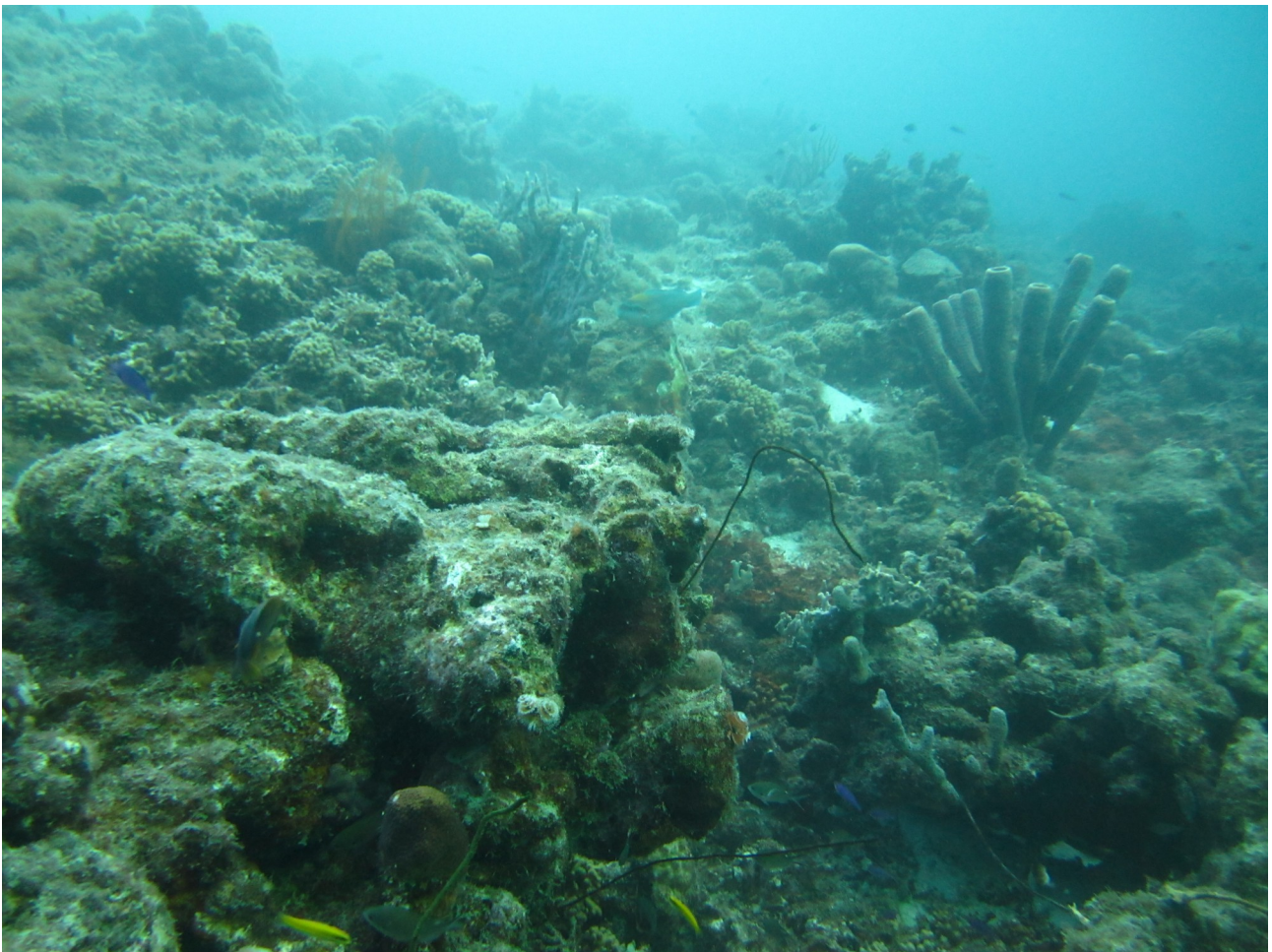




MINISTERIO DI
**SALUBRIDAT PÚBLIKO,
MEDIO AMBIENTE I NATURESA**

Environmental Policy Plan Curaçao

2016 – 2021



Samenvatting

Een gezond milieubeleid is een *conditio sine qua non* voor duurzame ontwikkeling en dient de prioriteit te hebben bij economische planning. Uitgangspunten van dit beleidsplan zijn het vaststellen van normen voor vergunningen die gebaseerd zijn op het voorkomen van gezondheidsproblemen en beneden de grens liggen van het zelfreinigingsvermogen van het milieu en daarnaast het bevorderen van de internalisatie van de milieukosten en -verantwoordelijkheid door de betreffende bedrijven door het belonen van goede milieuzorg en vice versa. Hoofdonderwerpen zijn het water beleid, met name afvalwater, afvalbeheer waaronder zwerfafval, de raffinaderij, het klimaatbeleid, wetgeving en de handhaving.

Resúmen

Un maneho di medio ambiente fuerte ta un kondishon apsoluto pa desaroyo duradero i mester di prioridat den planifikashon di ekonomia. Punta di salida di plan di maneho ta establese norma pa permit ku ta basá pa evitá problemanan ku salú i ku ta bou di e nivel di limpieza propio di medio ambiente. E otro punto di salida ta promové e internalisashon di gastu i responsabilidad ambiental di kompania dor di rekompensá bon kuido ambiental i robes pa drechi. Tema prinsipal ta maneho di awa, spesialmente awa sushi, maneho di desecho inkluyendo sushi di kaya, refineria, maneho di klima, legishon i su mantenshon.

