



**National Implementation Plan (NIP) for the Stockholm
Convention on Persistent Organic Pollutants (POPs) for Saint
Kitts and Nevis**

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ABBREVIATIONS AND ACRONYMS

ABS	Acrylonitrile butadiene styrene
ACP	African, Caribbean and Pacific
AFFF	Aqueous film-forming foams
Alpha-HCH	Alphahexachlorocyclohexane
Beta-HCH	Beta hexachlorocyclohexane
APCS	Abatement Pollution Control System
BAT	Best Available Techniques
BCRC-Caribbean	Basel Convention Regional Centre for Training and Technical Transfer for the Caribbean Region
BEP	Best Environmental Practices
BFR	Brominated flame retardant
c-DecaBDE	Commercial Decabromodiphenyl ether
c-OctaBDE	Commercial octabromodiphenyl ether (hexaBDE and heptaBDE)
c-PentaBDE	Commercial pentabromodiphenyl ether (tetraBDE and pentaBDE)
CARICOM	Caribbean Community
CARPHA	Caribbean Public Health Agency
CDEMA	Caribbean Disaster Emergency Management Agency CDEMA
CDM	Comprehensive Disaster Management
CEHP	Caribbean EcoHealth Programme
CGPC	Coordinating Group of Pesticides Control Boards of the Caribbean
COP	Conference of the Parties
CROSQ	CARICOM Regional Organisation for Standards and Quality
CRT	Cathode ray tube
DCPA	Development Control and Planning Act
DDT	Dichlorodiphenyltrichloroethane
DDE	Dichlorodiphenyldichloroethylene
DecaBDE	Decabrominated diphenyl ether
DoA	Department of Agriculture
DPPE	Department of Physical Planning and Environment
ECCU	Eastern Caribbean Currency Union
EEE	Electrical and electronic equipment
EIA	Environmental Impact Assessments
ELVs	End-of-life vehicles
EPR	Extended producer responsibility
EPS	Expanded Polystyrene
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FAST	Farming for agricultural systems transformation

FDI	Foreign direct investment
Gamma-HCH	Gamma hexachlorocyclohexane
GC	Governing Council
GDP	Gross domestic product
GEF	Global Environment Facility
GHS	Globally Harmonized System of Classification and Labelling of Chemicals
GSKN	Government of Saint Kitts and Nevis
HBB	Hexabromobiphenyl
HBCD	Hexabromocyclododecane
HCB	Hexachlorobenzene
HCBD	Hexachlorobutadiene
HeptaBDE	Heptabromodiphenyl
HexaBDE	Hexabromodiphenyl
HIPS	High-impact polystyrene
IARC	International Agency of Research on Cancer
IDB	Inter-American Development Bank
INC	Intergovernmental Negotiating Committee
IPM	Integrated Pest Management
JNF	Joseph N France General Hospital
LCD	Liquid crystal display
MEA	Multilateral Environmental Agreement
MTESP	Medium-Term Economic Strategy Paper
MW	Medical Waste
NAS	National Adaptation Strategy
NCEMA	National Conservation and Environmental Management Act
NCEPA	National Conservation and Environment Protection Act
NEMS	National Environmental Management Strategy
NEVLEC	Nevis Electricity Company Ltd.
NGOs	Non-governmental organizations
NIP	National Implementation Plan
NPDP	National Physical Development Plan
NPRS	National Poverty Reduction Strategy
NSPS	National Social Protection Strategy and Plan of Action
NSWMA	Nevis Solid Waste Management Authority
OctaBDE	Octabromodiphenyl ether (hexaBDE and heptaBDE)
OFS	Operation food security
OCPs	Organochlorine pesticides
OECS	Organisation of Eastern Caribbean States
PBB	Polybrominated biphenyl

