

THE CREATION OF VULNERABLE POPULATIONS

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The main aim of this chapter is to present case studies of populations vulnerable to natural disaster and to show how such vulnerability may increase as a result of broader social and economic changes over a period of time. The following case studies are drawn from my fieldwork in the Dominican Republic and Martinique from May – August 1980. Research focused on vulnerability to hurricanes, with particular reference to the impact of Hurricane David of August – September 1979 and then also, by chance, with reference to Hurricane Allen which hit Martinique in August 1980 during my fieldwork.

Concepts and hypothesis of research

The concept of natural disaster developed in the course of this and previous projects is that disaster is an interaction between extreme environmental phenomena and a vulnerable human population. Thus the vulnerable state of the population can be considered as much a cause of disaster as the more obvious physical phenomena, such as high winds.

Equally important is the concept of disaster as but the extreme within a series of small events. A population may be adjusted to and can cope with a certain range of natural hazard such as storms, heavy rainfall and flooding, but not the extremes. This is important because methods for the prevention of disaster may in some cases be able to build upon indigenous methods of adjusting to hazard. Hazard then is implicit in a population's normal relationship with its environment.

The distinction between two levels of action to mitigate the effects of extreme environmental phenomena before their impact is also important for understanding the argument. Firstly, preparedness, which refers to the level of action immediately before the impact and includes the development of sophisticated warning systems and measures for the safety of the population and property, such as securing houses and outhouses, evacuation to shelters if necessary, and provisioning the household. The second level of action is prevention. Preventive measures are more long-term and would include improvements in building construction, land-use planning as well as attention to the situation of populations with inadequate resources for livelihood and the implementation of development planning which would improve that situation. While some governments have tackled the problem of the level of preparedness, much still remains to be done at the level of prevention and it is in this latter sense that disaster is clearly a development issue.

The hypothesis of research was that sectors of the population which suffer a restriction or reduction of their resources for livelihood as a result of developments in the wider economy and society are likely to be more vulnerable to natural disaster than populations not affected. In this sense disasters are clearly a development issue.

The research was designed therefore to consider ways that colonial presence and policies (and also those on independent governments which may follow them) may create disadvantaged sectors of the population, in particular by restricting their access to the means of production and distribution, and also to look especially at the state of private large scale agricultural production of export crops and the consequences of this for the majority of the rural population.

Some research previously carried out along similar lines for the case of drought in Africa suggested that this might also be a fruitful approach for considering vulnerability to hurricanes. For instance, Wisner (1977) has shown for Kenya and Meillassoux (1974) for the Sahel that drought is the outcome of several inter-related processes in the nature of colonial domination, the introduction of commercial crops and the subsequent marginalisation of both traditional agricultural and pastoral societies which has in turn lead to over-farming and overgrazing. The cause of deaths from Hurricane Fifi in the Honduras in 1974 and from floods in Bangladesh have also been attributed to structurally similar situations.

As a footnote I might add that when I refer to marginalised populations I am referring to the restriction of that population's control of the basic resources for livelihood. I am not implying that such a population is marginal to the wider economy, since on the contrary, developments in the wider economy may be based on and require such reductions in the resources of sectors of the population and may also depend on that population as a cheap reserve labour force. Thus, marginal populations may be considered as an integrated part of the economy.

A methodology for the investigation of local level vulnerability to natural disaster in rural areas had been developed and tested in a previous case study in Indonesia (Jeffery, 1980). The aim, as mentioned earlier, is to elucidate the characteristics of local social and economic systems, in particular the relationship between subsistence production and production for the market and factors related to this, which affect the resource base of the population at both the household and community level. Further details of the methodology are attached as an appendix.

I would stress that I am presenting case studies of particular areas and communities within the two countries and not an analysis of the national situation as such, although the processes which create vulnerability may be inherent in certain kinds of national economic development, and I have therefore tried to sketch in the relevant national background. The focus of investigation was on rural communities and fieldwork was carried out through informal interviewing and participant observation in selected communities in both islands.

A Note on the Original Inhabitants

The original Indian inhabitants of both islands were wiped out or otherwise removed by the colonial presence.

In the Dominican Republic the Indian population in 1493 has been estimated at 250,000 but had by 1530 been reduced virtually to nil. The causes were various. Some died from disease, others died in the gold mines and in wars against the Spanish. There are also records of mass suicides of Indians in preference to enslavement. Despite the suggestion by the missionary friars that slaves be imported to prevent the extermination of Indians on plantations and in the mines, by 1530 the Indian population had disappeared.

Martinique was discovered by Columbus in 1502, but remained uncolonised by the Spanish. It was not until 1635 that a French expedition defeated the Carib Indians and establishes a settlement at St Pierre on the west coast of the island. The French cleared land on the Caribbean side of Martinique, where there were sheltered harbours and they drove the Caribs to the Atlantic side. Indeed mid-17th century maps show a formal division of the island with a western "terre des Français" and an eastern "terre des sauvages". The eastern Atlantic coast was and is more prone to storms and hurricane winds than the west so this period marks the beginning in Martinique of the increase in vulnerability of certain low status groups.

Relationships between the Caribs and the French steadily deteriorated and led to a campaign to remove the Indians from the island. In 1660 a treaty was signed in St Kitts between the Indians, the British and the French in which the Caribs agreed to leave Martinique for the exclusive occupation of St Vincent and Dominica. Today there are no persons identifiable as Carib in Martinique.

The extermination or removal of the original inhabitants of these islands meant that the land and other resources of the territories fell completely into the hands of the respective European governments and more particularly into the hands of their military and administrative representatives and the settlers who accompanied them. Slaves were imported to replace the Indian labour force.

The Dominican Republic

The Dominican Republic occupies the eastern two-thirds of the island of Hispaniola, and Haiti the eastern third. Many of the key changes that increased the vulnerability of populations of the areas where I studied occurred during the reign of the dictator Trujillo who exercised a complete and personal control over the Dominican Republic from 1930 to 1961. I do not have the space here to analyse fully the historical conditions which made his dictatorship possible. However, the following brief account of Dominican political history is intended to point out the legacy of problems from the colonial era, in particular the political instability of the country. Trujillo temporarily solved this latter problem, though in a manner more acceptable to ill-informed outsiders than to most Dominicans, and the United States supported him because they saw him as bringing a favourable political stability to the country.

