

Environmental Protection in Nicaragua: The Perennial Problem of the Unequal Distribution of Natural Resources and Power.

By

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Abstract

The failure of environmental protection and the continuing environmental crisis in Nicaragua is closely related to the unequal distribution of natural resources and political power. Through its dominance of the political and economic structures, the agrarian bourgeoisie in the period before the revolution, was able to accumulate resources and land, denying those same resources to the mass of the populace. Under intensive, short-term productive practices, the agro-export sector had continually degraded and removed diverse natural habitats. At the same time, peasant producers have been forced to over-use and under invest in their limited holdings. This has had the effect of both degrading peasant lands and, through insecurity of tenure, prevented the introduction of essential resource conservation measures. During the Sandinista revolution attempts to implement environmental strategies were undermined by both a lack of commitment within the new state towards the environment and by the continuing influence of the agrarian bourgeoisie, whose positions within the government enabled it to influence the direction of agricultural and environmental policy. In the post-revolutionary period of the 1990s, the re-accumulation of resources to the agrarian and political elites and the marginalisation of peasant producers further undermines prospects for dealing with the environmental crisis. Field research into recent peasant initiatives for developing sustainable agriculture, reveals these initiatives to be adversely affected by the same limitations of access to resources and political influence which have constrained attempts at environmental protection in the past.

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1.0 Introduction

The underlying causes of the degradation of Nicaragua's natural environment and resources are to be found in the unequal distribution amongst social classes of those resources and the political and economic power associated with them. The pattern of land ownership which existed up until the revolution in 1979 was solidly entrenched by the mid 19th century and the first part of 20th, with an agrarian elite which controlled vast tracts of farm-land set aside against large numbers of small producers many of which famed holdings of less than one manzana¹. This highly unequal distribution of land was then consolidated in the 1950s as agro-export production expanded.

In addition, the agrarian bourgeoisie has utilised the technology of the green revolution to intensify and commodify the natural environment. Environmental systems have been degraded or removed in an attempt to maximise profit, replacing them with less diverse habitats based on the cultivation of agro-export crops. The political power of the agrarian bourgeoisie has enabled it to gain access not only to technology but to economic resources in the form of credit, state subsidies and generous tax allowances and interest rates. This power had also enabled it, in the period before the revolution of the 1980s, to suppress political opposition and to obtain new lands for agricultural through the expansion of the agricultural frontier and the removal of peasant producers from their land (Booth 1984, Brockett 1988, Gould 1990)

By contrast, peasant producers have been forced by the limitations of their land holdings to over-use the natural resources at their disposal or to farm in areas unsuitable for agriculture. In addition, insecurity of land tenure prevents peasant producers from instigating sustainable agricultural practices and the resource conservation methods that are necessary for the long-term protection of top soil, trees and water supplies. Nicaragua's history is littered with examples of peasants being forcibly removed from their land by the expansion of the agro-export sector or abandoning lands which are either exhausted or which they can no longer afford to work. The distress sales currently happening across the country are just the latest manifestation of these processes (Nitlapan Team 1999).

The maintenance of these inequalities was established through the economic and political power of the agrarian bourgeoisie. Power which has not only maintained the position of the elite, but has forestalled much radical change. Rebellions and protests against these conditions were ruthlessly crushed by the Somoza state in the years leading up to the revolution (Black 1981, Gould 1988). Even during the Sandinista years, the agrarian bourgeoisie were able to maintain control of important resources and power. This power was used to influence the direction of agricultural and environment policies. The continued reliance, during the 1980s, on agro-export production through large-scale state and private enterprises for example is an example of the ability of the agrarian bourgeoisie to maintain existing methods of production, severely limiting the scope for less environmentally approaches. At the same time, in protecting the position of their sector, the political and economic elite of Nicaragua were able, through internal and external pressure, to destroy environmental policies that would have further undermined their position.

¹ One manzana approximates to 1.7 acres

In the post-revolutionary era of the last decade, the agrarian bourgeoisie has re-emerged and the process of the re-concentration of resources into their hands has begun. The environmental crisis, which faced Nicaragua before its revolution, remains. Vested interests, intent on maintaining the dominance of large-scale, environmentally degrading production and exchange systems largely succeed limiting the impact alternative approaches on national agricultural and development strategies.

Today, the fragility of Nicaragua's environment has been most evidently shown by the effects of hurricane Mitch in October 1998. Degraded and weakened environments were those most harshly affected by the hurricane. It is no surprise that these are the living and working environments of the poor. The poor barrios of the cities and the steep upland areas in the countryside were devastated, while the rich were only marginally touched by the disaster. The economic elite's greater land holdings, diversity of incomes, capital savings and geographical location allowed them to weather the storm far more effectively than the poor. The accumulation of these privileges has, like the accumulation of land and resources, been achieved through force and the manipulation of the political and economic system. Mitch, many have observed, was much more a human induced disaster than a natural one.

