousands of Mixtecan farmers had no alternative but to abandon their farms, and the region itself, to seek their livelihood elsewhere.

Jesús León Santos, Mexican agro-ecologist, won an international environmental prize in 2008 for sustainable development because of his successful land renewal and agricultural development project in the Mixteca region, by employing ancient indigenous agricultural practices to restore the regional ecosystem. According to a UN study, the region has one of the highest rates of soil erosion in the world, affecting 83% of the land. The indigenous practices that were reintroduced by Santos have transformed the barren, highly eroded area into rich, arable land and also helped refill the region's aquifers.

Santos had revived a pre-Columbian indigenous system of integrated resource management (*milpa*), which applies agricultural principles that are very similar to those employed in conservation agriculture, and successfully re-introduced it to the Mixteca region. That indigenous system completely transformed the barren, highly eroded area. The region's barren hillsides have turned green and its aquifers refilled - results that are strikingly similar to those produced by conservation agriculture. The *milpa* system, which fixes nutrients in the soil and creates natural barriers to pests and disease, produces large yields of food crops without using chemical fertilizers or pesticides. (<http://polyculturedesign.wordpress.com/2009/12/08/milpa/>)

A UN study had concluded that, with 83% of its lands affected, the Mixteca region has one of the highest rates of soil erosion in the world, which makes that remarkable turn around in Manteca's agricultural fortunes even more so. H. Garrison Wilkes, a maize researcher at the University of Massachusetts, has estimated that the milpa system "*is one of the most successful human inventions ever created.*" (cited in Charles C. Mann, 1491: New Revelations of the Americas Before Columbus, 2005).

The *milpa* concept is much more than a system of ecological agriculture - it is a sociocultural construct. It involves complex interactions and relationships between farmers, the local community, the crops, and the land. Leon Santos succeeded where several government programs had failed to reverse the advanced process of land degradation in Mixteca and restore its agricultural and food-producing capacity. With his farmer-led local environmental organization, the Center for Integral Small Farmer Development in the Mixteca (CEDICAM), Santos mobilized the region's small farmers.

CEDICAM farmers modernized some of the ancient techniques in the course of applying the *milpa* system. Natural compost is used for fertilizer, crop rotation is practised, and traditional seed selection has been improved upon. Whatever ploughing takes place is done with oxen because Santos considers that ploughing by tractor would compact the soil too firmly. In the eight villages in the region where Cedecam has operated, crop yields have increased three or four times. The ancient *milpa* system is also a traditional practice in Belize, as it is in all areas of Central America that had come under Maya rule. However, it is unclear whether milpa practices have been modernized and improved upon in that Caricom country, as it has been by Santos and the peasant

farmers of CEDICAM.

Santos adopted a holistic approach, involving not only farmers but entire village communities, in applying *milpa* principles and practices in a communal effort to restore the region's ecosystem. Thus, empowered, CEDICAM's peasant farmers planted more than one million trees in five years to halt erosion - trees that were raised in more than a dozen nurseries which CEDICAM have established in a number of villages in the region. Working communally, the villagers built stone walls to terrace the hillsides and dug long ditches along the slopes to halt the rainwater run-off which removed the soil from hill and mountain sides. Trapped in canals, the water seeps down to recharge the water table and restore dried-up springs. CEDICAM farmers also built hundreds of miles of ditches to retain water and prevent soil erosion. In the following YouTube video, Santos discusses the *milpa* system and how it has restored fertility to degraded Mixteca lands:

<http://www.youtube.com/watch?v=V83bzXvyl64>

The measure of Santos' success in rehabilitating the region's degraded farm lands, and in reviving its moribund agricultural economy, is demonstrated by the slowing down of the rate of migration from the region, as farmers are finding that they could once again make a living at home. It is also shown by the region's farmers, who had previously abandoned their farms and left the region because they could no longer earn their livelihood from farming, and who have been returning to the region in increasing numbers.

According to the FAO scientific study, (Global Assessment of Land Degradation and Improvement I: Identification by remote sensing, 2008), 42.6% of Haiti's total land area consists of degraded lands. In a FAO news release issued on 2 July, 2008, the Director of the Organization's Land and Water Division explained the negative effects of such land degradation: "*Land degradation* [results in] *the loss of biomass and soil organic matter....and affects the quality of soil and its ability to hold water and nutrients.*" The result is accelerated soil erosion, destruction of soil fertility, and a sharp drop in crop yields, if the degraded lands do not become uncultivable, as happened in Mixteca. Moreover, there is a causal connection between Haiti's extensive land degradation and the serious mudslides and flooding provoked by the four hurricanes which battered Haiti last year, and which came in for special mention in MARNDR's Emergency Programme. According to the MARNDR document, the four hurricanes caused 800 deaths, affected 800,000 people, and resulted in an estimated one billion US dollars of material damage.

