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Infrastructure for the Poor : The Case of Brasilia

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ABSTRACT

The issue of infrastructure for low-income settlements cannot be reduced to technical solutions. In this article it is argued that a broader view of infrastructure needs to include its place in housing development of the poor, and its connections with the socio-political processes.

The consolidation of low income residential areas in Brasilia has depended mostly on the communities' struggles for provision of basic infrastructure, in particular, sanitation. The attitude of different government agencies regarding servicing irregular settlements, their irresponsible choice of technology, and the health hazards of the present situation, are some of the main components which are linked to the infrastructure issue, and discussed for the case of Brasilia.

Background

During the fifties the concept of modernization of Brazilian society through an increase in industrialization and regional development gained strength.

The decision to shift the national capital from Rio de Janeiro to the highlands of central Brazil materialized as it was inserted in the broad political programme of Juscelino Kubitschek who was elected President in the midfifties. Twenty-six projects were presented at a national competition. The work submitted by architect Lucio Costa, known as the 'Plano Piloto de Brasilia', was awarded the contract and construction began in 1956.

A network of labour camp type of accommodation was set up by the Government and by building contractors responsible for the different projects.

Thousands of workers, traders, technical staff, and so on, marched towards the site of the enterprise in the early years and on 21 April 1960 the capital was officially inaugurated.

Urban context

According to Costa's Plano Piloto the city was expected to reach a target population of 500,000 in twenty-five years' time, maintaining its unique

characteristics as a tertiary city, the seat of the national Government, and the nucleus for regional development.

Surprisingly the population reached the figure of 1,579,000 in 1985, which came to more than three times the number estimated by the initial plan. The city's population growth rate ranked the highest among all Brazilian state capitals in the last decade, jumping from a mere 140,165 inhabitants in 1960 to 537,492 inhabitants in 1970 and to a phenomenally high figure of 1,198,1 2 inhabitants in 1980.

This incredible growth can be explained by several factors related to the socio-political and economic situation in the country and by other local and regional policies towards urban and rural land, housing, facilities and services, and so on.

The existence of low income settlements (labour camps—*acampamentos* and squatter settlements—*invasoes*) within the urban framework of the new capital was not acceptable to the planning team and several of them were bulldozed off while evicted families were transferred to newly created satellite cities before the inauguration of the city. This resettlement policy continued until the end of the seventies creating in the process, other satellite cities but not effectively able to solve the dilemma of housing the poor, as several settlements still remained under consolidation processes by the residents' own efforts, despite strict Government control over them.

By the end of the seventies with the implementation of the first city's master plan PEOT,* the total area of the federal district (5771 sq. km.) had already eight satellite cities consolidated (Nucleo Bandeirante, Taguatinga, Ceilandia, Brazlandia, Gama, Guara, Sobradinho and Planaltina), and a planned one called Samambaia whose implementation started in 1985.

During the eighties a small shift in state housing policies has taken place and a low income housing programme has been set up to meet the needs of the poorest groups, those living in the illegal settlements (*invasoes* and *acampamentos*).

A census was carried out in 1983, eighty-nine settlements were mapped and 17,366 families were registered, an estimated number of 86,830 inhabitants.

But despite sectoral efforts during different periods of the city's life, thirty-one years after construction began, the state has failed to provide

*PEOT : Plano de Expansaoe Organizacao Territorial do Distrito Federal, a master plan approved in 1977 which defined a series of regulations towards land use and urban development in the whole territory of the Federal District of Brasilia.

housing alternatives to the many different economic sectors with the poorest ones facing the most critical situations within satellite cities and in the illegal settlements.

The over-occupation of residential plots in the satellite cities has caused a new type of housing to emerge where the tenants (*Inquilinos* de Fundo de Lote) occupy rooms/houses in backyards of plots, share services and sanitation facilities and pay very high rents. Recent numbers officially estimated by the local government point to more than 60,000 families in this situation.

In addition, there are families still living in illegal settlements, bringing up the total to 100,000 low income families under critical housing conditions in the Brazilian capital.

The role of infrastructure

Housing, as a key issue in the field of urban development, undoubtedly means far more than the mere plot or the shelter provided. In a broader definition of the term it means the existing conditions under which the people can meet their needs and develop their abilities in human society.