2.0 Somocismo: An Anti-ecological State

Nicaragua under the control of the Somoza state underwent profound environmental degradation and social impoverishment in the period before the revolution. The extensive power of the regime, with its control over large parts of the economic and political infrastructure, enabled the Somoza family and its associates in the agrarian bourgeoisie to exploit the environment and accumulate natural resources and land. By 1979, the Somoza family had accrued some fifteen per cent of agricultural land and large parts of the agricultural infrastructure (IRENA 1988).

The regime effected the environment in two main ways. Firstly, through the direct exploitation and degradation of environments as a result of agricultural expansion, pesticide applications, deforestation and mining. And secondly, through the over-use or improper use of lands for agricultural production, including that by peasant producers forced to over-exploit the land as a result of inadequate access to land and other agro-economic resources. In addition, the complete failure of *Somocismo* to instigate measures or structures for environmental protection was consistent with of a regime which was actively engaged in its exploitation.

The direct effects of the regime can be seen in the massive deforestation as a result of the state's promotion of the export booms in the later half of the century. Between 1950 and 1970, Nicaragua lost almost fifty per cent of its remaining forests (Corrales 1983, IRENA 1983a) This was exacerbated when, from the late 1940s to the early 1960s, the Somoza regime gave large forestry concessions to international logging companies (Ramirez 1984). It also saw increased pressure on wild animal populations through widespread hunting and a flourishing trade in the sale of exotic species, processes which the regime did nothing to prevent and indeed encouraged (Faber 1993).

Peasant producers and agricultural workers were also affected by some of the most intense consequences of export agriculture through daily contact with pesticides and

with resulting high incidences of poisoning. The work of Thrupp (1988), Swezey et. al. (1983), Weir & Shapiro (1981), Collins et. al. (1986), Holland (1973) and Brockett (1988) has documented the occurrence of widespread pesticide abuse and misuse and the subsequent effects on health. Under *Somocismo*, Nicaragua became a virtual testing ground for pesticides whose use was banned elsewhere. As Alexander Bonilla, an ecologist from Costa Rica states;

Somoza reaped the profits of intense exploitation of the land. The Somoza regime was an anti-ecological regime.

(Weinberg 1991)

Somocismo undermined the natural resource base on which peasant subsistence agriculture depended, degraded basic living conditions and increased the susceptibility of the population to disease. The expansion and modernisation of the export sector during in the period of the 1950s to the 1970s had a direct impact in impoverishing the living conditions of the urban and rural poor. It did this, as Vilas (1995) points out, during a time of sustained economic boom and associated wealth accumulation by the agrarian bourgeoisie: highlighting further the growing disparities between the winners and losers in this process. According to Vilas, there was at this time a growing sense of 'poverty production' as well as 'wealth production' as capitalist modernisation and export expansion deepened the inequalities between sectors of the Nicaraguan population. The growing disparity of wealth accumulation: what both Dunkerley (1988) and Faber (1933) describe as '*uneven development*' and de Janvry (1981) as '*disarticulated accumulation*', between Nicaragua's social classes and agricultural sectors, was intensified by the expansion of export agriculture.

The figures for land holding for 1978 (see Table.1) shows the majority of land held by large estates. While small and medium producers held a significant proportion of agricultural land it is important to note that large enterprises consistently commanded the best agricultural land, leaving smaller producers to work less fertile and more environmental susceptible areas. Access to resources and to land is an essential requirement for the survival of rural populations closely linked to agricultural production. The work of Collins et. al. (1986), Leonard (1987) and Wheelock (1980) has shown the highly unequal distribution of land amongst the agricultural population of Nicaragua in the period leading up to the revolution. According to Warnken (1975), by 1975 the largest 1.8 per cent of land owners owned 46.8 of the land, while the largest 12.1 per cent owned 74.9 per cent (Brockett 1988). In addition, more than sixty per cent of the rural population was landless (Collins et. al. 1986), being forced to work as farm workers, under poorly paid, seasonal conditions.

Large producers were also in possession of the infrastructure of agriculture, including process plants, as well as owning mines, large tracts forests and business assets in banking, commerce and industry. These large producers were also able to access banking credit and technical assistance to a degree unknown to their smaller counterparts. Access to credit is important in allowing producers to capitalise on their produce, for investment and the long-term maintenance of their holdings.

Table 1. Changes in land tenure structure 1978-1988 (percentage of agricultural land)

Farm Size (Manzanas)	1978¹	1988¹
Small & Medium Farms	47.6	47.1
Less than 50	17.5	18.7
50 to 200	30.1	28.4
Large Scale Estates	52.4	21.1
200 to 500	16.2	13.5
Greater than 500	36.2	7.6
Sandinista Agrarian Reform Sector	0.00	31.8
Co-operatives	0.00	20.1
State Farms	0.00	11.7
TOTAL	100	100

¹: Wheelock, J. (1990) *La reforma agraria Sandinista: 10 anos de revolucion en el campo*. Managua.