Environmental Policy Plan Curaçao

2016-2021

Towards a sustainable future

Curaçao is an island about 66 km north of the South American mainland. The geological base is of basaltic rocks originating on the deep sea floor during the Cretaceous period (about 80 million years ago), after uplifting by the collision of the Caribbean Plate with the South American Plate, coral reefs were able to form over and around the island. The fossil reefs in the centre of the island have eroded, but around the coast they are still intact. Thus the coast is mainly formed by calcareous rocks, while in the interior basaltic rocks form the majority of formations. Around the island there is living coral reef with high biological diversity.

The climate is semi-arid with distinct dry and rainy seasons. The annual rainfall can differ greatly from year to year with an longterm average of 555 mm. The average temperature is 28° C with the normal variation of 24° C at night in January to 33° C at noon in September, in which month the exceptional temperature of 38° C has been measured. There is a mostly constant breeze from the east to north-east.

Although humans have inhabited the island for almost 5000 years, at that time there were only a few hundred people. With agriculture and immigration and trade the numbers increased; most increase happened in the last hundred years to the present number of just above 150.000. Environmental degradation is related to density of human habitation, at least if no active policy to reduce the degradation is implemented. With the high population growth environmental problems increased. First of course with the arrival of the refinery, but also by the increase in waste of which the cost for management is aggravated by littering and by the increase in building particularly on the coast.

Curaçao is an autonomous country within the Kingdom of the Netherlands and is as such itself responsible for environmental management. And with most of the constraints of a Small Island Developing State (SIDS), this is not a small feat.

Table of Contents

1.Introduction.....	2
2.Water.....	3
2.1.Sea & Saliñas.....	3
2.2.Fresh water basins, Watersheds & Groundwater.....	4
2.3.Waste water.....	4
3.Air.....	6
4.Land Use.....	6
5.Solid and hazardous waste.....	7
5.1.General waste management.....	7
5.2.Littering.....	8
5.3.Hazardous waste.....	8
6.Energy and Oil.....	9
6.1.Energy.....	9
6.2.Refinery.....	9
7.Climate Change.....	11
7.1.Mitigation.....	11
7.2.Adaptation.....	12
8.Nature.....	12
9.Laws and regulations.....	13
10.Enforcement.....	14
11.Communication & Education.....	15
12.Research.....	16
Annex.....	17

1. Introduction

A strong and effective policy on environment and natural resources is essential to attain the sustainable development aspired to in the government programme. In their 2013 report on the strategies for sustainable long term economic development in Curaçao, TAC-economics stated that environmental policy should be the first priority towards economic development.¹

A healthy environment is a foremost aspect of common interest, where actions of one influences the well-being of all and as such should be one of the prime concerns of the guardian of the common good, the government. In an ideal world no activity by a person or organization will have a negative influence on other people or the environment. However it is impossible not to have some negative influence. To a certain extend the tolerance of people and the environment will provide some leeway to deal with nuisance without too many problems, but once a threshold is passed, damage may be permanent or remediation costly. It is primarily the duty of each person or organization to avoid passing that threshold, but as often that threshold is not known for each case, it should be the government to establish public norms and if needed, enforce them.

The main principles in this policy plan are:

- to establish norms based on the self cleansing or self-depurative capacity of the environment and avoidance of health problems;
- to re-enforce the individual responsibility of people and organizations to abide by the norms²;

In exceptional cases norms may be established beyond the natural self cleansing threshold. However these cases have to be temporary and include timetables, limited and based on arguments robust enough to withstand legal court challenges. The methods of establishing norms, including the possibility of exceptions and their legal challenge, will be codified into law.

For proper implementation it is important to clearly state the goals of this policy plan with measurable expected results but also to avoid conflicting consequences. Policy instruments should be implementable and enforceable.

The Ministry of Public Health, Environment and Nature (GMN) is responsible for this policy plan, but for the implementation of most proposals other entities, both government and non-government, are needed. This might be challenging, particularly if it involves large investment. The environment will have to compete for funds with other sectors, while in general the services provided by the environment and nature, although essential for human survival, are traditionally considered to be free.

With the vulnerabilities of a Small Island Developing State (SIDS), these constraints for attaining

1 TAC, 2013. Strategies for Sustainable Long Term Economic Development in Curaçao.
http://www.taceconomics.com/tacie/2013.05.14_Curacao-Report.pdf

2 Principle 16 of the Rio Declaration (1992) concerning the internalization of environmental costs:
<http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm>

sustainable development are even more difficult, and for Curaçao even more so because as part of the Kingdom of the Netherlands, it has no direct access to International Development Aid (IDA) directed to solving the SIDS constraints. This means that on one hand more creativity and political will is needed for financing these investments, and on the other hand other sources in lieu of IDA, particularly the Global Environmental Fund (GEF), have to be identified.

In the annex a matrix is given of all projects, including time-line, budget and the other entities involved. This policy plan delineates a global policy. For several items implementation has to be detailed in a separate plan. To keep this policy plan short and readable, most of the issues which are already reasonably addressed or are trivial are not included.

To reach sustainable development a broad support is needed; or in the words of the pope: “*The urgent challenge to protect our common home includes a concern to bring the whole human family together to seek a sustainable and integral development, for we know that things can change.*”³

2. Water

Being an island in a semi-arid region, Curaçao has ample seawater, but fresh water is a limited resource.

2.1. Sea & Saliñas

Goal: Ensure that no contaminants can reach the sea directly or indirectly through the saliñas from sources under jurisdiction of Curaçao.