These conditions are determined by the level of provision of services and infrastructure, that is to say, the existing accessibility to clean water, sanitation and garbage disposal facilities, electricity, transport, roads and drainage systems, education and health facilities, working places, public facilities and recreation.

In an urban context, the levels of provision of infrastructure commonly reveal the socio-economic characteristics of different neighbourhoods and the balance of power among political forces within the state mechanisms. This will directly affect the extent to which infrastructure improvements are acquired by a specific group for a particular area which in its turn determines the lines along which spatial segregation takes place in an urban area. Very often this role of infrastructure has been undervalued in recent articles and publications.

> The two major considerations which guided past studies on infrastructure-related issues were those of the public health and techno-economic components. The former, advocated by the medical profession, assesses the performance of infrastructure provision on the basis of sanitation and hygiene, aiming not only at the reduction, but the total elimination of disease vectors transmitted through water, and untreated human and solid waste.
>
> Techno-economic considerations comprise recent innovations for

> infrastructure systems and equipment . . . ranging from improvement of village wells and pit latrines to small-scale composting plants and methods of controlling evaporation from water dams.[1]

Motivated by the idea that infrastructure cannot be simplified to technical solutions, rather it should be looked at in a broader view in order to capture its socio-political components, this problem in the city of Brasilia is studied in such a way as to understand its real task in a new city planned wholly by the Brazilian state that has invested millions of dollars to make its political project a feasible enterprise.

> Only during the year 1958, US$8,906,191.00 were spent in the supply of different materials, metallic structures, equipments, etc. . ., amount originated from the US$ 10,000,000.00 loan obtained by Urbanization Company of the Capital (NOVACAP) at the export and import bank . . . at the same year, US$ 4,113,106.00 should be added to this amount due to other international operations of long term loans to buy equipments and materials.[2]

Different approaches

There are different approaches to understanding urban development policies concerned with the provision of infrastructure. Nowadays it is not only the organized neighbourhoods that are agitating for the implementation of infrastructure services: national and local governments and "international agencies are strongly recommending very pragmatic policies for tackling the basic necessities of the poor in the third world . . . generally considered as a first priority even if reducing the standards for a minimum limit, just enough to grant physical integrity".[3]

A traditional marxist approach would bring us to the conclusion that infrastructure is a necessary item for production and reproduction of capital in as much as it facilitates the maintenance of a stage of labour reproduction in marginal areas, increasing both the consumption of modern goods and the development of the capitalistic process of accumulation.

"Harvey (1978) identified two different dimensions of the built environment : for reproduction and for consumption. Both of them are essential for the general process of capitalistic production, the former being related to the material conditions for production, and the latter to the material conditions for consumption.

"Many items of the built environment may be both related to production and consumption and in the development of infrastructure is where these overlappings happen more frequently".[4]

For example, the existing supply of water, electricity, transport, sewerage and accessibility to other urban services in a particular low income neighbourhood might improve general living standards. However, it creates a differential land taxation which increases housing exchange values, transforms housing into an attractive capital good that will favour social mobility. This social mobility will affect the possibilities of access to commodities and cause a well-defined segregation in landuse.

Another classic example would be the one that considers the supply of electric energy as a means to favour not only consumption of electric household goods but also the ideological reproduction of the capitalistic system through the mass media (radio and TV broadcasting).

> Housing is a mean of subsistence that is necessary for the reproduction of the labour force and is therefore a good whose cost enters directly or indirectly into the production of all commodities.[5]

The approach that considers infrastructure as a key issue for the improvement of health and living conditions in low income residential areas, with direct impact over environmental systems, has been assumed by both national and local governments and international agencies. On the one hand, governments that apply policies based on this approach have a clear objective which is not to make this social service available for all, but to maintain the strategic equilibrium of political forces within society since they usually provide leverage for dominant political groups to achieve their goals.

On the other hand, international agencies, collaborating with national governments have come to emphasize these policies through ample financial support that sustains, at the same time, the international balance of power and the international dependency and domination systems established between developing and developed countries.

"In his address to the Board of Governors of the World Bank at the 1978 Annual Meeting Mr. McNamara stated that, in order to achieve the twin objectives of growth and equity, countries must modify the pattern of growth so as to raise the productivity of the poor, and also improve the access of the poor to essential public services".[6]

"The international funders thus see slum improvement as potentially bringing slum property into the formal housing market, encouraging ownership and strengthening the market mechanisms.