Degraded lands possess a greatly reduced water-retention capacity that generates more water run-off, which is a principal cause of flooding. The very unstable soils on such lands greatly facilitate mudslides.

If it were to be introduced into Haiti, the *milpa* system could help prevent, or at least considerably mitigate, such destructive flooding and mudslides because of the soil structure improvement it

would engender and because crop rotation, which is an integral element in the milpa system, ensures constant crop cover that protects the bare soil from the elements. There would be no need for chemical fertilizers and pesticides, for which US \$23 million are allocated in the Emergency Programme. Nor will there be any need for tractors, mechanized ploughs, for which there is an allocation of \$113.5 million. In a voluntary communal effort, CEDICAM farmers planted one million trees in Mixteca over the relatively brief period of five years. The Emergency Programme has an allocation of \$58 million for re-afforestation.

MARNDR's Emergency Programme states:

"Taking into account the development potential of irrigated zones, in implementing the Programme MARNDR will concentrate on those regions of the country that possess irrigated or irrigable lands, which, given the scarcity of arable lands, have the greatest capacity to sustain increased agricultural production over the long term."

As PAPDA correctly pointed out, such a policy is most inadvisable because, by focusing on the more arable lands whose owners would necessarily be the better-off farmers, while neglecting the less arable lands owned by poorer Haitian farmers, the Ministry will be actively promoting exclusion and socio-economic inequality.

On the other hand, the *milpa* system would be ideal for Haiti's less fertile, non-irrigable lands, not only because it does not require irrigation but it has also proven very effective when applied to infertile, degraded lands. Unlike MARNDR's programme, the *milpa* system would promote inclusion and socio-economic equality rather than exclusion and socio-economic inequality. The icing on the cake is that, under the *milpa* system, Haitian peasant farmers would not need to purchase fertilizer and pesticides, nor rent tractors, which is another exclusion barrier, even if they could be acquired at government-subsided rates.

MARNDR has allocated \$5 million, in the Emergency Programme, for the purchase of seeds for maize (1,000 metric tons), beans (1,000 tons), and rice (500 tons), in addition to the acquisition of a number of local root crops. Those seeds will inevitably be High-Yielding Varieties (HYV's), not traditional seeds, since the Programme explicitly states that they will be purchased in the international market. Traditional grain seeds are not traded in the international market. This is most regrettable because, although HYV's can produce much higher crop yields, they are much less reliable than lower-yielding, traditional varieties. Not only are they more susceptible to disease and drought but they also require expensive inputs - fertilizer, irrigation, pesticides - both in precise, adequate amounts and on a regular basis for them to produce more than the traditional, low-yielding, seed varieties. The latter are more robust, less vulnerable to drought, and, in a bad crop year, capable of producing a sufficient yield to prevent peasant farmers from starving and to

ensure their economic survival. Perhaps it was HYV's absolutely essential need for adequate and regular supplies of water compelled MARNDR to exclude non-irrigated and non-irrigable lands (and their peasant farmer proprietors) from the activities to be undertaken under the Emergency Programme.

Those exacting requirements make HYVs particularly inappropriate for the climatological conditions in most tropical countries. That is particularly so in Haiti, given the country's very uncertain climatic conditions "*chronic droughts and flooding*" (cited above), to which MARNDR made specific reference in the Emergency Programme. Chronic drought would be absolutely disastrous for Haitian food crops grown with HYV's. Far from ensuring food security, as the Ministry claims in its programme, use of such seeds risk undermining it. There is a wealth of tropical-country experience in support of it but I shall cite only one example. South Africa had to import four million tons of maize to feed its population, in 1992, because its maize crop largely relies on HYVs. In a normal year, national maize production would amount to around nine million tons, but severe drought in 1972 reduced that production to three million tons. (Patricia Baez Lopez, *A New Plant Disease: Uniformity*, **CERES**, November/December 1994). Haiti would not possess the funds to do the same, if its HYV crops were to fail because of prolonged drought which, though it was called a "phenomenon" in the ministerial programme, occurs all too often in Haiti.