The sea around Curaçao is its most important natural resource. Economic uses of the sea are maritime traffic, fisheries and recreation, but as a tourist attraction and for local enjoyment. There is a small possibility of future offshore extraction of gas and oil.

Coastal habitats, primarily coral reefs, have additional importance for coastal protection, diving tourism, and science with probable discovery of special genetic resources for pharmaceutical and technical use. For this reason the fragile coral reefs around the island merit prime protection against pollutants and other causes of degradation. Although some of these causes arrive from elsewhere, most are generated on the island itself: run-off from around the island, direct influence from coastal development and seepage of waste water. Waste water, contains high amounts of nutrients like nitrates and phosphates. Corals are adapted to low nutrient rates and are in constant competition for space with algae, so a high nutrient load will cause the space to be taken over by algae. Untreated waste water will also distribute large amount of (possible pathogenic) microbes around the reef and waters used for swimming.

To avoid detrimental effects of coastal development in general, a reasonable setback space will be legally established for all new development, depending on the type of development.

Presently the Ordinance on Maritime Management⁴ is the primary legal instrument for

3 Encyclical letter Laudato Si'. http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html

4 Landsverordening van de 2de maart 2007 houdende regels inzake het beheer van de maritieme gebieden in de Nederlandse Antillen, PB 2007 nr 18

environmental management of the sea. The LBS protocol⁵ can, if implemented, be used as an additional legal instrument for the reduction of pollutants entering the sea from land.

Additionally an ordinance instituting an oil and other hazardous spills contingency plan will be enacted. The plan, which has to be regularly updated and trained, has to include a published emergency call centre, and a list of persons with their contact information to act as command and advisers ; a list of locally available equipment and contractors. The plan should be compliant to the OPRC⁶ and Oil spill protocol⁷.

Saliñas, both open and closed to the sea, are an important interface between land and sea. They filter run off to the sea and are often nursery areas for reef fish. With mangroves, sea grasses and mud bottoms they form unique communities in their own rights and are important wetlands for both migratory and local birds.

2.2. Fresh water basins, Watersheds & Groundwater

Goal: A system to optimize use of natural fresh water.

Piped water is desalinated seawater of high quality as drinking water, but too expensive to be used for agriculture and nature. Too often rainwater is immediately directed to the sea not only causing run-off problems including erosion, but also losing an important resource for agriculture and nature. In the past there was a system of series of small dams holding back water run off, but these are now often lost or neglected. It is time for watershed protection with integrated water management.

The formulation of an Integrated Fresh Water Resource Management Strategy containing policy, legislative measures, infrastructural development, administration, monitoring and education aspects, will be commissioned.

The strategy should include proposals to ensure protection of watersheds, reducing run-off to sea, reduce flooding hazards, promote rain water harvest, a ground water monitoring programme and optimal use of the fresh water resources. It should also address future problems with sea water intrusion caused by sea level rise.

As a first step, the Ministry of Traffic and Urban Planning and the Ministry of Public Health, Environment and Nature have installed a joint commission on Integrated Water Management which has to take the lead in developing a plan and provide the appropriate advice and suggestions.

A general problem which needs attention for all water bodies on the island is the innate behaviour of using water bodies, including sea, basins, saliñas and gullies as a receptacle of garbage. Clean-up, enforcement, monitoring and education are instruments to address this problem.

2.3. Waste water

Goal: reduction of direct and indirect flow of waste water to sea with 90% in 10 years

5 Protocol concerning Land Based Sources of Marine pollution (1999) to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena, 1983)

6 International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990

7 Oil Spills Protocol to the Convention for the Protection and Development of the marine Environment of the Wider Caribbean Region (Cartagena 1983)

In 1962 the hydrologist Dr Ir Percy Henriquez⁸ championed the idea of using as much as possible cesspits for the treatment of waste water. On an arid island he considered it important to regenerate the groundwater this way. This idea works perfectly well in low population density areas with limited groundwater flow to the sea. However the population density close to the sea has grown immensely since and high nutrient waste water is detrimental to the coral reefs. To reach a sustainable system for high density areas particularly close to the sea or watersheds, it is imperative to have good centralized sewage systems with treatment. The advantage of a centralized system is that it increases the chances for qualified management and it dilutes the risks of inappropriate additives to the waste water. Sewage treatments need to be far from sea near agricultural areas so the treated water which still is high on nutrients like nitrates and phosphates can be used for agriculture. Only water with a maximum level of nitrate and phosphate not detrimental to corals may be used for irrigation less than 200 m from shore or watersheds.

Present water treatments plants have to be improved on effectiveness and capacity and sufficient new ones be constructed for new higher density development plans. Construction costs will be part of development with operational costs to be covered by the real estate tax

It is clear that the above needs investment funds first from government, but it may have to be beyond what a SIDS could afford. More funds need to be identified and it is imperative that the government insures that investment in environmental necessities are the highest priority for international funds. Even so the need could be more than, given that all funds are available, the government can manage. To avoid delay it may be necessary to partner with private entities, particularly pertaining to the rule below. All sewage treatment should be under government supervision; this needs adequate capacity.

Within 500 m from shore or watersheds all new construction should be connected to a functioning treatment plant at least 1 km from shore. In case of a density of less than 20 ie/ha an exception can be made with the use of septic tanks or small treatment plants with a septic drain field at least 100 m from shore

The above is a general proposal which can be tweaked for different subsoils based on appropriate studies on subsoil water movement when available.