PBDEs	Polybrominated diphenyl ethers
PCBs	Polychlorinated biphenyl
PCDD	Polychlorinated dibenzo-p-dioxins
PCDF	Polychlorinated dibenzofurans
PCNs	Polychlorinated naphthalenes
PCP	Pentachlorophenol
PeBz	Pentachlorobenzene
PeCB	Pentachlorobenzene
PentaBDE	Pentabrominated diphenyl ether
PFAS	Per- and polyfluoroalkyl substances
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulphonic acid
PIC	Prior Informed Consent
PMU	Project Management Unit
POP-BFRs	Persistent organic pollutants-brominated flame retardants
POP-PBDEs	Persistent organic pollutants-polybrominated diphenyl ethers
POPs	Persistent organic pollutants
PSIP	Public Sector Investment Planning
PTCCB	Pesticides and Toxic Chemicals Control Board
PPP	Polluter Pays Principle
PUR	Polyurethane
PWC	Project Working Committee
RBPR	Rapid Bioassay of Pesticide Residues
RLB	Robert L Bradshaw (RLB) International Airport
RSS	Regional Security System
SAICM	Strategic Approach to International Chemical Management
SC	Stockholm Convention
SCCPs	Short chain chlorinated paraffins
SDGs	Sustainable Development Goals
SEA	Socio-economic assessment
SIDS	Small Island Developing States
SKELEC	Saint Kitts Electricity Company Ltd.
SKN	Saint Christopher (Saint Kitts) and Nevis
SKNBS	Saint Kitts and Nevis Bureau of Standards
SKSAP	Saint Kitts Strategy & Action Plan for Agriculture
SOP	Standing operating procedures
SSNA	Social Safety Net Assessment
SWMC	Solid Waste Management Corporation (Saint Kitts)
TCSs	Toxic Chemical Substances
TetraBDE	Tetrabromodiphenyl

TEQ	Toxic Equivalence
TV	Television
UN	United Nations
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNICEF	United Nations Children's Fund
UNIDO	United Nations Industrial Development Organization
UNWOMEN	United Nations Entity for Gender Equality and the Empowerment of Women
UPOPs	Unintentional persistent organic pollutants
US	United States
USA	United States of America
WEEE	Waste electrical and electronic equipment
WHO	World Health Organization
WTO	World Trade Organization
XCD	Eastern Caribbean Dollars
XPS	Extruded Polystyrene

EXECUTIVE SUMMARY

The Saint Christopher (Saint Kitts) and Nevis Persistent Organic Pollutants (POPs) National Implementation Plan (NIP) is an all-inclusive, strategic policy document, the purpose of which is to construct an effective POPs management system through the application of a sustainable policy to protect human health and secure environmental protection as defined in the Stockholm Convention (SC). The SC on POPs was developed out of an international awareness that POPs posed major and increasing threats to human health and the environment, and an international commitment to take measures to protect human health and the environment.

The Convention was adopted and opened for signature in May 2001 in Stockholm. This convention marked the third multilateral environmental agreement (MEA) to address chemicals management, following the Basel Convention on the Transboundary Movement of Hazardous Chemical Waste and the Rotterdam Prior Informed Consent (PIC) Convention. Currently there are 28 POPs (16 of which have been recently added) covered by the Convention. The Stockholm Convention's aim is to provide the required technical and financial resources to assist countries to take action to reduce and eliminate the releases of these chemicals, recognising that:

1. POPs pose significant threats to human health and the environment in Saint Kitts and Nevis.
2. Saint Kitts and Nevis is a Small Island Developing State (SIDS) that does not manufacture any of the group of POPs and other toxic chemicals listed in the Stockholm Convention but may be unintentionally producing POPs.
3. It is possible that Saint Kitts and Nevis may be utilizing POPs and other toxic chemicals of this nature and equipment containing POPs.

The NIP update in Saint Kitts and Nevis is an integral part of the project for the Development and Implementation of a Sustainable Management Mechanism for POPs in the Caribbean. The project was identified as critical to the sustainable development of the Caribbean region with funding approved by the Global Environment Facility (GEF) in 2015. This project (GEF #5558) is essential to advance the commitments of participating States to the Stockholm Convention and address the lack of capacities and capabilities to manage POPs and toxic chemical substances (TCS). The national focal point and implementing agency for the project was the the Saint Kitts and Nevis Bureau of Standards (SKNBS) which was supported by a multi-sectoral Project Working Committee (PWC).

Commitment to implementation of the NIP

The development and implementation of the NIP is evidence of Saint Kitts and Nevis' commitment to:

1. remain compliant with the obligations of the Stockholm Convention on POPs;
2. reduce and eventually eliminate the unintentional release or emission of POPs; and
3. protect human health and the environment.

Under the Stockholm Convention, Parties seek to:

- a. identify and implement measures to reduce or eliminate releases from intentional production and use;
- b. establish a register of specific exemptions that Parties which have the need of continuing the use of POPs with exemption, might further use these POPs and register for exemption;
- c. identify and implement measures to reduce or eliminate releases from unintentional production;
- d. identify and implement measures to reduce or eliminate releases from stockpiles and wastes;
- e. develop and implement a plan for the implementation of the obligations under the Stockholm Convention;
- f. submit proposals for the listing of chemicals in Annexes A, B and/or C;
- g. facilitate or undertake exchange of information relevant to the reduction or elimination or production, use and release of POPs and exchange information regarding alternatives to POPs;
- h. promote and facilitate awareness among policy and decision makers, stakeholders and the public regarding POPs; and
- i. undertake appropriate research, development, monitoring and cooperation pertaining to POPs, within each Party's capabilities and resources.