A 15-country study of the impact of seeds, which was conducted by the United Nations Research Institute for Social Development (UNRISD), concluded that the term "high-yielding varieties" (HYVs) was a misnomer because it implied that those modern seeds are high-yielding in themselves. Whereas their distinguishing feature is that they are highly responsive to certain key inputs, such as fertiliser and irrigation. In the absence of additional inputs of fertiliser, pesticides and irrigation, HYV's perform less well than traditional, indigenous varieties. Vandana Shiva, the Indian scientist and environmentalist, complements the conclusion of the UNRISD study by emphasizing that the "problem" of traditional seed varieties is not that they are inherently low-yielding, but that they cannot be made to consume high doses of chemical fertiliser. Implying that the "problem" with HYV's is their inputs - fertiliser, pesticides, and intensive irrigation - which, over time, have ecologically destructive effects, she states: "*indigenous cropping systems, on the other hand, are based only on internal organic inputs; seeds and soil fertility come from the farm, and pest control is built into the crop mixtures.*" (*Mistaken Miracles*, **CERES**, July-August 1995).

Vandana Shiva's description of indigenous cropping system, their non-dependence on expensive external inputs, and their valuable ecological strengths, fits the *milpa* system perfectly. Moreover, like other indigenous systems, *milpa* uses traditional seeds, which have been improved by Leon Santos and CEDICAM's farmers. Instead of importing HYV's for maize, rice, and beans, Haiti's traditional varieties of those crops could, similarly, be improved upon by selective breeding to produce higher yields. Utilizing traditional varieties would not only avoid the need for poor Haitian peasant farmers to spend their meagre funds on expensive inputs, like fertilizers and pesticides, but it also would probably ensure greater food security. Moreover, since those external inputs are priced in US dollars, whose value would continue to appreciate with respect to Haiti's weak

currency, the *gourde*, Haitian farmers (and the government itself), would find themselves obtaining diminishing quantities of inputs for the same amount of expenditure.

Haiti has a range of traditional rice, maize, and bean varieties. Rice was brought to Haiti by African slaves more than two centuries ago. There are several traditional varieties which are grouped under two main types - mountain rice and swamp rice. Those traditional varieties are known to be more nutritious than the cheaper, subsidized American rice ("Miami" rice), which replaced them two or three decades ago as a result of trade liberalization. Haiti's traditional rice is therefore better for combating malnutrition, which the government considers a major problem, than imported HYV's. Up to three decades ago, Haiti was self-sufficient in rice production and there is no reason why it cannot become so once more, under a different tariff policy, which PAPDA demands. Maize (corn), which Columbus found being cultivated in Hispaniola when he "discovered" the island, was Haiti's leading food crop in 1987. It was cultivated on as much as 220,000 hectares of land, more than any other crop.

Lastly, the milpa system is a community-based activity, the underlying values of which - community, solidarity, togetherness, and mutual aid - make it ideally suitable for Haiti, because those values are fully shared by the Haitian people. The milpa system thus plays admirably to Haitian strengths. In an interview in the YouTube video, Fault Line Haiti: the Politics of Rebuilding, (<http://www.youtube.com/watch?v=AuUt12usDVs>), Camille Chambers, the PAPDA leader spoke about those values: *"In the camps, people are talking a lot about fraternity solidarity, and mutual aid. They're thinking about what economies built on solidarity look like, about how people who don't know each other can live together and organize and resolve basic problems..."*

Patrick Elie, a Presidential adviser interviewed on the video, saw the values of community, fraternity, and solidarity, which Haitians gathered in the camps displayed in the aftermath of last January's earthquake, as well as their demonstrated capacity for self-organization and resolving basic problems, as possibly constituting a model for another form of development, one that provides *"new lessons in solidarity, in discipline, in resilience."*

Jules Pretty emphasizes the central importance of community involvement in attaining agricultural sustainability: *"A sustainable agriculture cannot be realized without the full participation of collective action of farming households.....A necessary condition for sustainable agriculture is, therefore, the motivation of large numbers of farming households for coordinated resource management. This could be for pest and predator management; nutrient management; controlling the contamination of aquifers and surface water courses; coordinated livestock management; conserving soil and water resources; and seed stock management."* (Pretty, 1995). In the aftermath of last January's catastrophic earthquake, Haitians have shown that they possess the qualities, the capacity, the temperament, and the will to engage in the collective action required for sustainable agriculture, if given the opportunity.