A Brief History

Hispaniola was discovered by Columbus on his first voyage of exploration in 1492. Santo Domingo, the capital of what is today the Dominican Republic, boasts a number of "firsts" in the New World. It was the first permanent European city to be established in the Western Hemisphere and also had the first viceregal court, the first audiencia (a judicial, advisory and legislative body); the first cathedral, the first monastery, the first university and the first hospital in the New World.

Although Hispaniola flourished during the first fifty years of Spanish rule as an administrative centre and a base for exploring the rest of the New World, by 1550 it was almost abandoned since the conquistadores began to concentrate on richer hunting grounds of Mexico and Peru. The gold mines quickly became exhausted and after that the cultivation of sugar cane came to be the mainstay of the island's economy. Most of the wealth produced returned to Spain rather than being invested in the island and the colonial period is characterised by a continual draining of the country's resources for the benefit of the colonial power.

In 1795 Spain, after defeat in Europe, ceded the eastern portion of Hispaniola to France, which already controlled Sainte-Domingue (present day Haiti). Shortly afterwards the French colony rebelled, led by Toussaint l'Ouverture, who, in 1805, invaded the Spanish speaking portion of the island. The Haitians were driven out of the eastern part with the help of the English fleet and in 1809 the colony sought to be reunited with Spain. Then in 1821 Spanish Haiti (as it was then called) declared its independence from Spain, which lasted nine weeks until the Haitians invaded the eastern part again. The Haitian occupation, from 1822-44, has been described as cruel and barbarous.

In 1844 the Haitians were driven out of the eastern part. The leader of this independence struggle was Juan Pablo Duarte, who was soon exiled and the government until 1899 was dominated by a succession of three opportunistic dictators, with a period of control by the Spanish crown from 1861-65. After the assassination of the third dictator in 1899, there followed four revolutions and five presidents in the space of six years.

By this stage the country was at the verge of bankruptcy and with the possibility that European nations might send battleships to collect their debts, the US took over the receivership of customs in the Dominican Republic and began to pay back foreign debts. However, the country still lacked any kind of political stability and in 1916 the US invaded, suspended the Dominican Congress and appointed a US military governor to rule by decree. The occupation lasted until 1924 when a new constitution was promulgated and a Dominican president elected. He in turn alienated the Dominicans by continuing the tradition of political patronage to friends and relatives and by extending his term of office from four to six (years). In 1930 a revolution began and the National Army failed to support the government. The army's leader, Rafael Leonidas Trujillo, took over power and remained the leader and dictator of the Dominican Republic until his assassination in 1961.

From its independence in 1844 until the beginning of Trujillo's rule in 1930, the Dominican Republic had 50 presidents (one every 1.7 years) and thirty revolutions (one every 2.9 years). It had also, with the exception of Venezuela, more constitutions (22) than any other country in the world.

Trujillo has been described as "the bastard son of the occupation forces" and it is certainly true that his first steps towards power and influence were made through the national constabulary established by the American occupation forces. His control of the armed forces, of which he was made chief of staff in 1928, was crucial for his accession to the presidency and by various strategies he maintained their loyalty throughout his rule.

The Case Studies

Fieldwork was carried out in selected communities of the municipios of Monte Plata, Bayaguana and Sabana Grande de Boya in the province of San Cristobal. In the Dominican Republic the area selected was not the worst affected by Hurricane David, since where the environmental phenomena is of an extreme intensity it may be sufficient to over-ride the differential vulnerability of populations due to social and economic conditions or at least the hypothesised differential vulnerability may be difficult to reconstruct in that situation.

Vulnerability to Flooding

Much of the sección of San Francisco in Monte Plata is low lying land and certain parajes belonging to it suffered severe flooding as a result of Hurricane David and the tropical storm Frederick. Batey Chirino, Batey Yabacao and La Caguaza are three such affected communities, which are all situated close to the Ozoma river or its tributaries.

The causes of flooding are not a simple matter of topography, but lie also in the deforestation that has taken place this century to clear land for the monocultivation of sugar cane. Batey Yabacao and Batey Chirino were founded by the sugar companies fifty or sixty years ago. However, it seems that the widespread clearing of land did not take place until the 1940s and 1950s in the era of the dictator Trujillo.

Until 1957 La Caguaza, for example, was a community of small scale cultivators, whose production focussed on subsistence crops combined with cocoa, coffee and bananas and the raising of pigs and cattle. Then Trujillo sent in the bulldozers and all the existing crops were destroyed without warning along with a fairly extensive woodland. Over half of the twenty-two households of agriculturalists were completely dispossessed and obliged to leave. Some moved to Batey Chirino and others left the area altogether. No compensation was paid, although the land was said to belong to those farming it.

The area in which these three communities are situated is today almost completely treeless and sown to a considerable extent with sugar cane, much of which is owned by the state. The river banks, without the reinforcement of tree roots, are prone to erosion and are much lower than they were before the deforestation. As a result the rivers burst their banks relatively frequently during the rainy season from June to October. Even without a hurricane there is a constant risk of flooding in these months. Many informants were very aware of this erosion and its causes and effects. (One told me that when Hurricane San Zenon struck in 1930 before the deforestation, one could swim to fetch help, using the trees as resting posts, but that this was no longer possible).

As might be expected from the following, these communities are by no means self-sufficient in crop cultivation. In recent years, land has been returned to some of the original families of La Caguaza and it is used for subsistence crops although much of the good soil (tierra negra or "black soil") is still in sugar cane. Inhabitants of Batey Chirino negotiate with members of neighbouring communities with more agricultural land to obtain plots for subsistence cultivation. Such arrangements are informal and include forms of sharecropping and renting, which may change from year to year. In Batey Yabacao the only land available for agricultural purposes lies in the flood plain of the river. It is not planted with sugar cane because of the risk of flooding. The inhabitants of Batey Yabacao, with no other land open to them, sow this marginal land in the dry season (November-May) with beans and maize. Some also venture to sow rice in these areas in June, but admit that it is a tremendous risk, because there is absolutely no certainty that one will harvest anything, given the risk of flooding from the river at that time.