The waste water treatments plants should only be used for household and equivalent waste water without much fat. The treatment of industrial waste water, with different content as household waste water has to be (pre)processed as part of the industrial activity itself and can only be passed to a general treatment plant after approval. Several of the treatment plants should also have facilities to receive approved waste water from vacuum trucks.

Port Waste Reception facilities will be installed at all harbours. For yachts and similar ships only for household waste water and garbage, at others as appropriate also industrial waste like bilge waters and slops.

8 P.C. Henriquez, 1962. Problems relating to hydrology, water conservation, erosion control, reforestation and agriculture in Curaçao. Nieuwe West-Indische Gids, jaargang XLII

3. Air

One of the sources of air pollution is the refinery and other facilities around the west area of the Schottegat which use heavy fuel. However there are other sources which may be even more but are more dispersed. In case the pollution is from an installation it would be controlled through the permitting system. The pollution from traffic could be reduced by the use of cleaner fuels (see upgrade refinery). Presently regular obligatory vehicle testing is limited to safety aspects. This will be extended with environmental testing: exhaust testing on pollutants especially particles, but also maximum sound levels.

One way to reduce air pollution from traffic is to reduce, or at least not increase, traffic with motor vehicles. To one extend this can be accomplished by promoting bicycles by, as a standard rule, provide bicycle lanes along all crowded thoroughfares. The other way is to strongly promote public transport. Not only will this reduce traffic, but also will be more equitable as far as mobility is concerned. However the organization and investment needed to accomplish this will not be simple. The greatest difficulty will be to include the small privately run busses in the system.

Bans on the burning of trash⁹, particularly plastics and rubber that can produce the very toxic dioxins should be more strictly enforced.

4. Land Use

During the last century economic development has increased substantially with the accompanying increase in building and infrastructure; often not in an efficient way resulting in widespread building activity and extensive use of land. This hampered sustainable development by inappropriate use of land and great expense for government in providing infrastructure like roads, sewers, water, electricity and other utilities together with loss of biodiversity and land adequate for agriculture. To promote better development and avoid conflicts the Island Development Plan was developed¹⁰. The EOP introduces ideas for a more purposeful application of the available means and an efficient use of the limited available space. Developments should contribute to strengthening the economic situation and to provide a better quality of life for the local population. The most important purpose of a development plan is showing the desired future development of the island. It also indicates what measures are necessary and what the costs will be to implement the Plan. Furthermore, the Plan serves as a general framework for development aid plans and long range plans.

As an instrument for development and to prevent undesired development, zoning regulations have been included in the EOP. These regulations indicate to what use the lands on the island (also including the inlets, bays and other waters inside the coastline) may be put. These zoning regulations are obligatory for both the Government and the private sector. A clear distinction between urban and rural areas has been made. The most important feature of Willemstad is the relative nearness of facilities, employment and homes. In the next ten years, emphasis will be

⁹ Landsverordening Openbare Orde, PB 2015, 31.

¹⁰ EOP – Eilandelijk Ontwikkeling Plan - 1997

placed on more intensive use of the already urbanised area. In order to realise this, a strategy of concentration is chosen with developments principally concentrated in the urbanised area of Willemstad. This offers several advantages. The social benefits of living close to facilities are enhanced and traveling distances kept as short as possible and by using the existing facilities and infrastructure as optimally as possible and the government cost for infrastructure and utilities is kept down.

This Development Plan should be used as an instrument for the implementation of several environmental issues like climate change adaptation, waste water management, conservation, watershed management and for promoting better public transport and planning of traffic.

5. Solid and hazardous waste

5.1. General waste management

Goal: Reduction of waste getting into the landfill while illegal landfills will be remediated.

To reduce the amount of waste getting into landfills the policy is to use a waste hierarchy¹¹, starting with most favourable reduce, then reuse and recycle. Recycling is the most effective way to reduce landfilled waste. The bulk of garbage consists of recyclable products: primarily plastics, but also paper, cardboard, metal, wood, glass and building material. The material with the highest percentage of recycling is copper which sometimes is taken for recycling while still in use. The recycling efforts for other materials will have to be induced.

Plastics are one of most problematic forms of waste, not only because of the sheer quantity, but also because of the slow or no degradation; even if degraded many plastics remain in small particles that can be taken up in the food chain. As the low value of plastics do not entice recycling them, any action to do so has to be supported. For plastics there will be regulation that all plastic products, imported or produced locally, will have a SPI code¹² to make the sorting of different plastics easier and more certain. Equipment and facilities for recycling plastics, paper, cardboard or aluminium will not be taxed and where possible other support will be provided.

Recycling of glass in the strict sense is not economically feasible, but crushing of glass and using crushed glass in concrete or road foundations is. Government specifications for all road construction will include at least 10% crushed glass for the foundation. Crushed glass can also be used as a sandblasting medium

Organic waste, particularly from restaurants, can be used for feedstock of pigs. Information for households can include instructions on converting organic waste into compost. However organic waste would be the primary fuel for a waste to energy plant and so in competition with composting. The question is what would be most feasible. Most waste to energy plants, both by incineration and by digestion for the production of methane, depend on large systems, which may for Curaçao mean import of waste. Particularly the formation and emission of dioxins has to be avoided, a costly

11 In Dutch usually called: "Ladder van Lansink"

12 The Society of the Plastic Industries resin identification code – triangle of arrows with a number

enterprise. Methane production from the digestion of sludge from waste water, may be the most feasible form of waste to energy production.