As well as the direct effects of having insufficient land to live on, the dependence of campesino families on small, subsistence plots for survival made them particularly vulnerable to worsening environmental conditions. The loss of even part of the season's crops, the death of animals, drought and crop diseases could devastate the poorer farmers, forcing them to sell their land. Distress sales have been a common feature in Nicaragua, with farmers forced to sell all or part of their land during hard times (Reinhardt 1985, Brockett 1988, Enriques 1991). Large numbers of peasant farmers were also without legal papers for the land they farmed. The export expansions of the 1950s and 1970s showed how easily these farmers could be removed from their land by the agricultural bourgeoisie (Booth 1984). Insecurity of land tenure, insufficient land and the fact that campesinos were often forced to farm marginal areas also had deleterious effects on the environment.

Land-poor farmers have been forced to over-use their land in an effort to extract sufficient yields to survive. This problem was compounded by the fact that their land is often in marginal lands on steep-sided slopes where the top soil is thin (Browning 1971, de Janvry 1981). Deforestation on these once montane environments leaves the land vulnerable to erosion and are quickly exhausted (Russel 1989). The poor nature of these lands and the fact that campesinos are unable to guarantee the long-term

occupation, causes campesinos to take a short-term approach to their management. Conservation measures which could arrest these environmental problems could not be implemented on land that campesinos may not occupy the following season. It is a rationale of land use that while environmentally unsound, is economically understandable. The unequal distribution of land and resources and the issue of land ownership, has therefore, had a direct effect on the social and environmental conditions in Nicaragua.

The cumulative effective of these pressures is shown in that all indicators in Nicaragua in the period before 1979 speak of a country in crisis. In 1971, only 5.9 per cent of rural households had access to potable water and rural homes without sanitation in 1971 was at 82.6 per cent. (Grindle 1986). The World Health Organisation estimated that seventeen percent of all deaths in Nicaragua were due to polluted water (IRENA 1983b). Rates of illiteracy in rural areas in Nicaragua in 1970 stood at seventy-seven per cent (Grindle 1986). In addition, as the export sector expanded from the 1950s and appropriated more resources so the *per capita* output of domestic food production fell (e.g. by thirteen per cent between 1976 & 1978, Collins et. al. 1986). Consequently, by the mid 1970s, the average daily caloric intake of half the population was only seventy-nine per cent of the amount recommended by the United Nations (UN FAO 1976, 1978). In this same period over half of the country's children were malnourished (Black 1981). As a result of these social and environmental conditions, by the 1970s Nicaraguans had the lowest life expectancy in Central America (Karlner et. al. 1986). By 1979, the cumulative effect of these processes of agricultural change and exploitation was to leave sixty-two per cent of the population (eighty percent in rural areas) living in poverty (CEPAL 1992). Peasant producers were increasingly marginalised, with the environmental resources on which their subsistence agriculture depended, eroded away.

The maintenance of *Somocismo* was achieved through the regime's wielding of the economic and political power it had accumulated. When peasants and workers sought to rebel against the social and environmental crisis facing them, the full force of the Somoza regime was brought against them. From the 1930s and into the 1970s, insurgents and protesters were violently suppressed (Gould 1990). Only in 1979, and the revolution led by the FLSN, did opportunities for significant social and environmental change appear.

3.0 The Rise and Fall of Environmental Protection Under *Sandinismo*

Under *Sandinismo* an element of ecological rationale was clearly evident in the aims of the new state to rebuild Nicaraguan society. The nationalisation of forest and mining resources, environmental legislation and management systems, attempts to curtail pesticide use, reforestation and water resource programmes all indicated an seismic shift in the approach of the new state towards the environment. The early years of the revolution provided great opportunities and advances in environmental protection: deforestation levels where reduced, national parks where designated, environmental education was introduced into schools, levels of pesticide poisonings fell dramatically and significantly, the state appeared to be moving towards an development strategy that would include the environment as a core element. As IRENA, the new state' environment agency explained, it wanted to see the role of government changed from one;

“facilitating the wholesale exploitation of wildlife to one which regulated its exploitation and successfully decreased illegal trade”
(IRENA 1988).

However, it is clear that the optimism of those early years was not well founded. By the early 1980s, much of the environment programme had been abandoned. The environment programme more than any other policy was a victim of the particular political and economic conditions under which the Sandinista state operated. The programme failed for a number of reasons. Firstly, because of the pressures which were brought to bare upon it during the economic hardships of the 1980s. Secondly, a result of the failure of important elements of the state to support the programme and finally because of the failure to engage the rural populace in participating in the programme.

Importantly, the accumulation of power and resources which underpinned many of the environmentally degrading processes under *Somocismo* remained under *Sandinismo*. The old agrarian bourgeoisie, while damaged by the political and economic changes of the revolution, were still able to control important economic resources and political positions under the new state. Also, the concentration of power and the control of resources within the state often resulted in unecological policies or policies contradictory to the environmental programme being implemented, with little opportunity for the grassroots to counter them. The power that this concentration of resources and political influence represented was to directly and indirectly affected the direction of state policy towards the environment.