In the last five years or so a new source of income has opened up for the inhabitants of Batey Yabacao, namely fishing and the sale of shrimps and crayfish to the hotels and restaurants of the capital, Santo Domingo. The impetus for this came from fishermen from the province of Barahona, who began to arrive in the area in search of more lucrative and untapped fishing grounds. They brought with them the nets and wicker traps, which are now also bought or made by the local people. Before the arrival of the Barahonans fishing was done irregularly for domestic consumption only, but now it has become a full time occupation for many men. Intermediaries (from the capital and some of Barahona origin) arrive every morning in small trucks to buy the night's catch. Two men may work with as many as 150 traps between them and earn 20-30 pesos per day, compared with 1-2 pesos labouring on the sugar cane or 3-4 pesos in agricultural wages.

Fishing is thus proving to be a very lucrative activity, but absolutely no conservation measures are taken with fishing taking place all the year round. In addition, weekenders from Santo Domingo sometimes come to fish with dynamite so there is every likelihood that the stocks will become exhausted in a relatively short time, as has already happened in parts of Barahona.

The situation in the parajes of Batey Chirino, Batey Yabacao and La Caguaza is therefore one of vulnerability to flooding consequent on actions taken this century to facilitate the large-scale cultivation of sugar cane. Furthermore, because of the monopolisation of most of the land in sugar cane, the local population is forced to cultivate marginal areas where crop yields are uncertain and in the case of Batey Yabacao they are also over-exploiting fishing resources to obtain a living, with obvious implications for the long-term conservation of these resources. Basic foodstuffs must be imported into the area from other parts of the republic or from abroad, making the communities dependent on the external sources of supply and more vulnerable to any kind of crisis which might affect that supply.

Vulnerability to erosion in the upland areas of Sabana Grande de Boya and Bayaguana

The problem of erosion in this area can only be understood by setting it in an historical context in terms of the relationship between subsistence cultivation and the cultivation of commercial crops, sugar cane and coffee, within the Dominican Republic as a whole during this century. The fertile and low lying land has been increasingly concentrated into the hands of a minority, causing migration both to the urban areas and to open up hitherto uncultivated hilly regions. In the area studied this process can be considered in two stages, the first during the Trujillo era, 1930-1961, and the second in the post-Trujillo period.

The Era of Trujillo 1930-1961

The municipio of Sabana Grande de Boya was founded in 1949 by Trujillo with the intention of opening up the surrounding area for the large scale cultivation of sugar cane. Prior to this the area had been sparsely populated, scattered settlements of small-scale agriculturalists (such as Los Guineos and Gonzalo) coexisting with some larger scale extensive cattle raising. Much of the land was wooded or uncultivated savannah inhabited only by wild pigs and other animals. The small-scale cultivators were subsistence-orientated and exploited only the land that was necessary to meet their needs, using the household labour force.

After 1949 the area changed radically. Bulldozers and tractors were brought in order to clear not only much of the woodland, but also many of the areas under small-scale cultivation. Little warning was given and no compensation was paid. The inhabitants of Gonzalo, for instance, were completely dispossessed of their land and at least half migrated in search of agricultural land elsewhere while others stayed to work as labourers in the sugar cane. This exodus of small farmers (some of whom moved into the hilly interior) was counterbalanced by the migration into the area of people from all over the Dominican Republic in search of work in the sugar cane and in related services (transport, catering, prostitution, etc.). To this day the town has a reputation for violence and revolt, which members of the neighbouring municipios of Bayaguana and Monte Plata attribute to its being predominantly an unstable community of wage labourers from all parts of the republic.

Bayaguana is a municipio of much longer standing, established in 1606 after devastaciones in the north of the country carried out by the colonial Spanish administration, which entailed the removal of whole plantations from the north coast in order to prevent smuggling. Thus, the inhabitants of Bayaja and Yaguana were relocated at Bayaguana and those of Monte Christi and Puerto Plata were resettled at Monte Plata. The church in Bayaguana dates from this period.

Bayaguana, during the Trujillo period, was characterised by large scale cattle ranching, which was gradually superceded after about 1937 by the commercial production of rice. This commercial production encroached upon the land of subsistence producers in various ways. Although Trujillo's bulldozing techniques seem not to have been used, nevertheless private entrepreneurs obtained land through harassment of small-scale producers or sometimes the land was bought. Powerful family enterprises (such as the Jimenez and the Reyes Valdez) also established rice mills to process their produce in the area.

Towards the end of this period, Trujillo also established sawmills in the hilly areas as, for instance, in El Guanito (Bayaguana) and Los Limones (Sabana Grande de Boya). This seems to have been of some importance for the eventual colonisation of these areas in that after the assassination of Trujillo in 1961, many sawmill workers took over land in the vicinity for agricultural purposes.

The Post-Trujillo Period 1961 –

The assassination of Trujillo and the years of instability which followed it, including occupation by US forces in 1965, seems to have been the signal for a free-for-all in the occupation of state-owned land. It was at this time that the colonisation of the hill areas of Bayaguana and Sabana de Boya became extensive. The majority of migrants came from the coffee growing areas around the city of San Cristobal and the municipio of Cambita Garabitos, although some came from the Cibao valley and from the area east of the hills.

Some migrants were landless, but many seemed to have been previously involved in a small-scale coffee production, which was becoming increasingly less profitable because of low prices for coffee paid locally, and partly because of the scarcity of land suitable for food crop cultivation in the area. This meant that people were obliged to buy their food with their decreasing income from coffee production and those growing difficulties in balancing the household budget, combined with the possibility of colonisation of the hill areas to cause the migration to Bayaguana and Sabana Grande de Boya. The news of the land available seems to have been spread to a considerable extent through personal contacts and networks.