"Stressing the economic justification for investments in slum infrastruc-

ture, they insist on a radical reduction of subsidies to low income people, and put a heavy emphasis on cost recovery from beneficiaries.

"From their point of view, the provision of infrastructure in slums and squatter areas is a key component of the new international paradigm for low cost human settlements development in the cities of developing countries".[7]

Infrastructure for the poor

What are the theoretical tools needed for those who experience in their everyday life the harassment and difficulties that arise out of the inadequate provision of infrastructure or at times even a complete lack of such an important key to urban development?

One is tempted to agree with Carlos Nelson F. Santos in his foreword, ". . . when people are being expelled from their houses or from their neighbourhoods, it's useless to tell them to read *The Capital* or the Bible"[8] (Quoted by Karl Klushspies at a conference in Rio de Janeiro/1978).

They have none of the theoretical insight but in practice they know they are victims of the existing exploitative system. It is against such exigent situations that they have established, through their organizations, a way to struggle for the benefits of urban life.

It is specially here that infrastructure plays an important role serving as a rallying point for people in a particular neighbourhood in a common cause, for example, water supply. This will directly affect their organization and will consequently increase the interaction among individuals and/or families, which is so vital in presenting a united front against the threats and constraints they face in the consolidation of their settlements.

"The development of infrastructure in slums and squatter areas is an important issue around which the community can be organized and strengthened. The quest for improved infrastructure is a quest for social justice . . . while individual slum dwellers can accomplish nothing in this respect, an organized community can. Together, slum people can draw attention to their needs. Since infrastructure services are a common need, the struggle for obtaining them is seen as an important struggle that can unite the community around a common goal".[9]

The role of infrastructure in Brasilia

In Brasilia, the provision of infrastructure has been a means used for the residential segregation of different socio-economic groups/classes by various governments through the years, which have favoured the Plano Piloto.

Rather than implement a policy on a basis of quality that would allow the satellite cities to achieve a reasonable level of infrastructure, governments have perpetuated a process of segregation of the majority of the population. Ceilandia alone, for example, the most populous satellite city, has more inhabitants than the Plano Piloto but has a per capita annual income that is six times less than the latter (see Table 1) and suffers from a lack of public services and facilities of all kinds.

The Plano Piloto centralizes also the provision of basic urban facilities such as hospitals, schools, job opportunities and public recreation installations.

The scale of provision of water supply and sanitation to one of the highest per capita income residential areas in Brazil, reveals the priority in public investment that has been given to it. Being the seat of the local and national government one can expect such a situation but probably not on such a scale.

"Concerning the water supply system, the Plano Piloto has for its use 85% of the total quantity of potable water distributed in the federal district. During 1970-76, this central locality, despite its very low population growth compared to the other urban areas, was the only one to have the capacity of its reservoirs raised, while the others remained unchanged.

"With regard to sewerage system, only 20% of the total households served by water borne network are found outside the Plano Piloto (62% of the connections) and Guara (8%) though apparently in all other localities there are sewer collectors allocated.

According to Peot (1977) the Plano Piloto has 90% of its area served by sewerage network, followed by Sobradinho 66%, Nucleo Bandeirante 30%, Gama 25%, Planaltina, e Taguatinga 20%, Ceilandia 10%, and Brazlandia 0% (Zero)".[10]

According to Table 2 the situation in 1976 for the federal district was roughly resumed to 70 per cent of the population served by piped water supply and 50% connected to the sewerage system.

Six years later, in 1982, according to the annual statistics publication of the government of the federal district, from the total of 293,526 households nearly 20 per cent or 58,705 households were sharing sanitation facilities or simply were in lack of them which means that about 270,000 people were living under hazardous sanitation conditions. According to Instituto Brasileiro de Geografia e Estatistica (IBGE), the average number of persons per household in the federal district is five (see Table 3).