Nutrition, Food Security and Food Aid

The following YouTube video, [How did the Red Cross spend \\$106 Million Dollars in Haiti?](http://www.youtube.com/watch?v=trSfACmrc_E) (http://www.youtube.com/watch?v=trSfACmrc_E) shows a Haitian camp leader, being interviewed, describing camp dwellers as suffering from "extreme famine". In another interview, a female camp dweller, discussing the food supply situation in her camp with the interviewing journalist, showed the latter an imported cookie (a single-cookie ration) which she had received from the Red Cross. On the cookie, which was evidently made and packaged in a Northern country (probably the US), one could clearly see the World Food Programme label.

In its Action Plan, the Haitian Government states that sections of Haiti's population, particularly children under five and pregnant and breast-feeding mothers, incur a serious risk of acute malnutrition:

"There is a risk of malnutrition rates rising during the rainy season. The detection and the treatment of malnutrition will have to be improved so as to ensure coverage throughout the territory. A security net that targets households at risk will be put into place and around 495,000 children below the age of 5 and 200,000 pregnant and lactating mothers will be given additional nutritional supplements."

How does the Government intend to deal with that problem?

"More generally, acute malnutrition among children (between 6 and 69 months) will have to be managed through the distribution of supplements and the setting up of a national system of 10,000 multipurpose agents and 45,000 assistants at the community level to implement a malnutrition prevention program."

The activities relating to food and agriculture in the Action Plan complements the relevant provisions in its Emergency Programme, the leitmotiv of both programmes being, apparently, the same - the maximization of imports from the North. One thing could be said for the government's planned action to combat malnutrition - it creates lots of jobs for Haitians, a grand total of 55,000. The country's malnutrition problem could be better (qualitatively), and more effectively, addressed, at less cost, by importing supplies of quinoa, a traditional food grain that is grown in Andean countries - Bolivia, Peru, and Columbia.

Quinoa's nutritional qualities are considered so outstanding that it is sold as a health food in the United States. Quinoa is high in protein, fibre, unsaturated fats, calcium, iron, phosphorus, and vitamins B and E. Its protein content is higher than that of most wheat varieties and much higher than that of other major cereal foods like rice, corn, and barley. The excellent quality of the protein in quinoa permits a higher percentage of it to be absorbed by the human body than other foods. Amino acids, which cannot be synthesized by the human organism and must be obtained from food sources, are especially important for children in their early growing years. In that particular respect, quinoa appears to be unrivalled. Omar Sattaur, Science editor at the New Scientist, had this to say about quinoa's outstanding qualities: "*It [quinoa] holds exceptional promise as a weaning food for infants, especially in nutritionally-deficient Third World areas.*" (Botanical Entrepreneurship, CERES, January/February 1991). Not only is Haiti, as the Government itself recognizes, "a *nutritionally-deficient*" country, but quinoa appears to be ideal for the age group target by the Government, "between 6 and 69 months".

Quinoa possesses an exceptional balance between oil, protein, and fat. Its nutritional balance comes closer than that of any other common cereal grain to the ideal established by FAO in its reference table for evaluating proteins. Quinoa is also exceptionally rich in lysine, one of the rarest amino acids of vegetable origin, the content of which is much higher than that of other cereal grains (three times that of maize, for example). In that respect, it is comparable to major animal food sources. Most varieties of quinoa are unusually high in the essential sulphur-bearing amino acids - methionine and cystine - which are especially important in correcting deficiencies in vegetable diets. "*While no single food can supply all of the essential life-sustaining nutrients, quinoa comes as close as any other in the vegetable or animal kingdoms [to doing so]*". (Philip White *et al*, Nutrient Content and Protein Quality of Quinoa and Canihua, Edible Seed Products of the Andes Mountains, **Agricultural and Food Chemistry**, June 1955). Moreover, the value of quinoa protein for human beings has been estimated to be at least equivalent to that of milk.

A report prepared for the Copenhagen Consensus Center and the Inter-American Development Bank states:

"Severe malnutrition in early childhood often leads to deficits in cognitive development. Deficient growth development ultimately impinges in the formation of human capital of children and in their productivity as workers. There is, indeed, evidence of direct links between nutrition and productivity. A cost-effective opportunity for LAC is directed toward improving the nutrition of infants and young children through, for example, breastfeeding promotion and improved knowledge about the timing and composition of weaning foods." (Sebastian Galiani, Reducing Poverty in Latin America and the Caribbean, September 15, 2007).