Remediation of all landfills and dumps, legal and illegal, private or public, paid by landowners.

5.2. Littering

Goal: reduction of litter by 90%

Products of littering on Curaçao are often small bottles of soda, beer cans, single-use plastic bags and more and more foam food containers. Take-out is often consumed in the car and the refuse simply thrown out of the window. As particularly polystyrene foam containers are good receptacles for rain water and breeding spots for mosquitoes, they increasingly contribute to the transmission of mosquito vectored diseases. And there are better and safer products than foam containers on the market which are bio-degradable. Several take-out restaurants which are part of a global chain follow their company lead and use cardboard containers with the name of the company printed on them. And in the USA Chinese take-out is often also provided in a carton. This should be obligatory for all take-out restaurants. Not only is cardboard easier to degrade (fully biodegradable foam, made from fungus, is also available), but based on the principle that organizations need to take responsibility for their contribution to environmental degradation, they could be easier identified being co-culprits. To begin with: how difficult is it to remind their customers not to litter when handing out take-out? Eventually they can be made financially responsible for part of the clean-up.

To reduce littering, beyond above mentioned ancillary instruments, the relevant articles in the Public Order Ordinance¹³ have to be enforced, next to simple clean-up, financed by public funding next to fines and eventually *pro rata* the original providers of the litter material. A large part of the clean-up can be done *in natura* in lieu of part of the fines (f.i. each hour clean-up would be equal to f 100 of fine reduction).

Prohibition of single-use plastic bags and non-biodegradable food containers. Obligation to use food-containers identifying the restaurant¹⁴

5.3. Hazardous waste

Goal: Effective control of the chain of hazardous products to reduce negative effects.

Hazardous wastes, including radio-active waste, are amongst the greatest threats affecting human health and the health of the rest of the environment. The responsibility for the proper use and disposal of hazardous substances lies primarily at the sellers and users, but considering the effects of improper use and disposal of these substances have such a large impact on people and the environment, it is imperative that there is a strong control by government. This is very difficult for any country to do on its own, let alone for a SIDS.

There are presently three international conventions on hazardous substances, which together covers

¹³ Landsverordening Openbare Orde PB 2015, 31

¹⁴ These points can possibly be integrated in the “goods ordinance” (Lvo. houdende regels ten aanzien van waren (Warenlandsverordening), PB1997, 334); alternative is a comparable ordinance for the control of non-food goods which could be hazard to the environment or health.

most of the product chain of hazardous substances. The Rotterdam Convention controls the import of certain chemicals and pesticides based on the procedure of prior informed consent, which means that before a product is shipped to a country, this country has to agree with the shipment based on information on the product provided by the country of origin. The Stockholm Convention regulates the persistent organic pesticides that have long toxic life in the environment by banning the production of some and regulate the export of others according to strict rules. The Basel Convention regulates the transboundary movements of hazardous wastes, often needed for proper disposal.

As there are strong synergies between these conventions it makes sense to implement them together. Furthermore under their synergies programme the three conventions offer assistance for instruments needed for their joint implementation. One of those is a database on the whole chain from import, use and disposal of hazardous chemicals. This database can indicate leaks to the environment of these chemicals.

6. Energy and Oil

6.1. Energy

Goal: A general energy and water utility which provides in a dependable way for a reasonable cost with the least amount of fossil fuels possible

General well-being is often dependant on energy use for light, transportation, refrigeration, cooling, communication and entertainment. As yet most of our energy, including drinking water production, is derived from fossil fuels, almost all petroleum based, but there are many reasons to reduce this dependency: cost, pollution and climate change. The largest gain in reducing this dependency and its associated problems can be found in efficiency and a reduction of the use of energy. Most alternative energy sources are not available dependably for 24/7 and proven systems like hydro-electric systems and nuclear are not possible or feasible for Curaçao. Nuclear energy, apart from issues like security and nuclear waste are extremely expensive to build although they produce energy cheaply on the long run. But anywhere these systems cannot be build without large government subsidies for both construction and insurance; as such it is not a viable option for Curaçao. Presently there is no alternative to provide community energy without a least a certain percentage using fossil fuels, but this power generation has to be as clean and efficient as technically, and to a lower level financially, possible. Some improvement is possible on the short term by using natural gas instead of petroleum, which will reduce pollution and to a smaller extend carbon emissions.

Increase the percentage of energy generation with non-fossil fuel sources, without hampering dependable production, while seriously studying possible alternative sources which will provide continuous power without fossil fuels for the future

6.2. Refinery

Goal: within the timespan of this policy plan the pollution by the refinery will reduced to levels

not detrimental to health or the environment.

Although the use of fossil fuels to generate energy will have to be reduced, for the coming decennia they will still play a role.

The oil refinery is an important economic pillar for the island, but also a source of pollution, particularly of the air, but also the water and, locally, land. The pollution levels are presently such that it causes health problems, nuisance and are beyond the self-cleansing capacity of the environment.

To reduce air pollution more effective control of the present permit is needed. One of the best ways would be to also measure continuously with a broad spectrum of sensors the individual emission levels of each plant besides the general (including different sources), limited spectrum, immission¹⁵ levels as measured now at Beth Chaim and Kas Chikitu¹⁶. This would give a clear picture of the actual pollution by each plant next to the calculations of each possible source as presently done. Measurements of immissions are most relevant if used to assess whether additional installations with their permits in the area should be allowed. Beyond these emission measurements, the quality of the fuel used should be regularly analysed. The present high variability in certain immissions, both amounts of sulphur dioxide and a green substance containing heavy metals cannot only be explained by problems with operations, but also by the variability of fuel. The capacity, particularly technical, of the government controlling department has to be improved.