From Table 1, based on the same governmental publication, Brasilia (including the Plano Piloto, Cruzeiro and Guara) had in 1980, twice the

TABLE 1 : **Demonstration of infrastructure in Brasilia (1980)**

Locality	*Number of inhabitants*	*Number of households*	*Number of households served by piped water supply*	*Sewage : Extension of the system (mts)*	*Number of households served by sewage system*	*Annual income per capita (Cr)***
Federal district	1,198,142	280,120	199,416	1,073,731	138,953	97,390
Plano Piloto	280,763	—	—	—	—	225,210
Cruzeiro	36,573	—	—	—	—	—
Guara	84,627	—	—	—	—	105,628
Brasilia*	401,963	—	86,609	583,063	109,796	—
Nucleo Bandeirante	17,527	—	2,939	25,132	807	66,496
Taguatinga/Ceilandia	483,129	—	73,535	238,781	12,544	—
Taguatinga	196,982	—	—	—	—	74,057
Ceilandia	286,147	—	—	—	—	35,715
Gama	135,464	—	19,582	25,630	6,095	44,415
Sobradinho	63,163	—	8,461	115,748	8,407	51,113
Planaltina	40,080	—	5,458	35,377	1,304	36,338
Brazlandia	18,820	—	2,832	0	0	31,980

*It includes the Plano Piloto, Cruzeiro and Guara.
**US $1.00 equals 3,184.00 Cr.

Source : IBGE, 1985 and CODEPLAN 1983.

TABLE 2 : **Federal district of Brasilia : sanitation conditions of the population (1976)**

Specifications	*Number of households*	*Number of people*	*Persons per household*	*Percentage from the total population*
Water supply				
With piped water supply	110,293	559,091	5.06	73.8
Without piped water supply	40,096	197,540	1.93	26.2
Piped network in the street	21,081	104,342	4.95	13.8
No piped network in the street	19,015	93,198	4.90	12.4
Sanitation				
Connected to sewage system	83,810	417,396	4.98	55.2
Septic tanks	16,135	90,115	5.59	12.1
Without sewer system nor septic tanks	33,673	249,120	—	—
Rustic cesspit	20,964	154,478	7.37	20.5
Other type of disposal or nothing	12,709	94,642	7.45	12.2

Source : Brasilia Ideologia and Realidade/Espaco Urbano Em Questao, Projeto Editores Associados, 1984.

extent of the sewerage system of Taguatinga and Ceilandia put together, although they had eight times lower the number of households served by the system than in Brasilia, which implies that there were a reasonable number of households out of the system for one reason or another.

There are indications that the situation could be even more critical but only scientific and systematic research would be able to question the reliability of the numbers available.

From the figures presented, it is clearly evident that those suffering from inadequate provision of infrastructure are the low income population living in the satellite cities and in the slum settlements.

While visiting the satellite cities of Sobradinho and Brazlandia, for instance, families were found complaining about the high prices they had to pay for water supply and electricity (some did not have either television sets or electric irons, household goods which usually consume more energy). The amounts they were paying equalled the prices paid by the residents of Lago Sul, a high income residential area on the shore of lake Paranoa, with plots of 800 sq. m. to 1200 sq. m. with gardens, swimming pools, and all sorts of electronic gadgets and devices.

TABLE 3 : **Federal district of Brasilia : households : main characteristics and location (1982)**

Characteristics	*Total*	*Location*	
		Urban	*Rural*
Total number of households	293,526	284,895	8,631
Type			
House	195,765	189,205	6,560
Apartment	67,081	67,081	—
Rustic	10,217	8,314	1,903
Room or other type of accommodation	20,463	20,295	168
Condition of occupation			
Private owned	140,163	137,754	2,409
Rented	95,694	95,638	56
Borrowed	55,995	49,997	5,998
Others	1,448	1,280	168
Without declaration	226	226	—
Water supply			
Public piped network	279,140	278,914	226
Wells or springs	12,315	4,246	8,069
Other types	2,071	1,735	336
Use of sanitation facilities			
Private to one household	237,056	231,171	5,885
Shared by more than one household	51,715	51,490	225
It doesn't exist	4,699	2,178	2,521
Without declaration	56	56	—
Electric energy			
It exists	286,315	281,826	4,439
It doesn't exist	7,211	3,069	4,142

Source : IBGE and CODEPLAN.

IBGE—Instituto Brasileiro de Geografia e Estatistica.

CODEPLAN—Companhia do Desenvolvimento do Plana to Central.

This leads us to another question: the cost recovery policies applied by many governmental agencies through which the poor, while being palmed off with uncertain and inadequate provisions, indirectly help finance the expansion and improvements in the higher income residential areas.