Given the great importance of combating severe malnutrition in babies and very young Haitian children, every effort should be made to acquaint Haitians with "improved knowledge" of quinoa's exceptional nutritional qualities, particularly as a weaning food.

The possible difficulty in persuading people to adopt unknown foods should not be underestimated. People develop their food tastes in childhood, after which it is not easy to become acclimatized to strange foods. But if many health conscious Americans (and Europeans) have taken enthusiastically to quinoa, it should not be difficult to persuade Haitians suffering "extreme famine" to do so. The very fact that quinoa is a valued health food in the United States is probably the best possible recommendation it could have, so great is the South's cultural mimicry of the North. For hungry Haitian babies and very small children, whose taste buds are not yet developed, there should be no problem at all.

If Haitians do take to quinoa, cultivating it in Haiti could be seriously considered. Several varieties of the food grain have been adapted for cultivation at different altitude levels. Quinoa is ideally suited to Haiti's climatological conditions, alternating periods of torrential rain and chronic drought. It is adaptable to rainfall varying from 1,000mm to as little as 250mm annually as well as to high soil salinity. Quinoa would certainly have been able to cope with the "*several hundred millimetres of rainfall*" which battered Haiti within the space of a few days, causing considerable destruction, as reported in MARNDHR's Emergency Programme. During the devastating *altiplano* drought of 1982-1983, which was the worst in Bolivia's history, quinoa was the least affected of the country's major food crops. While quinoa production fell by only 7% during the drought, the percentage by which the production of potatoes (66%), barley (54%), wheat (44%), and cassava (34%) fell was much greater. In Peru, quinoa was the only crop that suffered no production loss at all from the drought. Quinoa should therefore be able to cope quite well with Haiti's chronic droughts.

Another very notorious plant food, amaranth, that originated in the Americas but which has been successfully transplanted to Africa and other regions in the world, could be considered by Haiti, as a means of combating malnutrition. Amaranth, which is now cultivated and eaten around the world, is grown throughout the Caribbean. Where some Caribbean countries, such as Trinidad and Tobago, use taro (dasheen) to make callaloo soup, others, like Jamaica, use amaranth instead. Both taro and amaranth are known by a variety of local names, including callaloo, coco, tannia, bhaaji, or dasheen bush.

The carbohydrate content of amaranth is comparable to that of other cereals, but its protein and vegetable fat content are higher. One species of amaranth (*Amaranthus caudatus*) is not only rich in protein but its lysine content exceeds that of milk. (Noel D. Vietmeyer, *Pitié Pour les Plantes des Pauvres Gens*, CERES, March/April 1978). Furthermore, the leaves of the Amaranthus plant possess two and a half times the vitamin C content of cabbage. (FAO, *Edible Plants of Uganda: The Value of Wild and Cultivated Plants as Food*, 1989) and, like those of cassava and sweet

potato, are rich in carotene which is an important source of vitamin A. Vitamin A deficiency is the most common cause of preventable childhood blindness, from which some 25% of children under five years of age, in Africa and other regions in the South are at risk. Twenty per cent of children with that deficiency face increased risk of death from common infections. (WHO, The World Health Report 1995 1995).

Furthermore, amaranth is low in saturated fat and very low in Cholesterol. It is also a good source of niacin. In addition to Vitamin A, it is a very good source of Vitamin C, Riboflavin, Vitamin B6, Folate, Calcium, Iron, Magnesium, Phosphorus, Potassium, Zinc, Copper and Manganese. (<http://www.nutritiondata.com/facts/vegetables-and-vegetable-products/2304/2>). The cultivation, in Haiti, of this very nutritious food plant could be specially promoted and intensified, as part of the Government's national effort to combat malnutrition.

Mudslides, soil stabilization and re-afforestation

Haiti is one of the most deforested countries in the world, a condition that contributes greatly to the very high incidence of flooding that occurs after torrential rains, and which causes many deaths and considerable material destruction. MARNDR is well aware of the importance of re-afforestation, for which it has allocated US \$58.1 in the Emergency Programme. Under its re-afforestation programme, the Ministry plans to plant more than 70 million trees. No indication has been given as to where the young plants will be obtained - whether they will all come from stocks in Haiti (which hardly seems likely) or whether they will be purchased abroad (which appears to be more in line with the underlying logic of the Emergency Programme).