Extensive deforestation occurred as a result of this migration and in the territory of communities such as La Lomita and La Deseada (Bayaguana) and Los Limones (Sabana Grande de Boya) there is no virgin forest whatsoever. Over twenty years since colonisation began crop yields have dropped by more than one half in some areas.

Official ignorance of the extent of this settlement is demonstrated by a government plan in 1979 to include the area of Los Limones in a national park in the Haitises (the name given to the hills). The boundary line as first drawn would have included land inhabited by over 10,000 people and would have meant their dispossession (once again) in order to create the proposed conservation area. The inhabitants protested and a census was carried out to establish the size of the population. As a result of this the boundary line was redrawn to exclude Los Limones.

The vulnerability of urban "shanty settlements"

As in the preceding two sections, the problem of the recent rapid growth of urban shanty settlements can only be understood by setting it in a wider context and by looking at the rural areas for the causes of the accelerated rate of migration.

In the 1970s the dispossession of small-scale farmers in fertile areas continued, caused less by dislocation by brute force than by the more subtle pressures of market forces. Land prices rose because of the demand for areas for sugar cane cultivation (in turn due to the high price of sugar internationally) and poorer farmers, unable to eke out a subsistence and faced with the rising costs of basic consumer goods, decided to sell up and move to the urban areas in search of what they saw as easier and more lucrative work. In some cases, small farmers with plots of land adjacent to each other, grouped together to sell their land as a large block, thereby making it more attractive to the buyer and hoping to achieve a better price. Some, having sold their land, headed for the hill areas to "invade" state-owned land, while others migrated to the urban areas.

During the 1970s, therefore, the number of landless grew and this led to the creation of new barrios in Bayaguana and Monte Plata and the additional growth of the already densely populated shanty settlements on marginal land in Santo Domingo. These latter occupy two kinds of land – one is the very low lying land along the river Ozama (an area known as La Cienaga) and the other the areas of very steep ravines at the northern extremity of the city. In the capital, the material most frequently used in housing construction is corrugated iron sheeting and some houses are composed entirely of this while others have parts of the wall in concrete or wood. Overcrowding is much more of a problem than in rural townships.

In times of impending hurricanes these shanty settlements cause considerable problems for the government, since the inhabitants must be evacuated if heavy loss of life is to be avoided. In May 1980 the ravine settlements in Santo Domingo had to be evacuated because torrential rain threatened to wash the houses into the gulleys. Such regular evacuation, carried out by Civil Defence, is clearly a drain on manpower resources in times of crisis, yet there is a noticeable lack of official comprehension of the cause of the problem, which is consequently not tackled at its source (ie: in the rural areas). The administration deals with the shanty dwellers only at the level of "preparedness" for a cyclone or other extremes of climate and has not developed any longer term "preventive" strategies, which would reduce or relocate these marginal settlements, either through the provision of urban land and better housing or through increasing opportunities for rural employment.

Summary

The analysis of these case studies has shown that the vulnerability of populations to natural disaster can be created by certain social and economic processes, which in this particular context, are implicit in state and private development of commercial agricultural production at the expense of small-scale producers. Such processes include the concentration of land into larger units for the purposes of mechanisation, entailing the dispossession of existing producers either by coercion or by the play of market forces, such as the rise in land prices which (in the context of inflation, rising prices of basic foodstuffs and consumer goods, combined with small-scale producers' limited access to credit in order to increase their production) encouraged the small producers to sell their land and seek alternative sources of livelihood.

In the cases presented the commercialisation of agriculture (in particular the extension of sugar cane production, sensitive to fluctuations in prices in the world commodity market) has not only entailed widespread deforestation of fertile lowlands, but has also forced small-scale agriculturalists into marginal areas either to farm patches of land around the sugar cane or to invade the poorer hill areas (leading to over-farming and erosion). At the same time it has also been a cause of migration to the urban areas and the growth of shanty settlements, which are a drain on public resources in times of extreme environmental hazard.

Martinique

The case of Martinique, an overseas department of France in the Lesser Antilles, offers further possibilities for the refining of the concept of vulnerability and for relating it directly to two levels of policies for disaster mitigation: preparedness and prevention.

In this analysis I will distinguish between vulnerability to the actual impact of physical phenomena and vulnerability in terms of a population's capacity to recover and return to normal after a disaster, including whether its own resources are sufficient or whether outside aid is needed. Martinique is not particularly vulnerable in the first sense, since the preparedness measures (as embodied in the Orsec plan) are extremely good as is demonstrated by the fact that there was no loss of life during hurricanes David or Allen, claimed to be two of the severest hurricanes this century. However, in the second sense Martinique is vulnerable and this can only be explained through the analysis of the island's relationship with the metropole, France, and the kind of dependency implicit in this relationship. In the case of Martinique the reduced vulnerability in the first sense and the increased vulnerability in the second sense are two sides of the same coin.

The Case Studies

Field work was carried out in the communes of Basse-Pointe, Macouba and Grande Riviera. The areas were selected because most of the land is used for large scale cultivation of bananas, a crop particularly vulnerable to hurricane. The aim of research was to isolate the historical factors/processes which have led to the focus on this seemingly unsuitable crop, and to consider the consequences of this for the rural population and for their vulnerability to natural disaster. The monopoly by a small number of planters of most of the cultivable land means that the waged workers have little opportunity to find land for subsistence crops and also that settlements tend to be ribbon developments stretching in thin lines on either side of the road that runs between the cliffs and the boundaries of the plantations. *One settlement, Nord Plage, is situated below the cliffs on a rocky outcrop in a vulnerable situation increasingly being eroded by storm surge, but because land is at a premium the plantation workers who live there cannot afford to move even were land available elsewhere (This italicised section has been crossed out in ink on the photocopied version).*

A Brief History of Martinique

Since Pierre d'Esnabuc landed in 1635, Martinique has remained French territory apart from a few brief periods of British military occupation in the 18th and early 19th centuries. The early settlers laid claim to tracts of land which in many cases their descendants still hold today. A number of the large plantation houses in the north of Martinique boast family trees which trace the family's ancestry back to the founding fathers of the 17th century.