There is no doubt that the external pressures brought about through the United States government's determination to destroy the Sandinista revolution was crucial to the demise of the environment programme. The Contra War's debilitating effect on the economy, forced the state to reallocate resources away from environmental projects and towards the military budget. The war also affected the environment programme through the Contra's direct attacks on environmental personnel and programme infrastructure. The war, and the United States economic embargo also placed great pressure on the Sandinista state to raise hard currency in order to maintain the economy and essential imports. As agro-export production continued to be the mainstay of hard currency provision, resources were consequently channelled into those areas of export agriculture which were perceived to be most significant for production (Enriquez 1991, Faber 1993, Jonakin 1997) Namely, those large farms which remained within the hands of the agrarian bourgeoisie or had been taken over as state enterprises.

Here we have an example of another significant factor which affected the environment programme, that of ideology. The received wisdom of the Sandinista state (and the Somoza state before it) was that these large enterprises constituted the most important elements of agro-export production. In reality, it was the small and medium producers which made the most significant contribution to production and which did so most efficiently. Despite this, the state continued to heavily support large producers, leaving many small producers under-resourced and unable to improve their holdings. The need to maintain agro-export production led to the continuation of environmentally

damaging agricultural practices such as the high use of fertiliser inputs and pesticides, the over-use of soils and the poor use of forestry resources. The rationale which favoured the large enterprises and the technological practices of the green revolution is less surprising when one considers the make-up of the managers of the ministries involved in the decision making process in this respect.

While the political power of the Somoza family was smashed by the revolution, significant parts of the agrarian bourgeoisie remained largely untouched. This is due in part to the policy of the FSLN which favoured a strategy of a broad popular alliance against Somoza before the revolution and which continued after 1979 in the reconstruction of the country. Members of the intelligentsia, business class and agrarian bourgeoisie joined the FSLN and participated in government and in state ministries. Vilas (1992) has shown how members of the families of the landed and business elite obtained positions of power within the new state or within nationalised state industries . He notes for example how the chairman of the Central Bank, members of the Council on Internal Affairs, Deputy Minister of the Interior, chairman of the National Finance System, the Minister of Foreign Trade, the Minister of Budget and Planning, members of the directorate of INRA Nicaraguan Institute for Agrarian Reform, MIDINRA (Agricultural Ministry), the head of the economically vital *Flor de Caña* rum factory and San Antonio sugar mill, and of course representatives of the National Directorate (the FSLN's ruling body) were members of long established, landed and business families. In all, Vilas identifies almost one hundred deputy ministers, director generals and managers with links to the agrarian bourgeoisie. Vilas argues that their positions enabled the agrarian bourgeoisie to influence state policy and in particular the design of the Sandinista Agrarian Reform (SAR).

For example, the San Antonio sugar mill in particular, Vilas (1992: 329) suggests, acted as a “*business management school*” for technicians and professionals who later became high-ranking members of the government. These ‘San Antonio technocrats’ were decisive in forming the policies of the SAR, instilling, as Baumeister (1988) argues, the SAR with a big-business outlook. The influence of these technocrats is shown in the policy implementation with the SAR Vilas (1992) suggests that the SAR's emphasis on large-scale farms, technology-intensive investments, agro-export production and slow distribution of land to campesinos is indicative of their influence. Vilas argues that they combined a belief in entrepreneurial efficiency with a distrust in campesinos as being synonymous with backwardness. As one campesino explained;

“small producers are seen as consumers not as producers, as someone who is always demanding of the government, that they want loans all of the time”

(pers. com., Fieldwork 1998)

While the SAR distributed a large amount of agricultural land to the state it is important to realise that the greatest part of these confiscations came from the lands of the Somoza family and its closest associates and that a significant proportion of the agricultural bourgeoisie were largely untouched by this reform. When, during the mid-1980s, land was redistributed to small producers, it was done so from state enterprises and not private land owners. The influence of the agrarian bourgeoisie in directing SAR policy cannot be discounted in affecting this policy.

The effect on the SAR is important because of the impact which agricultural strategies have had on environmental conditions. The influence of the agrarian bourgeoisie in government and the continuing belief in the efficiency of the large estates resulted in narrow agricultural policies which meant that opportunities to introduce small-scale, environmentally-sensitive agriculture was severely limited. The failure of the FLSN to fully adopt an environmental perspective to development, weakened the environmental programme and made its dismantling easier. Within the government there was some recognition of the need for sustainable development and environmental protection, but these concepts never became part of a wider development policy, preventing the wide-scale transformation of environmental conditions. As EPOCA (1990) suggests ;

“the dominant ideology of industrialised high-tech, large-scale development, was the driving force in forming the government’s plans to lift the country out of poverty.”

Leading EPOCA to conclude that:

“the government’s lack of a comprehensive understanding of environmental and natural resource protection inhibited such a transformation.”

And as the environmentalist Bill Hall argues;

“The ecological vision [of the FSLN] has respect, but it’s not total. There is conflict and controversy over the role of ecological consciousness in development”

(Norsworthy and Barry 1990)

Perhaps more significantly the limitations of Sandinista environmental commitment and policy is illustrated by Guadalupe Sanchez-Blandon, the FSLN’s representative on the Environment Commission (Comision de Ambiental Natural) of the National Assembly;

“The Frente has had little interest in the environment, it’s not part of their agenda. Under Sandinismo, laws were introduced to protect the environment. Also big businesses who were logging left Nicaragua. But there was a focus on forestry, there wasn’t a global view of the whole biodiversity. The programmes introduced did to some extent protect the environment but only in a limited way.