The present agreement with PdVSA includes a clause that any investment needed to attain a level of pollution lower than now stipulated in Attachment F (the document containing the norms) of the present permit, if this change is unilaterally issued by the government, these will have to be equally shared by PdVSA and Curaçao (i.e. Refineria di Kòrsou N.V.). This makes the government reluctant to demand pollution norms needed for reaching the goals mentioned in the introduction. However this agreement runs up to 2019. As of 1 January 2020 a new improved set of norms will be established which do take those goals into account. Part of business activities by an organization is to ensure that it avoids negative effects on the environment and this cannot be externalized. So any new agreement can *ipso facto* not include a clause that splits the cost of normal operations.

As per 1 January 2020 the norms for the refinery permit will be at least according to internationally accepted best practice levels

As part of the upgrade programme needed to extend the use of the refinery beyond 2019 the government is planning to import natural gas, either in liquid form or piped, as a fuel for the refinery, its utilities and possibly the general utilities. The use of natural gas will reduce the discharge of pollutant, particularly SO₂, considerably compared to the pitch presently used. An alternative could be to use processed slurry oils in the catalytic cracker, but this may not be as effective as the use of natural gas. Natural gas will also reduce the discharge of CO₂ and so (minimally) the Curaçao contribution to climate change.

A general advantage of upgrading the refinery will be the availability of fuels of higher quality and

15 Emission is what is discharged into the environment by source, immission is what gets in the environment (measured on the ground)

16 <http://www.luchtmetingencuracao.org/>

lower sulphur content, which will reduce pollution by traffic. Without upgrading the refinery with a drastic reduction of pollutants and production of superior grade products, the refinery has no future.

If in the future any off-shore installation for the exploration and exploitation for gas or oil will be established in the waters of Curaçao, they will have to adhere to the pertinent articles of the Ordinance on Maritime Management and the OPRC convention, besides being insured for any possible costs for clean-up and damage by a spill.

7. Climate Change

Goal: to substantially reduce the emissions by Curaçao of all greenhouse gasses and to prepare in a timely fashion for the consequences of climate change, particularly sea level rise.

The mechanisms of climate change are well known. Several types of gasses (“greenhouse gasses”: mainly carbon dioxide, but also methane and nitrous oxides) trap reflected heat from the sun and so change the processes which rule our global climate. All scientists doing actual research on climate agree that climate change caused by human action is real; the residual discussion is only how much and how fast. Although the results of the last climate conference in Paris were a small step in the right direction if all countries, including Curaçao, will follow the lead, we will still have to adapt. It is not certain how the actual weather patterns for Curaçao will develop; probably more extremes: more and longer droughts, heavier rains. More clear is that there will be sea level rise, which will make the coastal systems more vulnerable and could augment sea water intrusion into groundwater. Estimates of sea level rise from the level of the year 2000, in case of no change in greenhouse gas emissions, go up to 25 cm in 2050 and almost 1 m in 2100. Twenty-five centimetres do not look much and is less than the mean tide on Curaçao. But it will not only make our coastal systems more vulnerable during storms, but also reduce the decline angle for drainage during heavy rains and in case no action is taken about watersheds it will produce more flooding than ever before.

7.1. Mitigation

If the UN Framework Convention on Climate Change (UNFCCC) would come in force for Curaçao, an audit of all carbon emissions and sinks as of 1992 and changes in the present will have to be executed. This audit, which may be co-financed by the Kingdom as it is part of an international commitment, can provide clearer direction in how Curaçao can play its role in decreasing net greenhouse gas emissions most effectively. Besides this fine-tuning, the government should already begin with actions which would limit the use of fossil fuels and safeguard if not increase carbon sinks.

A lot can be done without too much legislation by the government itself. One possibility is setting a thermostat minimum of f.i. 24 degrees for the cooling of all government buildings; this may have to include an adaptation to an appropriate dress code. Another item is to change all street lighting to efficient LED lighting which will only illuminate the street and not the sky. Longer term measures have to be prepared by greatly improving public transport and the use of bicycles by providing

appropriate paths along all major traffic lanes. Only after providing enough viable alternatives, car fuel measures can really be executed, although a financial incentive by heavier taxation of cars with low mileage while importing is called for. An increase of road tax for heavier vehicles is already a necessity for the fair distribution of road maintenance costs, but this will also help for fuel reduction.

Beyond the UNFCCC itself are the Kyoto protocol and the Paris Agreement, as separate extensions of the Convention. The Kyoto Protocol actually states quantitative reductions of carbon emissions, which can be offset by the increase of sinks or a cap-and-trade regime, even elsewhere. It specifically makes a distinction between industrialized and developing countries. To a certain extent Curaçao belongs to both with a relative high GDP and (probably) one of the highest per capita carbon emissions in the world. On the other hand as a small community its gross contribution is small. For the time being it may be more transparent to not immediately be part of the protocol, particularly as part of the Kingdom of the Netherlands the European rules will have to be adhered to with a base date of 1991. The Paris Agreement asks commitments to the extent the country thinks it could comply with but with the goal to keep the maximum increase of average global temperature well below 2° C above pre-industrial levels, while trying to limit the temperature increase to 1.5° C. Curaçao should develop a vigorous policy to reduce its own carbon emissions to such extent that it complies with the above goals.