Until relatively recently sugar was the mainstay of the island's economy and the plantations were worked first by imported slaves and after the abolition of slavery in 1848, partly by freed black labour and partly by indentured labour from India.

France's policy towards Martinique and towards her colonies in general has been one of "assimilation", characterised by a direct administration control and exportation of French culture. According to Bradley () this was particularly a consequence of the Jacobin insistence on administrative centralisation which took Paris as the centre from which a civilising mission was to be undertaken. She quotes a Jacobin statement of 1794, "The French revolution was not only for Europe, but for the universe...since we have found the right way of administering European countries, why should the colonies be deprived of it?"

The control of land resources and sugar production by the local white élite in Martinique was not affected by the French revolution, since the English invaded Martinique after the revolution and supported the ancien régime and the interests of the plantocracy.

Although many of the freed slaves moved to the hilly backbone of the island after emancipation where they carried on a subsistence agriculture based on root crops, the greater part of the agricultural land has remained in the hands of the white Martiniquans, or Békés, who have concentrated on crops for export.

In 1946, the Martiniquans voted to be given departmental status and to become an integral part of France, rather than choosing independence as many former British territories have done. This was followed by an influx of metropolitan civil servants accompanied by the increasing migration of Martiniquans to France in search of jobs which the economy of Martinique did not provide. Both a drain and labour drain was created though not enough to prevent the present unemployment rate in the island from being nearly 20%.

Vulnerability to hurricane

There were no deaths in Martinique during either Hurricane David or Hurricane Allen, while in the Dominican Republic there were over 1,200, many of which were due to the collapse of housing or other structures in which people took refuge.

In Martinique the general standard of housing is very good with most houses possessing concrete walls and the roof in either tiles, heavy corrugated iron or concrete. Even the poorer sections of the population may enjoy solid housing because of the availability of non-repayable grants from Social Security for the construction of solid dwellings.

The evacuation of those with less than solid housing is facilitated in Martinique by a very good road system and vehicles from the local gendarmerie are used for this purpose. There are no truly isolated communities in Martinique whereas in the Dominican Republic they are numerous. In the latter some can be reached by dirt roads which often become impassable for vehicles in the wet weather of the hurricane season and many areas cannot be reached at all except on foot or by mule. In addition refuges in the Dominican Republic have not always been hurricane proof, as in the case of the church at San Jose de Ocoa, which was swept away by floods causing the deaths of several hundred people sheltering there.

Despite the excellent preparedness measures in Martinique the rural waged labour population remains vulnerable in the sense that, after a hurricane, they are thrown out of work completely or on to short time with no resources of their own to fall back on. They are also entirely dependent on the plantation owners' decision as to when and if the work should commence on clearing up and replanting after the hurricane. Some owners wait for firm offers of French financial aid before starting work in the aftermath of the hurricane so this can mean delays of up to two weeks or more with consequent hardship for the workers.

The pattern post-David and post-Allen seemed to be for the owners to try to give 2-3 days work a week in clearing up and replanting to their hard core of regular workers, many of whom have been working at the same plantation for 20-30 years, but that workers newer to the plantation and those who tend to move between plantations for a variety of reasons are more likely to be laid off altogether. Several informants also noted a tendency to overwork employees in the immediate post-hurricane period after which there was little work to do. The case cited to me was that of an employer who allocated the task of cyclonner* and clearing up 1000 banana plants as a day's work for one man, while the workers considered that 700 a day was more realistic.

The sexual division of labour in plantation work has interesting consequences for the employment of men and women after the hurricane. The two main jobs of cyclonner and replanting are men's jobs, while women are employed for putting fertiliser on the banana plants by hand and for the cleaning, preparing and packing of the cut bananas prior to the loading into containers for export. There is relatively little demand for women's jobs when the crop has been flattened. In addition, there is an avowed policy of finding work first for married men with "responsibilities" (i.e.: families), before youths and women. This policy does not always take account of the numerous female-headed households in Martinique where the woman is the main breadwinner for her family. In these cases the woman may have been abandoned by the father of her children or he may be working in France (the metropole).

The workers are laid off completely and without any other source of income (e.g.: from a spouse) receive 700F per month for three months or are found temporary work by the mayor's office. Nevertheless, this waged labour population experiences considerable hardship in the post-hurricane period. The majority of them do not have subsistence plots to fall back on – (subsistence crops, particularly the low level root crops, were not badly damaged during Hurricane Allen) – since almost all the plantation land suitable for cultivation is under bananas. Only in one case did one owner, after David, hand over a portion of his estate to his workers, instead of replanting the whole with bananas and in lieu of providing them with waged employment. They were allowed to use the land for subsistence crops on condition that a third of their harvest went to the owner of the land and that he could claim it back for bananas whenever he wished. This arrangement was clearly made because of its convenience for the employer.

There is evidence that some land alternated between subsistence and commercial purposes, according to the landowners' wishes. Another example given to me was of land allotted to workers to pasture their animals on payment of a fee to the landowner. When conditions were propitious, the owner took back this land to cultivate pineapples and the workers were then obliged to keep their animals in their own house plots and to fetch pasture for them.

* cyclonner is a French verb which refers to the process of cutting away the damaged parts or wholes of banana plants after the hurricane.

The situation of vulnerability described above is the product of historical processes initiated in the 17th century when the French first invaded Martinique. Much of the land on the island today is owned by the descendants of the early French settlers and many of the landowners and managers display in their houses elaborate family trees which trace their privileged position back to the 17th century. These white Martiniquans are known locally, and pejoratively, as *békés*. The extremely unequal distribution of landholding can be seen from the accompanying table (Table 1). In Macouba, for example, more than 90% of land (1,244 ha) belongs to six owners, while the remaining 60 ha (4.3% of land) is divided amongst 221 owners (Macouba, Notre Commune, 1979).