In its re-afforestation efforts, the Haitian Government might do well to consider the jojoba (*Simmondsia chiensis*) plant, the fast-growing qualities of which would make it a particularly suitable candidate for an emergency programme, in which re-afforestation is a national urgency. Jojoba, which grows wild in Northern Mexico and the South-Western United States, is being promoted as a food plant in the northern part of Mexico because of its recognised nutritional value. Jojoba can also grow in marginal, degraded land, so much so that it is considered to be a plant with the capacity to stop the spread of the Sahara because of its long tap root, which grows 2.5 centimeters a day during the first month after planting, and can reach as long as thirty meters. The jojoba plant can thrive in marginal soils, with as little as 7.5 cm of annual rainfall, and apart from its first year of growth, it does not require irrigation. Those qualities are perfectly suited to Haitian climatological conditions. The jojoba would also be very useful in Haiti for its nutritional and environmental qualities.

Summary Conclusion

Instead of increasing food security, stimulating agricultural development, generating employment for the rural population and post-earthquake urban-rural migrants, and reversing the process of environmental degradation so as to create optimal conditions for re-launching agricultural production, the Government's Emergency Programme is likely to produce results that are exactly the opposite. Indeed, the Programme appears to be designed (no doubt unwittingly) to aggravate rather than ameliorate the desperate situation of the rural majority.

The planned purchase of imported tractors, which is essentially a labour-saving technology, would significantly reduce opportunities for rural employment rather than increasing them. The only jobs that the use of tractors will create are for Caterpillar and similar manufacturers of agricultural machinery. Furthermore, as much developing-country experience has demonstrated, tractors will compact and harden the topsoil, thereby increasing water-runoff and facilitating the destructive flooding associated with such run-off when there are torrential rains, which is a frequent occurrence in Haiti. There is also the damage such heavy agricultural machinery can cause on fragile, tropical soils by accelerating soil erosion. Mechanical ploughing disrupts the soil structure beneath the ploughed layer, causing a loss of nutrients and organic matter which can result in a significant reduction in crop yield. Furthermore, mechanical ploughing exposes the soil to the impact of heavy tropical raindrops, which would accelerate soil erosion particularly, in Haiti's climatological conditions.

The use of HYV's will, almost certainly, increase the risk of food insecurity instead of reducing it, because their absolute need for a regular, adequate supply of water would not be met during the periods of chronic drought to which Haiti is prone. Furthermore, in addition to water, HYV's require the application of fertilizer and pesticides, without which they will not produce well. Over the long term, the regular use of such chemical ingredients will result in a reduction of soil fertility, leading to a more or less sharp decrease in agricultural productivity and production, because of the serious environmental pollution they cause.

The use of HYV's will promote exclusion rather than inclusion, because their absolute need for water has made the Ministry exclude non-irrigated or non-irrigable areas from that part of the Emergency Programme. Proprietors of the less cultivable, less fertile, excluded farm lands would necessarily be the country's poorer farmers. Such exclusion would not only further impoverish the poorer sections of the Haiti's rural population, but would also increase socio-economic inequality which, in the present difficult circumstances, could well cause serious social unrest.

The imported agricultural inputs - tractors, mechanical ploughs, fertilizer, pesticides - which are key components of the Emergency Programme, are either produced from petrol products or depend on

petrol as fuel for their operation. Not only is the price of petrol denominated in a hard currency (the US dollar) but it is likely to appreciate in the near or medium term because it is currently undervalued vis-à-vis the euro and other major currencies. The Haitian Government will find itself having to utilize a steadily increasing amount of its weak (and weakening) currency (the *gourde*) to purchase agricultural inputs priced in appreciating US dollars, in order to continue implementing its declared policy of making those inputs available to Haitian farmers at subsidized prices. That policy is quite simply unsustainable. The Haitian Government will either have to abandon it or sharply reduce the amount of the subsidy. Many Haitian farmers, especially the poorer ones who find themselves unable to pay the higher prices, will face ruin and bankruptcy. The net effect will be a general increase in rural poverty. Farms, with their uneconomical tractors, will be abandoned (as occurred in many African countries which had implemented similar policies), leading once again to massive rural-urban migration.