(pers. com, Fieldwork 1998)

The approach of the FSLN towards the environment question, prevented the environment from becoming a core area of policy and also allowed contradictory policies to develop, with different ministries following opposing policies on the environment (Faber 1993). The direction which the SAR took was also highly significant. Large numbers of large landowners were allowed, and indeed encouraged to continue production practices that were environmentally degrading. The distribution of lands through the SAR to small producers was as Collins et. al. (1986) have

suggested, inadequate to meet the demands of this sector. By the time land and resources had begun to reach small producers, the infrastructure of the environment programme had all but disappeared, preventing the participation of small producers in environmental renewal and protection. The current development of alternative agricultural strategies being undertaken by campesino organisations suggests that the potential for campesinos sustainable agricultural practices was neither fully appreciated nor acted upon under *Sandinismo*.

The power and wealth which the agrarian bourgeoisie were able to retain during the revolution, has been consolidated and increased in the post revolutionary era of the 1990s. The consequences for the poor and the environment has been an intensification of the problems which the revolution sought to address in 1979.

4.0 The 1990s: The Re-Concentration of Power and Resources

The importance of the SAR should not be underestimated. It is quite rightly described as the most extensive agrarian reform programme to have affected Central America. Some 108,000 peasant families receiving land as a result of it (Nitlapan Team 1994) and the power and land holdings of the agrarian bourgeoisie was diminished. However, the 1990s has seen the re-concentration of power and resources into the hands of the agrarian bourgeoisie as a direct result of the policies of the post-revolutionary governments of Violetta Chamorro (1990-1996) and Arnaldo Aleman (1996-).

This process of re-accumulation seems certain to limit opportunities for the development of national strategies for environmental protection. While the state continues to issue policy declarations on the environment and sustainability, that same state has also issued extensive forest logging and mining concessions, promotes the expansion and intensification of agro-export production, supports the wide-spread use of chemical pesticides, fails to enforce environmental legislation and has done little if anything to support local environmental initiatives. The Nicaraguan state has returned to the hands of the agrarian bourgeoisie. The interests of this political elite remain fixed in maintaining profits, regardless of the environmental consequences and they seem intent in using the apparatus of the state to maintain and strengthen their position.

The Return of the Agrarian Bourgeoisie

The current confiscations of lands given to peasant producers during the SAR, and the reform under the Chamorro government are significant. The agrarian reform under Chamorro resulted not in the redistribution of lands from large to small producers but in the break up of state enterprises. In effect this was, as Jonakin (1997) has noted, the fulfilment of one peasant's demands at the expense of another. Under the Aleman presidency, the re-concentration of lands to the agrarian bourgeoisie has intensified. Research suggests that that for each large owner who has had land returned, it is at the expense of an average of 32 families (Castillo 1997) The Aleman government has, according to Castillo (1997), accommodated the claims of *Somocistas* who have demanded the return of their properties, by attacking the co-operatives and by using the legal apparatus to confiscate the lands of reform beneficiaries. As campesinos explained;

“during the break-up of the co-operative we were menaced by people paid by the rich. We sold up and went on as individuals.” (pers. com., Fieldwork 1998)

It is difficult for small producers to afford the legal costs to either gain titles or to defend their land. In effect, large land owners have picked off small owners with scarce resources. Jonakin (1997), has shown that the majority of land is being bought by large owners with the bulk of transfers being under 50 hectares, representing transfers of land from the SAR sector that was previously controlled or accessed by peasants. It is a return to *Somocismo* without Somoza.

Uncertainties of property titling have made these confiscations easier for the state. Many of the beneficiaries of the agrarian reform still have no legal land titles as under the SAR, much of the land give to producers was not legally registered. According to Dumazert (1995), the further redistribution of state lands and ill thought-out legislation under Chamorro only served to further complicate the problem. The consequences have been to leave seventy-one per cent of beneficiaries involved in land disputes over ownership and titling. Under the Aleman government, laws relating to property reform have, where it suited the present government, been ignored in order to favour the re-appropriation of lands by former large land owners. This includes Laws 85, 86, 88 introduced by the outgoing Sandinista government, the Chamorro privatisation decrees 344 and 351 which allowed parts of state enterprises to remain in hands of workers, and parts of Law 209 which validated the land distribution to small producers during the 1980s and 1990s. Former *Somocistas*, again with the support the government, have also used the Helms-Burton proposal in the US to regain land. The proposal demands the return of property formally owned by these ‘naturalised’ US citizens despite the fact that only 170 of the 2000 claimants were US citizens in 1979 (Dumartz 1995).