The conventional versus the poor

In Brasilia, the establishment and improvement of low income residential areas has depended mostly on the capacity of organized communities' struggles to change the trends of public policies to cater to their needs.

In the slums and squatter areas, the most critical constraint for consolidation and upgrading of the existing settlements is the lack of sanitation. This has been the main argument used by Companhia de Agua e Esgoto de Brasilia (CAESB)—the water and sanitation company of Brasilia, in defining the urban and rural residential land use.

Basically, the limitation of population and the constraints in occupying the vacant space surrounding the Plano Piloto, more specifically the Paranoa Basin—where many slums (*invasoes*) are located—are based on the existing sewerage system which is incapable of absorbing the population increase established by PEOT.

"CAESB gave effective contribution by inserting in the report (*PEOT*), properly argumented, strong environmental restrictions for the lake Paranoa Basin, establishing 728,984 inhabitants as the maximum population limit for this Basin".[11]

The arguments presented by the CAESB have been based on the conventional type of sanitation scheme, that is to say, the waterborne sewerage system with main collectors and treatment plants getting the treated effluents back to the Paranoa lake.

"The biological processes of sewerage treatment, as it is the case, are economic though sensitive to variations in the quantity and quality characteristics of the effluent. That is why it is essential that the treatment stations perform under the parameters admitted in project, until the desired performance is obtained".[12]

This system though, found its performance put to test and questioned by the increasing pollution of lake Paranoa.

Sixteen years after the foundation of the capital in 1976, the local government signed a contract of cooperation with United Nations agreed to by CAESB, WHO, the health and foreign affairs ministries in order "to develop studies and research about the Paranoa lake, under a well known advanced level of pollution".[13]

How can a twenty-six-year old lake be subjected to a de-pollution programme strictly based on the improvement of the conventional sewerage network?

Why is it necessary to implement a network in the high income and low density residential areas surrounding the lake shore where septic tanks are the efficient solution commonly used? (According to CAESB, there is a network with a pumping station planned for Lago Sul and Lago Norte residential areas to substitute for the existing system).

The hypothesis is that the conventional system failed in its task of purification and the functional structure of CAESB has not been able to implement different approaches towards sanitation.

Why then blame the "irregular" popular settlements located within the Paranoa Basin if there are no reliable data concerning the locations of supposedly illegal disposals (of sewerage, solid waste or waste water or storm water) on upstream catchment areas?

The fact is that after signing the contract, the years following were used for structural development of CAESB and professional training of employees that led to studies and propositions concluding that "(1) sanitation constitutes the main source of pollution control for the lake and (2) besides the sanitation solutions, it is essential to control the activities taking place in the hydrographic basin . . . as a tool to guarantee the renovation of the lake with water of reasonable quality".[14]

Sanitation: a major constraint

CAESB wants to control the occupation in the Basin; PEOT wants it too; different agencies related to urban development disagree among themselves; the government adopts an ambiguous stand but at the same time implements improvements in slums and squatter areas located in and out of the lake Paranoa Basin, when political and social expediency demands it.

What is left for the population of those areas is a critical health situation like the one in Vila Paranoa the most populous slum settlement in Brasilia that has the "highest mortality rate in the federal district among children under one year old (39.05 deaths per 1000)".[15]

Faced with this health situation and the hazardous water supply, sanitation facilities, and the extreme lack of other infrastructure services, the low income population have found solutions under conditions of scarce financial and physical resources.

"As the development history of many low income neighbourhoods testifies, a long process of consolidation takes place through which the

residents either develop and provide their own commonly, or pressure government agencies to supply some basic services".[16]

They have also been up against CAESB's inflexible position opposing the upgrading of their residential areas because the company views it as an unviable task due to its traditionally conceptual way of dealing with water and sanitation that is characteristic of Brasilia.

"Indeed the intricate task of inserting infrastructure into existing low income neighbourhoods, many of which are unplanned and situated on inappropriate land, calls for a departure from orthodox technologies and standards.

"However, there are less possibilities for experimental technological choices because the actual implementation is usually carried out by those municipal agencies respectively responsible for different service components in the city, and their preference is to use standard equipment to avoid future maintenance problems".[17]

The dominant infrastructure concept applied in the city tries to fit the people into a procrustean framework, of a planned city like Brasilia, instead of trying to achieve adequate solutions that would fit culturally, economically and technically the existing human settlements.