Possible actions Caricom citizens and citizen groups can take in support of Haitian peasant farmers

There has been an outpouring of sympathy and expressions of support from Caricom citizens and citizen groups for the Haitian people, since the earthquake. There has also been a steady spate of (justifiable) criticism and denunciation of the actions or inactions (undertaken or not) of the international community, donor countries, and international NGO's, in respect of Haiti. We have also provided a certain amount of emergency supplies and assistance to Haitians, in the aftermath of the earthquake. A number of Caricom citizens have also gone to Haiti to offer their assistance. Those actions are merit-worthy. But there are other concrete actions we can undertake to help the Haitian people, particularly the rural majority, realize their expressed wishes and aims.

Between 60% and two-third's of Haiti's population depend, directly or indirectly, on agriculture for their livelihoods, which makes it extremely important for Haiti to get its agricultural development policy right. My analysis of the relevant provisions in both the Emergency Programme and its Action Plan suggest that the Government has not got its agricultural development policy right. The very minor place accorded to agriculture in the Action Plan runs counter to the unanimous opinion of the most prestigious world authorities. The World Bank has declared that agriculture continues to be a fundamental instrument for sustainable development and poverty reduction in developing countries. (World Development Report 2008: Agriculture for Development).

For its part, FAO has emphasized that *"since agriculture is the major source of food, income and livelihood for many of the region's poor, it is the sector which presents the greatest opportunity for socio-economic development, and consequently offers the greatest potential for achieving sustained improvement in the nutritional status of the rural poor."* (Food Production Patterns,

Culture and Development, paper prepared for the World Commission on Culture and Development, June 1994).

After examining the issue of determining priorities in agriculture development, the International Fund for Agricultural Development (IFAD), came to the conclusion that although increases in production by well-off commercial farmers or those in urban manufacturing benefit national income, food availability at the national level, and exports, such increases might have little effect on reducing food insecurity and poverty for the millions of small farmers who live in resource-poor areas. In contrast, production increases by small farmers *"would have a significantly larger impact on poverty than a comparable increase in the incomes of better-off groups"*. (The Challenge of Ending Rural Poverty, 2001).

The Haitian Government's plan to target better-off Haitian farmers (those possessing irrigated or irrigable lands) and exclude farmers in resource-poor areas flies in the face of IFAD's expert advice. In stark contrast to the government's programme, PAPDA's alternative programme gets its priorities right. Its implementation would help reduce rural poverty, promote inclusion rather than exclusion, help increase food security, generate rural employment, and promote environmentally safe agricultural production. In its commentary on MARNDR's emergency Programme, PAPDA declared: *"The current national food crisis presents both a challenge and an opportunity that should be seized."* I agree totally with that statement. It is an opportunity for Haiti to replace the existing classic development model with an alternative agriculture-driven one, like that PAPDA has proposed.

Concerned Caricom citizens and citizen groups should try to find concrete ways to help PAPDA and Haitian peasant farmer organizations implement such a programme. A number of actions and initiatives could be undertaken in the above respect. The issue of malnutrition among very young children and nursing mothers is, by the government's own admission, important and urgent. The possibility of obtaining supplies of quinoa from the Andean countries should be actively explored. Caricom women's' groups, farmer associations, Environmental associations, trade unions, co-operatives, youth organizations, and professional associations of all types - agronomists etc. - could make contact with their counterparts in Bolivia and Peru (which account, respectively, for 46% and 42% of total quinoa production) to explore with them, the possibility of obtaining and channelling quinoa supplies, as donations or on concessional terms. Whatever supplies that can be obtained could be sent directly to selected Haitian NGO's and peasant organisations, for distribution to those Haitians who are most in need.

In Bolivia, which has 50,000 acres of quinoa under cultivation, two organisations - ANAPQUI (the National Association of Quinoa Producers), a federation of 7 local quinoa associations, and CECAOT (the Central of Agricultural Co-operatives Operation Earth), a grouping of 13 local co-operatives - account for the totality of the country's quinoa exports. They both operate on a Fair

Trade price basis. Caricom NGO's could seek funding from their respective international umbrella organizations (most of which receive official subsidies from national and regional sources) to finance the acquisition of quinoa supplies which cannot be obtained as donations.

Their local Bolivian counterparts could use their influence to get Bolivia's President, Evo Morales, interested in channelling such assistance to Haitians via local NGO's. If I am not mistaken, in the past Venezuela has occasionally funded Bolivian foreign aid to neighbouring countries. Both Morales and Chavez would probably be inclined to seize the opportunity to cock a snook at the US by supplying quinoa food aid to malnourished Haitians, as a substitute for American-made nutritional supplements. Moreover, Morales, who places great value on Bolivia's indigenous identity, might see such an initiative as a wonderful opportunity to project his people's identity abroad in the form of a food which they have cultivated for 3,000 years.