The power which the Aleman state wields, in the face of little effective opposition, has enabled it to carry many of its policies on the land issue through. As some commentators have suggested, the FSLN’s ‘dialogue’ with the Aleman government is in many respects a co-opting of the FSLN to the agenda of the right, leaving the poor with little effective representative voice in government. In addition, the signing over of state lands to FSLN members in the last days of the Sandinista state has also created a new landed elite within the FLSN itself. As Castillo (1997) suggests, these new landowners in the FSLN and the old agrarian bourgeoisie see their interests as being aligned.

In many respects the fundamental problems of unequal land, resource and power distribution, which limit the opportunities to confront and resolve environmental degradation remain firmly entrenched in Nicaragua. These problems are continuing to push peasant producers into irrational and unecological practices as they are forced to over use their land. In some cases, under the threat of land confiscations, peasants have resorted to more drastic measures. As Melvin Castrillo, a Nicaragua agronomist relates;

Two years ago in Jinotega, a co-operative was broken up by large landowners. The campesinos burnt and poisoned the land. I saw the effects of the wind on the soil and the dry rivers. Since then,

people have been killed and the police called in. The co-operative was dismembered with people fighting over land as the price of land went up.

(Pers. com., fieldwork 1998)

A Continuing Decline into Poverty

Since 1990, Nicaragua has become an increasingly indebted and pauperised country. The effects of the Contra war and economic embargo in the 1980s, the public spending cuts resulting from the IMF instigated structural adjustment programme, unemployment as a consequence of privatisation of state assets and the appropriation of reform beneficiaries lands have all contributed to the pressures being placed on the county's poorest citizens. The United Nations rates Nicaragua as the poorest country in Central America, and the second poorest in Latin America. Nicaraguan's now have the lowest life expectancy in Central America with some 12.4 per cent of the population dying before the age of forty. Forty-six per cent of adults did not get higher than fourth grade education, and forty-three per cent exist on less than one US dollar per day (UNDP 1999)

The consequences of the social and economic pressures upon the poor has seen large numbers of distress sales as peasants are forced to sell their land. The economic pressures of limited access to land to the poor and the effect of forestry felling concessions given by the state, has been to see deforestation rates rise to 150,000 hectares per year, as high as any time since the 1960s. In addition some 7.7million hectares of land are in a state of erosion & deterioration (Nitlapan Team 1996). Environmental systems are deteriorating and being degraded, processes which are endangering the minimum conditions for survival.

Access to Resources

Not only have small producers seen their lands threatened but they have once again been unable to command access to resources in the same way that larger land owners have. Budget tightening in the face of structural adjustment policies has meant a drop in agricultural loans with small and medium produces less able to obtain loans and priority given to large farms. The loss of the development bank BANADES further exacerbated this problem. However, as Jonakin (1997) notes, even before BANADES' demise one study was led to conclude that "*[BANADES] is not a development bank, it is not even a bank. It lends huge amounts to large-scale producers based on friendship mixed with political criteria*".

The formal mechanisms of the system have seldom benefited small producers where the state and the banking system has almost always favoured large producers in the question of access to credit and resources. Large land owners are using credit and loans to develop extensive cattle ranching, and cotton production with all the associated environmental problems. As Stanfield (1995) notes, these production systems are heavily geared towards short-term profit maximisation with resulting environmental damage. The use of scarce economic resources in this way has according to the Nitlapan Team (1994), wasted the advantages that more efficient small could farmers bring.

Small Producers desperately need credit and financial support for the improvement of their lands. Ecological improvements including soil conservation, reforestation and the development of sustainable agricultural practices all require capital investment and long-term security of tenure, two factors which are most evidently missing at the present.

Despite this, small and medium producers continue to out perform their larger neighbours in term of their contribution the export production, farm efficiency and in their limited impact on the environment. According to Marchetti & Maldidier (1996) peasant farmers, at forty-eight per cent of overall farm production, produce more wealth than either of the two other parts of the sectors of farm businesses (thirty-five per cent) and individual farmers (seventeen per cent). Large businesses are also less efficient, with every \$1.00 of investment generating only \$1.14 in return. By comparison, these researchers argue, peasant producers return almost \$2.50 for every \$1.00. The impact on the environment of peasant practices is also argued to be less destructive. Peasant farmers do not use the same volume of chemical inputs, they do not use high cost, high impact machinery and their overall rationale in relation to their land is more environmentally sympathetic.

Local Environmental Initiatives

While some local communities are attempting to introduce environmental measures to protect their land, peasant producers have explained the difficulties of introducing conservation measures on land they do not own.

“Well, you work on that land for a year and then maybe they wouldn’t let you rent it again and you have to look elsewhere. You can’t do things on the land without permission.”

(pers. com., Fieldwork 1998)

“It would be difficult, it’s not worth the effort because it’s not you own land.”

(pers. com., Fieldwork 1998)

“people don’t have land that is their own. If you are renting and you improve your land then you would say that the work is lost because you might not be able to work it again.”

(pers. com., Fieldwork 1998)

The current unstable situation is, according to Stanfield (1994), contributing to a decline in savings, import-export imbalance, unemployment and increased debts because of the inability of producers to confidently invest in their holdings. Current property markets, where land prices can be three or four times lower than what would be expected (Jonakin 1997) are favouring the rich. As Stanfield suggests,

“the effective exclusion of small and medium producers from this markets and the limiting of participation to local elites, will produce a trend towards the re-concentration of the land, and the initiation of another cycle of exclusion, expulsion and social conflict”. (1994:5).