Besides legislation to go beyond those carbon reductions mentioned, it is paramount that carbon sinks are as much protected as possible. One item needed is to avoid unnecessary clearance of vegetation. Any large scale clearing, meaning by burning or the use of large equipment, should be dependant on a permit. For a reasonable clearing in the direct vicinity a building permit may be sufficient, but beyond that any clearing should have a good reason which should be extensively explained and argued before a permit is issued. These measures will also be important for protecting the biological diversity essential to sustainable development.

7.2. Adaptation

Adaptation to the effects of climate change includes an obligatory consideration of climate related aspects in the code when issuing building permits, both related to natural ventilation and cooling as well as adequate insulation. For the effects of both sea level rise and extreme weather, the watershed regulations mentioned in the fresh water chapter will be executed, as well as restrictions on building permanent constructions in vulnerable areas like the first few meters above sea level. Considerations of these vulnerable areas for insurance purposes should be discussed to avoid that the general population would pay for the extra cost of insurance for these buildings.

8. Nature

Goal: The conservation and management of nature and all the services it provides.

Although in general environmental and conservation issues are closely related, still this policy plan is primarily directed towards the “grey” environment. However biological diversity is an essential

element for sustainable development; not only for purposes of tourism, water management and general well-being, but also as a source of genetic resources needed for the production of food, technology and medicine. A more extensive nature plan will have to be developed in the near future. To provide a basis for this plan several steps have to be taken first:

- for proper protection on the species level a “red list” of indigenous species will have to be compiled to add to those which are protected according to treaties the country is party to;
- a description of the different habitats on the island to ensure that habitat protection is executed in a representative way;
- a study on ecosystem services will be done to ensure that nature on the island will keep providing the highest possible benefits for all.

To prepare a nature plan a forum of all stakeholders will be convened.

9. Laws and regulations

Goal: create a system of functioning laws and regulations to underpin the environmental policy.

A general environmental ordinance will be developed as the main instrument for implementation. This will combine all the different ordinances concerning nuisance permits, solid waste management, waste water management and environmental impact assessments. Moreover it will provide the possibility of implementing different conventions in a consistent way. Maximum sanctions will be according to the highest category, although for enforcement, administrative actions will play an important role.

Most of the chapters of this ordinance can be copied from existing (former) island ordinances, with some adaptations based on experience and new insight. The following chapters will be included:

- Environmental permitting for installations which can have a negative influence on the environment, the former nuisance ordinance. Some of the additions will be a change from a general charge (leges) for the permit to a compensation based on the cost of inspection (see chapter on enforcement); an obligation on the installation of continuous monitoring sensors if applicable whose data are at all times available to the Inspection of Environment; the publication of general terms simple installations will have to comply with, without a direct permit; rules for the permitting and inspection of defence installations.
- Waste water, including rules for connecting to sewerage, when alternative individual waste water systems will be allowed and their construction depending on the distance to the coast and the geology, regulations for the reuse of treated waste water.
- Solid waste, including regulations and permitting of solid waste collection and processing, landfill management and recycling.
- Hazardous substances, including their disposal

- Environmental Impact Assessment, when obligatory and how the process goes.
- Implementation of the LBS protocol, the Basel Convention¹⁷, its sister conventions, the Rotterdam Convention¹⁸ and the Stockholm Convention¹⁹, and a handle to implement possible other environmental treaties.

Other Ordinances

An environmental “wares” ordinance to be used for the regulation of imported or produced products which can have an effect on the environment. Examples could be the obligation to have SPI codes embossed in plastic products; banning of non-recyclable products if alternatives are available.

A nature ordinance to complement the Framework Ordinance on Nature Management and Protection.²⁰

Other Treaties

Besides those treaties being implemented through the general environmental ordinance, others which have a broader working sphere should be implemented; the following have to be considered

- UN Framework Convention on Climate Change, including later protocols
- The Cartagena Protocol under the Convention on Biological Diversity, which regulated imports of Genetically Modified Organisms (GMO) on the basis of prior informed consent.
- The Nagoya Protocol under the Convention on Biological Diversity, which provides basic intellectual property rights for the country and for indigenous knowledge on genetic resources.

10. Enforcement

Goal: an effective enforcement of environmental laws and regulations with improved capacity.

Enforcement of the different chapters (and precursors) of the environmental ordinance lies with the Inspection of Environment and Nature. As part of the Inspection for Public Health there will be a full mandate to inspect organizations and enforce their compliance with their permits. The legal aspects for this should be properly be reviewed and, if needed, adapted. To avoid haphazard enforcement, there should be an approved protocol which describes the different levels and timelines for the inspection. The function of the ministry and the government is to check the legitimacy of that the inspection vis-a-vis the protocol and to request new priorities.

To facilitate the inspection, the regular charges (leges) for a permit will be changed to a compensation towards the cost of the inspection. Upon issuing a permit, the compensation will be

¹⁷ Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989).

¹⁸ Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (1998).

¹⁹ Stockholm Convention on Persistent Organic Pollutants (2001).

²⁰ Landsverordening grondslagen natuurbeheer en -bescherming, PB 1998 no 49 (as amended)

estimated based on the cost and frequency of the inspection. If the results of the inspections show a positive adherence to the permit, the frequency and intensiveness of inspections can be reduced and so the compensation. The other direction is of course also possible. This will provide an incentive to improve the internal environmental care of each organization. Especially in the case of a temporary reprieve of norms based on the self-depurative capacity of environment, the more frequent and intensive inspections and so higher costs, can lead to a faster compliance to stricter norms.