Caricom environmental groups could spearhead a regional/international effort to help PAPDA and the Haitian people adopt an alternative model of development which would restore, rather than destroy, the environment. Moreover, according to the Stern report, conventional agriculture of the kind proposed by the Haitian Government is a major source of greenhouse gases. If deforestation, which is often associated with it, is taken into account, the greenhouse gasses produced by conventional agriculture exceed those produced by either the energy or the transport sectors. (Stern Review: the economics of climate change, www.sternreview.org.uk).

The opportunity to make a major contribution to the application, on a national scale, of environmental principles and values, which would give the environmental lobby a tremendous boost, is not one to be missed. The international environmental lobby is one of the most influential lobbies in the world. It not only has considerable funds at its disposal but, also, enormous fund-raising capabilities. Caricom environmental groups could tap both that lobby's influence and its funds to mobilize support for PAPDA's alternative development programme, which would, at the same time, further the application of environmental principles and the achievement of environmental objectives.

In that way, it should be easy to obtain the relatively small sum of money to finance, in coordination with PAPDA and Haitian peasant organizations, a visit by Leon Santos to Haiti to advise farmers how to implement the *milpa* system, or a variation of that conservation agriculture system which can be adapted to Haitian conditions. As a complement to Santos' trip, the visit of a representative group of Haitian farmers to the Mixteca region, in Mexico, to see for themselves how productive and effective the *milpa* system is could be financed. On their return to Haiti, those peasant farmers could demonstrate to other farmers, throughout the country, how to implement that system. Having seen how productive *milpa* is, without the need for expensive agricultural inputs, it is most unlikely that Haitian farmers would spend money to rent tractors and mechanical ploughs, and purchase imported HYV's, fertilizer and pesticides.

Most major UN system organizations provide support, assistance, and funding to NGOs, who operate in the individual organization's area of speciality, to undertake activities that help further the latter's programme activities and objectives. As demonstrated above, FAO has repeatedly underlined the counter-productive, as well as the destructive, effects of conventional agriculture (on which the Haitian Government's Emergency Programme is based). In contrast, FAO has repeatedly vaunted the merits and the beneficial effects of conservation agriculture, strongly advising developing countries to abandon conventional agriculture in favour of that organic system. In Haiti's case, FAO should be asked to put its money where its mouth is. As an intergovernmental organization, FAO cannot intervene directly in Haiti without the consent of the government which Donor countries, whose main objective appears to be the maximization of their countries' exports, are unlikely to permit. However, FAO can intervene indirectly by channelling funds for conservation agriculture activities in Haiti via NGOs with which the organization is associated

In view of the immense worldwide sympathy for Haiti that was generated by the earthquake, it should not be difficult to mobilize sufficient political support, at the international level, to persuade FAO to make such funds available. In view of the passive, low profile role which Caricom governments have traditionally played on the international scene, Caricom may not be willing to take the initiative to mobilize such support for Haitian peasant farmers. But the ALBA Group of countries (of which Dominica and St Vincent are members) would probably not hesitate to do so. If they did so, Brazil would be likely to join them, in view of the peasant background of the country's president. Either through their counterparts in ALBA's Latin American member countries, or through contacts they may have with the Group's two Caricom member states, environmental groups and other concerned Caricom NGOs could propose that the ALBA Group spearhead the mobilization of such international support. The African Union or individual member states would, almost certainly, associate themselves with that initiative, given the great impact Haiti's earthquake has had all over the continent. Senegal's president went as far as proposing that Haitians be welcomed to return "home" and that lands be made available in African countries to Haitian "returnees". Those Latin American countries willing to support such an initiative, and those African countries prepared to associate themselves with it should, together, have enough members on FAO's Governing Body to exercise the necessary amount of influence.

After successfully producing their first productive crop, Haitian peasant farmers would feel a sense of pride and achievement when they realize that they could take their future into their own hands. Such sense of pride and achievement is very empowering. That feeling of empowerment would eventually spread throughout the entire rural population. That empowerment would fuel its own momentum, and there would be no way after that for local elites or external forces to reverse the process. Evo Morales has shown how a country's peasantry, once empowered, could recapture their country, peacefully and in a totally democratic manner, from the predatory elite classes that have long pillaged it, if they are a numerical majority which is the case in Haiti.

April 23, 2010