Recent field work has also revealed that local environmental initiatives are being constrained by these issues over land. The testimonies given above are from peasant producers living in the San Dionisio area of Matagalpa region. Here local projects are attempting to introduce sustainable agriculture to peasant producers but are limited in the degree of their participation by issues around land ownership and access to credit. Field work revealed that those producers who do not own the land they farm cannot introduce essential measures such as soil conservation, or reforestation.

Land poor farmers also often lack the time to participate in the programme as there is a need to spend a proportionally high degree of time engaged in agricultural labour. Other producers are unable to provide the necessary title deeds or livestock which are regularly required for obtaining credit from the programme. As one official of the Campesino-a-Campesino programme admitted;

“ The Programme is limited by lack of credit. When the credit is being distributed, if someone is poor and they aren't able to pay it back, they aren't given credit. The really poor don't get much help. Because the Programme is poor it can't help the really poor. This year only the promoters got credit, not the producers” (pers. com., Fieldwork 1998)

Buying land is becoming increasingly difficult in a market where land prices are rising (Nitlapan Team 1999) and where money to purchase amongst the rural poor is in short supply. Those without land must work as agricultural labourers. With agricultural wages in 1998 standing at around one US dollar per day and with land prices at between one hundred and three hundred US dollars per manzana (pers. com., Fieldwork 1998) it is difficult to see how landless peasants can possibly purchase the land they require. Even when campesinos have land and are able to grow surpluses to sell, the prices they can command are woefully low. Without resources to store produce, they must sell soon after harvest - precisely the time that small other farmers are also selling. Consequently, the prices obtained are driven down by over-supply. The winners in this are the large producers who can afford to wait until prices rise and the middle-men, the *comerciales*, who buy the produce, store it until the end of the growing season and sell it at inflated prices when supplies are depressed. Small farmers are in a poverty trap that can force them to sell their land to larger neighbours or to overuse it in an attempt to survive. Under these conditions, non-landowners or those with very small holdings or without land titles have difficulty in making long-term commitments to land management or of taking up or fully participating in the agro-environmental projects currently operating.

Local disputes over land and the actions of large landowners are also creating problems for these initiatives. In the area under study, three important water sheds were under threat from deforestation. Lands previously held by co-operatives and state farms had been acquired by large private owners. These new landowners were seeking to remove the trees and graze cattle, a move that was endangering local water supplies and peasant holdings. Attempts by local communities to buy the threatened areas was made almost impossible by the cost of the land and the legal fees required in securing the sales. Other incidents of large land owners removing trees for cattle ranching were also related.

Access to basic resources, such as water, severely restrict the scope of these initiatives. Some community members, engaged in reforestation projects with agro-environmental programmes, have been unable to successfully plant trees because of this.

“We planted two thousand [saplings] but we lost most because it’s so dry. Now we are just planting around the wells” (Pers. Com., Fieldwork 1998).

The opportunities which these local environmental programmes present are being restricted and undermined by inequalities of resource ownership and access to credit. Communities are left to largely fend for themselves without the resources to adequately resolve many of these problems. While, as Marin (1996) suggests, there is *‘inadequate state support for sustainable agriculture’*.

Consequently, these communities remain highly restricted in their ability to improve their local environments and protect them against adverse conditions. Local issues over access to land and resources are compounded by national inertia over environmental protection and social justice and international pressures from international financial institutions which seek to open up Nicaragua’s natural resources for exploitation and to further restrict the effectiveness of the state. As the events of 1998 showed, when intense natural phenomena arise, the fragile conditions of the poor and the environment which these socio-political processes have produced are revealed.

Hurricane Mitch

When hurricane Mitch hit Nicaragua in October 1998 the devastation it caused was testimony not so much to the power of natural elements but to the legacy of decades of environmental degradation and continuing inequalities between the rich and poor. Of the more than 2,500 people who were killed, the vast majority were the poor of urban and rural areas, made vulnerable by these inequalities and inappropriate land-use.

The expansion of agro-export production from the 1950s destroyed upland forests, degraded soils and altered drainage patterns. Peasant families were displaced to fragile upland environments. Here, lack of adequate land and insecurity had forced them to over-sue the land, leaving it susceptible to adverse weather conditions. As Aleman (1999), relating the situation in Terrabona in the north of the country; suggests;

‘the land ... most of which belongs to large land owners, is fertile, while, in the hills, large numbers of small peasant farmers are squeezing into what little they can of the poor, eroded soil. The issue of land and its equitable distribution was the main problem in Terrabona before the advent of Mitch’.