From the early days of the colony, the agriculture of Martinique has been export-oriented and most exports have been to France. Guadeloupe, also a former colony of France and granted departmental status at the same time as Martinique, is in a similar situation. The two islands, though less than 80 miles apart, carry on 80% of their trade direct with France and less than 3% with each other (Murch, p19).

Decisions about the export agriculture of Martinique are made by a relatively small group of *békés*, who control not only much of the land, but also have important interests in local financial institutions as well as serving on planning commissions, where they help to decide the nature and amounts of subsidies that they will receive. This control by the *békés*, however, does not always result in the optimum use of land since where land is deemed to be "unprofitable" it may be left unused altogether, as is the case of two plantations in the commune of Grande-Rivière which have been uncultivated for twenty years (except for a portion of one which is rented out to a cultivator of bananas). The people of Grande-Rivière themselves have virtually no access to land except for the hillside gardens which they cultivate. The traditional mainstay of the village was fishing, but now there is an increasing migration to France and Fort-de-France and the growth of weekendism.

The monopoly of key resources by an elite group within the population is an important factor in the creation of the vulnerability of the waged labour population of north Martinique. This factor cannot be overlooked in the attempt to explain the change (at least in the north) from sugar cane to bananas, which latter is particularly vulnerable to hurricane. Although I have not the space here for a detailed analysis of this change, I will nevertheless attempt to outline the situation.

The trend in the north of the island has been to move away from sugar cane and also from coffee and cocoa (the latter two primarily pre-second world war) towards an increasing concentration on bananas. Although bananas were exported from Martinique as long ago as 1907 (20 tons) it was not until after the second world war and particularly during the 1950s that bananas became a widespread and large scale operation.

One author (Allen, 1979) cites a number of contributory causes, including higher labour costs than other sugar producers, a drought cycle as well as losses from hurricanes and tropical storms. He also refers to information leaked from an unpublished official report,

which reveals that planters had misused sugar subsidies to finance their own commercial interests by investing in bananas and other fruit and vegetable crops for export, because the returns on capital on these products were greater. Suggestions on similar lines were made to me in the field and it was claimed, for instance, that one owner of a sugar factory and distillery in Basse-Pointe used the excuse of hurricane damage to close it with the minimum of public fuss from those who thereby became unemployed. It was maintained that he had for a long while wanted to close it down, but had merely been waiting for an acceptable excuse.

It seems ironic that Allen should cite losses from hurricane as a factor contributing to the abandonment of sugar for bananas, since bananas are even more vulnerable than cane to hurricane and high winds. Informants generally agree that although sugar cane is flattened by hurricanes, it does tend to "stand up" again afterwards and still produces, although yields are reduced. The mature banana plants, once flattened, stay so!

Although there are a large number of small banana growers, most production is in fact controlled by a small number of békés. Of the land devoted to bananas, 75% is monopolised by the plantation sector, which represents 12.3% of growers (see Table 2). Allen adds that the békés' control lies not simply in their greater access to land, but also in their ownership of export houses in Fort-de-France, their formation of co-ops for bulk buying of inputs, their better access to credit facilities because of their financial institutions in Martinique, their access to quotas and an assured market in the EEC and also their membership of commissions on economic policy in which they decide their own agricultural policies and with advance notice are able to reorganise their own agricultural activities the better to take advantage of new subsidies.

Despite the two hurricanes David and Allen in successive years, there seemed to be a general determination amongst plantation growers to continue with bananas. After David, there had been some small changes in emphasis in the use of land in several plantations. One, with 60 ha of bananas, experimented with 1.5 ha of avocados. Another increased the hectareage of sugar cane and pineapples, while reducing the hectareage of bananas accordingly.

Plantations, such as the last mentioned one, which have diversified a little are better able to cope in the aftermath of the hurricane. This particular one was able to deploy banana workers on the pineapples and whilst throwing all workers on to short time, some work was found for most of the regular workers. Pineapples, being a low level crop, survives the high winds well, but the possibilities for expansion are limited because much of the market is dominated by established producers, such as Mexico and Hawaii and by those using cheaper labour, such as South America and the Ivory Coast (Murch, p20). Pineapples are also a delicate crop to transport and particularly vulnerable to deterioration, if held up at the docks, for instance by industrial action.

After hurricane Allen, the President of the Conseil-General of Martinique stated the importance of redeveloping sugar cane on the island (France-Antilles, 7.8.80), whilst recognising that Martinique could not afford to abandon bananas and the revenue from them. There are, however, problems in obtaining labour for the seasonal and unpleasant work on the cane. There is some evidence to suggest that a significant proportion of labour on the sugar cane was provided by imported workers from St Lucia and other ex-British territories, prior to the establishment of a quota for foreign workers. Because of the much lower standard of living in St Lucia, the workers are cheaper than Martiniquans and tend to live on the plantations, although their numbers are now considerably reduced since the quota system. It is doubtful whether the reinvestment in sugar cane would improve the employment situation for Martiniquans (who generally do not like work in the cane anyway), since the work is both more seasonal and requires fewer people per hectare than bananas.

There are many critics in Martinique (both individuals and left wing organisations) of the lack of industrialisation and autonomous development on the island, the dependency on a few export crops and the dependency on imports which come mainly from France. It is argued that the present situation suits France and that Martinique provides a useful captive market for French products, whilst the lack of autonomous development causes unemployment and migration. There seems to be some truth in this argument.

The accompanying table (Table 3) indicates the nature of Martinique's major imports and the high proportion of the total occupied by imports from France. Many of these imports, in particular meat, poultry and dairy products, could be produced within Martinique itself given the appropriate investment and changes in land use to production less vulnerable to hurricane.

In contrast to the situation in the Dominican Republic (where over 50% of the population is involved in agriculture) in Martinique only 15.7% of the population is included in the occupational category "agriculture, forestry and hunting", with 2.6% in fishing and 0.2% in extractive industries (see Table 4). Nineteen percent are employed in the secondary sector (including public utilities, construction and public works) and an astonishing 62.5% in the tertiary sector (including tourism, domestic service, transport and administration); 24.7% of the total population is employed in public services and administration and 19.5% are unemployed.