Inspection and enforcement should also include aspects of sewage, solid and hazardous waste, including the control of import and production of possible hazardous chemicals. To be able to comply with its functions, the Inspection needs enough capacity, not only in quantity, but especially quality.

11. Communication & Education

Goal: to create though communication and education good support for the implementation of the environmental policy and to provide the educational benefits of knowledge and understanding of the environment and nature.

The environment is not only depleted by individuals acting independently and according to their self-interest without taking the interest of the whole into account²¹, but sometimes also by the short term needs of people without other resources. Both can be addressed by education to in general enhance the survival chances of the needy without dismantling those resources needed for their longterm survival, and on the other hand provide all with the understanding that care for the environment is not a luxury, but necessary for survival for all. The basic ideas behind sustainable development as described by the Brundtland report²².

Improving education in general goes far beyond the scope of this document, but to implement most of the actions described, support is needed and so good information has to be provided at implementing each action.

Companies and other organizations have to get proper information on how to setup good internal environmental care. This can be executed with the help of the Curaçao Business Council for Sustainable Development (Bedrijvenplatform Milieu – BPM)²³.

For schools, both primary and secondary, learning material will be developed. Some of this work is already getting done by GreenKidz.²⁴

21 G. Hardin, 1968. The Tragedy of the Commons. Science Vol 162, no 3859.

22 The World Commission on Environment and Development, 1987. Our Common Future. Oxford Univ. Press

23 www.bpmcuracao.com

24 www.greenkidz.org

12. Research

Goal: create a good infrastructure of data and information concerning the most important environmental parameters

Policy can only properly implemented and monitored with good qualitative and quantitative data. A good scientific infrastructure and data base of the most important environmental parameters will have to be set in place. The primary responsibility for this will be at the Policy Department of the GMN ministry, but several research programmes can be executed by different scientific institutions, consultancies and by the different entities that execute certain tasks.

A comprehensive monitoring programme should be established concerning amongst others:

- flows waste and littering;
- energy and water use;
- groundwater quality and quantity;
- surface water quality;
- natural vegetation cover;
- database of (hazardous) chemical substances, including production, import and disposal.

Beyond the monitoring a scientific infrastructure should be available to be consulted if needed.

Annex

Chapter	Item	Timeline	Estimated cost (ANG)	Implementation partners
1	Alternative funding sources	2016	PM	Kingdom, EU, UNDP, private sector, NGO's
9	Preparing general ordinance	2016	PM	Legal department and other stakeholders
10	Upgrade Inspection (legal, personnel & equipment)	2016	PM	GMN
2.1	Implementation LBS protocol	2016	PM	Ministry General Affairs, GMN
2.1	Oil Spill contingency plan and ordinance	2016	PM	GMN, Maritime affairs
2.2	Fresh water strategy plan	2016	250 000	GMN, VVRP
2.3	Waste water structure plan	2016	100 000	VVRP
2.3	Improving waste water treatment plants	2016-2017	50 000 000	VVRP
2.3	Extending sewerage and treatment	2016-2020	150 000 000	VVRP, developers
2.3	Installing Port Reception Facilities	2016-2020	1 000 000	CPA, Maritime Affairs
3	Extend Vehicle testing	2016	PM	VVRP
3	Improve Public Transport	2016-2021	PM	VVRP
4, 2.1, 2.2, 7.2	Update EOP	2016-2017	PM	VVRP
5	Waste management plan	2016	200 000	Selikor
5.3	Implementation Basel, Rotterdam and Stockholm treaties with database	2017-2020	50 000	Legal department and Foreign Affairs Service
6.1	Energy Plan, focussed on energy use reduction and alternative sources.	2016-2017	100 000	GMN, MEO
6.2	Installing sensors in stacks of Refinery, CRU, Aqualectra	2016	300 000	Isla, RdK, Aqualectra
6.2	Refinery upgrade	2016-2019	5 000 000 000	RdK and operator
6.2	Update of refinery permit standards to acceptable levels	2019	200 000	GMN, consultant
7.1	Implement UNFCCC	2016	PM	Foreign affairs
7.1	GHG emission reduction plan	2017	150 000	GMN, MEO
7.1	Permit system vegetation removal	2016-2017	PM	GMN, VVRP, Legal Dt
7.2	Sea level rise vulnerability plan	2016-2017	250 000	GMN, VVRP
8	Red list of indigenous species	2016	50 000	GMN, Carmabi
8	Inventory of Habitats	2017	100 000	GMN, Carmabi
8	Nature forum and plan	2016	10 000	GMN
8	Ecosystem benefit study	2016	300 000	Dutch ministry of Economy, VU
9	Environmental "wares" ordinance	2016	PM	GMN, legal department
11	Develop and implement a communication strategy	2016-2017	25.000	GMN
12	Comprehensive monitoring plan	continuous	50.000 annual	GMN, VVRP, Carmabi
12	Science infrastructure	continuous	PM	GMN, OCWS

Acknowledgements

For the preparation of this document consultations were held with:

ROP (Jonker), OW/afvalwater (Cordilia, Gilbert, Bomberg), Selikor (America), Aquallectra (Tujehut), Uniek Curaçao (vd Giessen), Amigu di Tera (Raveneau, Narain), Refineria Isla (Rhuggenaat, Chance), MDTP (Wiels, Daal)

Document prepared by: E.C. Newton with Environmental Policy Division of GMN (C. Profas, J. Ras)

Towards a Sustainable Future



Healthy Reefs, a Healthy and Clean Environment with Healthy People