It is the concentration of land and resources, and the power which the economic and political elite continues to wield in order to maintain these inequalities, which is the root cause of this so called natural disaster. As Rocha (1999) suggests, these processes of land accumulation and environmental degradation created a high level of social and environmental vulnerability, leaving the population and natural environment open. In the upland areas, over ninety percent of the bean harvests of peasant producers were

destroyed by the hurricane (Aleman 1999). To add insult to injury, erosion from poor upland plots saw millions of tons of top-soil washed down into the valleys and onto the land of large producers, ruining the land of the poor and fertilising that of the rich.

The response of the Nicaraguan government has been to define Mitch as an unavoidable natural disaster, ignoring the political and economic inequalities which underpin the effects and leading as Brown (1999) suggests, to the state to instead, concentrate on the reconstruction and rebuilding of what already existed. The reconstruction of infrastructure is a response to the disaster which avoids uneasy political questions about who owns the resources of a country and who wields the power to maintain that ownership. The post-1990 governments' responses to the wider environmental crisis facing Nicaragua (of which Mitch is just the most recent example) has been to produce numerous policy documents and to sign conventions on development and the environment. Where for example, is the government's response to its commitment to deliver on the Stockholm Convention's aim to 'reduce the social and ecological vulnerability of the region, as the overriding goal' ? While the state signs these documents it has at the same time, intensified the inequalities of resource ownership, pursued environmental degrading agricultural policies, failed to engage the poor in development and environmental protection and largely failed to implement or enforce its own environmental objectives. The conclusions that are drawn is that development strategy of the state has no ecological rationale. Twenty years on from the revolution, the people of Nicaragua are still waiting for social and ecological justice.

Opportunities for Change

With the limitations of the current state's commitment to environmental protection and its inability to address issues of inequality, what prospects are there for the environment? While Nicaragua continues to have highly unequal land distribution, the SAR did ameliorate these inequalities, creating a significant number of small producers. According to some commentators, within the region, only Nicaragua has opportunity for widespread and sustained equitable economic development because of the advances in land distribution made during the 1980s (Nitlapan Team 1994). Releasing land to small producers who might be able to provide the necessary agricultural output whilst minimising environmental degradation was an opportunity which was never realised during the revolution. It is a question now of releasing the potential of these small producers which has effectively stagnated since 1983.

As Marchetti & Malvidier (1996) suggest, peasants make up the social force with the greatest economic and productive potential to organise Nicaragua's agricultural sector. The plethora of local environmental initiatives which have spread since the late 1980s, indicates that there is great potential within local producers for ecological as well as economic development. Peasant producers combine high productive rates with, as Faber (1993) Marin (1996), Marchetti & Malvidier (1996) and Rocha (1999) have argued, low environmental impacts. But to realise this potential, they require support and a political infrastructure that will both address inequalities and regulate agricultural practices towards sustainability and away from short-termism. Programmes like *Campesino-A-Campesino* (Nielsen 1995, Holt-Gimenez, 1996, Holt-Gimenez and Cruz-Mora 1997, Scarborough 1997) for example, are utilising the knowledge of peasants to renew local environments but are restricted by wider political and

economic constraints. The local sector is playing its part, with communities attempting to address the problems facing them, it now requires the state and international agencies to support positive environmental practices.

While successive governments have been unable or unwilling to implement effective environmental strategies in the past the role of the state in achieving this remains essential. The problems faced are so extensive that only national and indeed international approaches can truly hope to address them. But conversely, the participation of local communities and the democratisation and decentralisation of environmental protection must also be included in any approach.

Conclusions

Underlying the social and environmental problems that Nicaragua faces is the issue of the inequalities of resource ownership. Political and comic elites have used their power to exploit the environment and its people and to forestall change. It is power and wealth, and its distribution and use which are at the heart of the matter. The unequal distribution of these resources and power represents constraints which have meant that there has so far been a failure to introduce effective environmental practices in Nicaragua.

During the revolution, important attempts were made to address these problems. In the case of the environment, these measures largely failed. A combination of dire economic conditions, a lack of commitment by the FSLN towards the environment and the ability of the agrarian bourgeoisie to largely maintain existing development strategies towards agriculture, effectively curtailed the environment programme. In the 1990s, many of the advances of the revolution have been pushed back as *Somocistas* regain 'their' lands and the inequalities of resource distribution intensify. When hurricane Mitch unleashed itself upon Nicaragua in October 1998, the true causes of environmental degradation were there to be seen by anyone who wished to look. In order to begin to deal with environmental degradation the land issue must be addressed, not only to allow the poor the land they need but to resolve the multitude of disputes currently raging over land. The Nitlapan Team (1995) estimate that some seventy per cent of land disputes could be resolved by accepting the legality of the Sandinista and Chamorro government agrarian reforms.

The government of Nicaragua however, has chosen not to address these issues, little wonder, given the effects that confronting the real causes of the problem would have on a state currently dominated by large business and landowners interests. While successive governments have been unable or unwilling to implement effective environmental strategies in the past, the role of the state in achieving this remains essential. The problems faced are so extensive that only national and indeed international strategies can truly hope to address them. But conversely, the participation of local communities and the democratisation and decentralisation of environmental protection also seems vital to any new initiatives. The lessons of the past indicate that leaving the protection of the environment and of the poor to the political and economic elite is not an option.

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