The limited employment opportunities for the qualified and unqualified alike has obviously been an important factor in the migration to France. There is some dispute over the exact numbers of people who leave Martinique every year to seek work in France. The official statistics from BUMIDOM (Bureau pour le développement des migrations) represent only official migrations, whereas other sources claim that for every official migrant, there is at least one "spontaneous" one (Le Naif, No 6, 1980). Le Naif, a Martinique periodical, reckons the total number of migrants to France from 1962 to 1974 (inclusive) to be 55,000, a figure which is double the official one (see Table 5) and which represents 17% of the 1974 population of the island.

Migration, whether temporary or permanent, certainly seems to be widespread and during my fieldwork, almost every family that I talked with had some members who lived or had lived in France.

Settlement patterns

The patterns of settlement in north Martinique have been dictated by the plantation sector insofar as most of the land belongs to the plantations and therefore the villages tend to be ribbon developments on marginal land along the coast or inland alongside ravines. The houses are situated close together with small gardens or, frequently, with none. Previously, many workers lived on the plantations, but this practice has changed partly because of the workers' own wishes and partly because the plantation owners' disinterest in repairing workers' dwellings. A number of informants mentioned that their move to the village had been precipitated by hurricane or other damage to their plantation dwellings, which was not repaired by the owner.

Over a period of time, many workers have built their own concrete walled houses with help in the form of Social Security grants towards work undertaken. Some have built on Nord Plage, an outcrop of rock just above sea level below the cliffs at Macouba. They were obliged to settle there because of the lack of land available anywhere else in the village. Nord Plage is now increasingly threatened with

erosion from the sea and some houses there were rendered uninhabitable by the storm surge and damage caused by hurricanes David and Allen. The inhabitants of Nord Plage were evacuated to a school in Macouba during both hurricanes.

The commune has plans to rehouse the people on the piece of land adjoining the road to Macouba, once the funds are available to buy it from the plantation, but meanwhile the settlement of Nord Plage and its inhabitants remain vulnerable to sea-surge, storm and hurricane.

Summary

In this section I have attempted to show the processes which have created the vulnerability to hurricane of the waged labour population in north Martinique. Investigation focused on this population, since the most severe hurricane damage to livelihood on Martinique was the destruction of the banana plantations. It was therefore decided to study the situation of the population dependent on bananas, despite the fact that they represent a small minority of the total population of the island.

The focus was also on the conditions and problems of the dependent population rather than on the crop itself and the loss of export earnings etc. The aim was to show how the dependency of the population makes them particularly vulnerable to hurricane. Decisions about crops and about work schedules, for instance, are not made by those whose livelihood is most seriously affected by hurricane damage, namely the workers. Instead decisions are made by an elite group which has other resources to cushion the discomfort of economic loss and whose food intake, for instance, is not affected by the consequences of hurricane damage. In post-hurricane Martinique, the most severe effects of unemployment are mitigated by government action in making small payments to or finding temporary alternative employment for those thrown completely out of work. Starvation is thereby avoided, but hardship and dependency are not.

I have tried to show how the economic and social situation of Martinique today (and the vulnerability implied in it) is both a legacy of the colonial era and the product of continuing close ties between the department of Martinique and the metropole. Martinique seems an obvious case of dependent development with its emphasis on the export of a few agricultural products, tourism and employment in administration and other services, accompanied by the migration of the surplus population to France.

Conclusions

The analysis of these case studies is an attempt to bring populations into the disaster equations, not just as "victims", but rather as social groups with potential (more often restricted than realised under existing conditions) to modify and mitigate the effects of the hazards to which they are or may become subject.

Emphasis has been given to the analysis of the normal condition of a population and to the ways in which this may or may not help that population cope with the impact of extreme environmental phenomena or to the ways in which this may force them to contribute to the deterioration of their own environment. This analysis considers the restrictions limiting that population's capacity for action, whether these be restrictions of resources, restrictions on power to make decisions and carry them out or even restrictions of perception consequent on the above or on the habitat, mode of livelihood or tradition. The identification of these restrictions, how they have been created and what purpose they serve is the first step toward resolving them.

In some ways this has been a functionalist investigation in the way it has looked at the function of such restrictions for the wider society and economy and the reasons for their existence. The realisation that the restrictions on certain sectors of the population are in fact necessary for the prosperity of others under a capitalist regime of production is in fact of considerable importance, since it gives both rhyme and reason to a situation which may otherwise appear to be the fault of those who are afflicted by it.

The aim has been to investigate not only the "objective" constraints (such as possession of or access to resources), but also the general parameters of people's daily lives, seasonal and life cycle changes and the possibilities that they themselves perceive (The latter point emerged as of particular importance in the Indonesian case study, Jeffery, 1980).

In all of this, the traditional methodology of social anthropology – in particular informal interviewing and participant observation with a local level focus – has been central to the collection of information on vulnerability. It enables the researcher to talk to people and especially to listen to their own perceptions and opinions and to hear them outline their own problems and priorities without obliging them to tailor (and perhaps distort) their views to fit too-rigidly formulated questions designed by outsiders to their situation. This flexible and open-ended approach means that new issues and new dimensions arise more easily in conversation. Some of this information is difficult to quantify – a common criticism of social anthropology – but nevertheless, I think that similar stories represent a consensus of experience and opinion which should not be ignored.

The focus on normal conditions in a disaster-related investigation may seem strange to some. However, given the basic assumption that the vulnerability of a population is as much a cause of disaster as the environmental phenomena which precipitate it, it is essential to analyse the normal conditions in order to see how and why that population is vulnerable.

The comparison here between the Dominican Republic and Martinique has made clear that the population in the areas studied were vulnerable in different ways to hurricane, though similar underlying processes helped to create that vulnerability. In both areas capitalist agricultural development has concentrated on an increase in production and profit that relegates questions of the general common good to second (if not lower) place and has created marginalised populations, which are vulnerable to extreme environmental phenomena.