Comments made by Shlomo Angel concerning the role of the municipal engineers in infrastructure programmes and the reasons why they are reluctant to involve their agencies in slum upgrading, are applicable in the case of Brasilia:

"(1) the provision of temporary infrastructure improvements is highly problematic. They cannot be expected to develop infrastructure systems only to see them destroyed through eviction at a later date. (2) They prefer high infrastructure standards, even though they may imply considerable initial costs. Higher infrastructure standards mean lower risk of failure and less potential embarrassment, identical standards throughout the city mean equal treatment of all people in the city. (3) The project approach tends to introduce many discontinuities. It upsets agreed upon schedules and usually does not allow sufficient time for proper planning. (4) They cannot see the value of meeting people specially if this may involve confrontation. As far as they are concerned the provision of infrastructure is a technical problem, which leaves little room for people's participation in decision making".[18]

With the ongoing process of democratization in the country, the government finds it politically inexpedient to repeat slum eradication programmes. On the other hand slums and squatters residents' organizations facing problems in obtaining legal status for their settlements are

agitating for the implementation of infrastructure programmes that will help eventually to consolidate their claims. "They can expect land tenure and may be proper land titles. Beyond that, they may expect a strong organization which may be able completely to change the system of distribution of urban resources in their favour".[19]

Various experiences in Third World countries and the many documents published by the World Bank since 1978, have given rise to the issue of appropriate technology in water supply and sanitation, and the discussions towards low cost infrastructure as a key factor in slum upgrading projects.

Low cost infrastructure brought in a new trend with visible results in health improvements and environmental control in low income residential areas.

Evidence of such beneficial results should serve as an impetus for small though important shifts in actual trends in government policies towards infrastructure for the low income settlements in Brasilia, in as much as it can be spread and socialized among technicians and neighbourhood organizations.

For the people, while interactions take piace, it can represent a trump card and a tool for negotiation with governments.

"For the time being, as level of consensus among the different participants appears to be rather low, the pragmatic objectives of any particular slum upgrading project will have to emerge as a result of negotiations, whether explicit or implicit, among the different participants".[20]

NOTES AND REFERENCES

1. United Nations, ESCAP : *Improvement of Slum and Squatter Settlements, Infrastructure and Services*, Bangkok, 1984,
2. Paulo Bicca, "Brasilia : mitos e realidades", In *Brasilia Ideologia e Realidade—Espaco Urbano Questao*, Projecto Editores, Sao Paulo, 1985.
3. Ricardo Toledo Silva, *Upgrading Low Income Settlements, Discussing Issues Related to the Sao Paulo Case*, Institute for Housing Studies, Report 682, Rotterdam, 1978.
4. Silva, 1978, ibid.
5. Rod Burgess, "The limits of state self-help housing programmes", In *Development and Change*, 16. 2, 1985.
6. John M. Kalbermatten, et al., *Appropriate Technology for Water Supply Sanitation; A Summary of Technical and Economic Options*, 1, Washington, World Bank, 1980.
7. Shlomo Angel, "Upgrading Slum Infrastructure: Divergent Objectives in Search of Consensus", In *Third World Planning Review*, 5, 1, 1983.

Seigio P. Sampaio, *Problemaitica de implantacao de infra-est"utura sanitaia e aspectos de saude publica na Vila paranoaem Brasilia*, 13 Congresso Brasileiro de Eugenharia Sanitaria e ambiental, Maceio, 1985.

8. Angel, 1983, ibid.
9. F. Suely Gonzalez, "As formas concretas de segregacao residencia em Brasilia", In *Brasilia: Ideologia e realidade—espaco urbano em questao*, Projeto Editores, Sao Paulo, 1985.
10. CAESB—Companhia de Agua e Esgoto de Brasilia; *Avalicae da Expaneao demografica na Bacia hidrografica da Lago Paranoa proposicac e diretrizes sob o prisma Sanitario*, Brasilia, GDF, 1984.
11. CAESB, 1984, ibid.
12. CAESB, ibid.
13. CAESB, ibid.
14. Sampaio, 1985, op. cit.
15. United Nations, Bangkok, 1984, op. cit.
16. United Nations, ibid.
17. Angel, 1983, op. cit.
18. Angel, 1983, ibid.
19. Angel, 1983, ibid.
20. Angel, 1983, ibid.