In the Dominican Republic, this kind of large scale agricultural development has been directly responsible for deforestation and for the dispossession of small-scale producers, leading in turn to migration, further deforestation, over-farming and soil erosion in the hill areas and over-fishing where this remains the only source of a reasonable income and to the planting of subsistence crops in very flood-prone areas. It has also led to a dependence on imported food crops in the areas studied and to migration to the urban areas and the creation of vulnerable shanty settlements.

In Martinique, the excellent preparedness measures prevented loss of life during hurricane. However, the unequal distribution of land and other resources stemming from French colonisation of the island and the importation of slaves, combined with continuing close ties with France and the lack of autonomous development means that in the area studied the majority of the population is dependent on waged labour on an export crop that is particularly vulnerable to hurricane. In the aftermath of a hurricane, this population is thrown out of work or on to short time, with no alternative source of support other than government hand-outs.

The implications of this kind of research for policy making related to disaster are wide reaching. Since the vulnerable state of populations can be seen to be as much a cause of disaster as the physical phenomena, action intended to reduce the impact of extreme natural phenomena should be directed not only to developing preparedness measures (such as hurricane warning systems and evacuation of populations) and to emergency relief, but also towards more long term strategies for the reduction of the vulnerability of populations to natural disaster.

It is in this latter sense that disaster is clearly a development issue. If certain kinds of development can be shown to increase vulnerability by reducing the resource base of sectors of population by removing their control of the means of production, or by forcing them to cultivate marginal areas and over-exploit the natural environment, or by making them dependent on a crop vulnerable to hurricane, then this should be taken into account in future development planning as well as in the administration of aid related to disaster. I am arguing for an end ultimately to the focus on post-disaster aid to be replaced by greater attention to pre-disaster preparedness and, in particular, prevention strategies (entailing improvement in normal conditions of existence) which will in turn greatly reduce the need for such massive emergency aid programmes as presently exist.

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Jeffery, Susan E (1982) *The Creation of Vulnerability to Natural Disaster: Case studies from the Dominican Republic* Disasters 6:1 pp38-43 (Containing the appendix on methodology referenced on p2 and based upon the sections of this chapter relating to the Dominican Republic).

TABLES

Table 1: The sex of heads of farming units according to size of unit (1973)

Sex	Area of farming unit		Total
	Less than 10 ha	More than 10 ha	
a) Male	21,595	707	22,302
b) Female	4,668	55	4,723
c) Both	26,263	762	27,925
c) as % of total	97%	3%	100%

Source: *Annuaire Statistique de la Martinique Tableau 1X-2: Le sexe des chefs d'exploitation par classe de taille des exploitations*

Table 2: Land resources distribution between peasant smallholdings: medium and large banana plantations (1976)

Size (ha)	No. of owners	Area (ha)
0-5	1,930	2,500
5-25	150	1,300
Over 20	120	6,200
Total	2,200	10,000

Source: SICABAM quoted in Allen 1979 p241

Table 3: Principal products imported into Martinique: total and from France (1976)

Product	Value ('000 Francs)	From France	%from France
	Total		
Meat and fish	108,437	58,846	54
Poultry	21,948	18,265	83
Dairy produce	57,857	55,760	96
Fresh vegetables	20,352	14,838	73
Coffee	4,900	2,743	56
Maize	10,366	10,359	99
Preparations for animals	13,855	13,850	99
Crude oil	99,192	2,727	0.03
Pharmaceutical products	49,520	49,473	99
Machinery and electrical appliances	186,033	128,554	69
Hosiery, shoes and clothes	111,271	100,337	90
Cars and vehicles	127,051	74,878	59

Source: *Annuaire Statistique de la Martinique Tableau XII-2 "Commerce exterieur total avec la France de 1973 à 1976. Principaux produits importes" p138 (modified by author: only major imports appear above, not all contained in Tableau XII-2 and only for 1976).*

Note: From Tableau XII-2

- a) Total value of imports into Martinique: 1,663,186 (thousand Francs)
 b) Total value of imports into Martinique from France: 1,117,982 (--)
 b) as a percentage of a: 67%
 (Calculations by author from Tableau XII)

Table 4: Economically active population according to branch of economic activity in Martinique (1974)

Branch of economic activity	Population involved	Percentage of total
<u>Primary Sector</u>	15,553	18.05
of which:		
Agriculture, forestry and hunting	13,117	15.7
Fishing	2,226	2.6
Extractive industries	210	0.2
<u>Secondary Sector</u>	15,997	19.0
of which:		
Electricity, gas and water	556	0.7
Construction and public works	8,250	10.03
Other transformation industries	4,784	8.0
<u>Tertiary Sector</u>	52,497	62.5
of which:		
Commerce, restaurants and hotels	12,799	15.2
Transport	4,773	5.7
Finance, banks, etc	1,668	2.0
Public services, administration	10,522	24.7
Domestic services	6,729	8.0
Other services	5,741	6.9
<u>Unemployed</u>	20,437	19.5
of which:		
Have already worked	8,905	8.5
Seeking work for the first time	11,532	11.0
Total economically active population	104,484	100.00

Source: 1973/1976 Annuaire Statistique de la Martinique INSEE Tableau IV-3

Table 5: Migration from Martinique to France 1962-1974

Year	Females	Males	Family regroupings	Total
1962	41	451	-	492
1963	54	494	173	721
1964	447	966	222	1,635
1965	781	1,131	486	2,398
1966	699	1,011	729	2,439
1967	579	1,023	831	2,433
1968	511	983	716	2,210
1969	601	1,039	873	2,513
1970	491	954	1,029	2,470
1971	585	865	1,007	2,457
1972	450	1,297	920	2,667
1973	500	1,247	937	2,684
1974	374	1,148	992	2,514
Totals	6,113	12,609	8,911	27,633
%	22	46	32	100

Source: BUMIDOM (Bureau pour le développement des migrations) quoted in Le Naif p13 Tableau III (percentages calculated by the author)