Key Issues and National Priorities

In Saint Kitts and Nevis, the Pesticides and Toxic Chemicals Control Board (PTCCB) is the agency responsible for approval of imports of all pesticides entering Saint Kitts and Nevis. The inventory findings showed that POP pesticides are not produced in Saint Kitts and Nevis and that there is no data on the historic use of the old POP pesticides. Currently, the majority of POP pesticides (old and newly listed) is banned (chlordane, dieldrin, endrin, heptachlor, hexachlorobenzene, pentachlorobenzene, toxaphene, dichlorodiphenyltrichloroethane (DDT), lindane) or not registered for use (chlordecone, endosulfan, mirex) and, pentachlorophenol (PCP) which is used to treat utility poles is no longer imported. The historic use of PCP treated poles is unknown but currently, poles are not treated with PCP.

The generation, transmission and distribution of electrical power is the responsibility of the Saint Kitts Electricity Company Ltd. (SKELEC) and the Nevis Electricity Company Ltd. (NEVLEC). Both companies use a small number of large transformers on the ground and smaller transformers located on utility poles. The assessment of transformers contaminated with PCBs conducted in 2016, showed that all samples of transformer oils analysed recorded PCB concentrations of lower than 50 ppm (the Stockholm Convention threshold for PCB contamination).

The 2016 inventory estimated the total emission of polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) for Saint Kitts and Nevis at 0.062 g TEQ/a. The emissions as residue was the highest (0.028 g TEQ/a) and was also the major contributor to the overall PCDDs/PCDFs emissions. The second highest emission of PCDDs/PCDFs was to air, (0.021 g TEQ/a). The major contributor of PCDDs/PCDFs to residue was disposal of mixed domestic and industrial inputs. Open burning processes and power generation were the major contributors to the air emission.

The assessment of the newly listed POP groups perfluorooctane sulphonic acid (PFOS) its salts and related chemicals, and polybrominated diphenyl ether/hexabromocyclododecane (PBDE/HBCD), showed the need for awareness, legislation and/or regulation to address their management in an environmentally sound manner. The preliminary assessment of PFOS/PFOS-related chemicals showed that these are not manufactured in Saint Kitts and Nevis. The major current use of PFOS and PFOS-related substances is in firefighting foams used for hydrocarbon fires. The only national body that uses these PFOS/PFOS-containing foams is the Saint Kitts and Nevis Fire and Rescue Services. The Robert L Bradshaw (RLB) International Airport Fire Station and the Newcastle Fire Station both stocked quantities of these foams.

The focus of the assessment on PBDEs was on electrical and electronic equipment/waste electrical and electronic equipment (EEE/WEEE), specifically, cathode ray tube (CRT) computer monitors casing and television casings and plastics/polymers from end-of-life vehicles (ELVs) (specifically those manufactured before 2004 and from the United States of America (USA)). The assessment showed that imports of CRTs were low but the in-use and stored EEE/WEEE are evident in households. The public sector commenced the phase out of CRT monitors in 2009 while the private companies stopped imports a year later in 2010. Current regulations do not restrict the import of used older vehicles into Saint Kitts and Nevis. Some of these vehicles may be impacted (containing PBDE) thus proper management and disposal of potentially impacted ELVs is needed.

Generally the assessments of all POPs groups showed that POPs containing products may be prevalent in a range of consumer products (EEE, cars, textiles, carpets, paints, clothing, kitchen utensils, etc.) agricultural and industrial chemicals and the proper management and disposal of these products have to be addressed. Similarly, potentially POPs contaminated sites (landfill/waste management/dump sites, storage sites, etc.) are present in Saint Kitts and Nevis and must be

assessed and managed accordingly.

In implementing the SC on POPs in Saint Kitts and Nevis, the following quantifiable national priorities were identified and the projected budget for implementation was developed (Table ES-1).

Table ES-1: Estimated budget for priority activities for POPs management in Saint Kitts and Nevis.

National Priorities	Estimated Budget XCD
Development/Amendment of specific (existing) legislation/legal instruments on sound management of chemicals and hazardous waste (648,045 XCD).	
Develop an adequate legislative framework and policy for POPs pesticides.	240,495
Establish a regulatory framework for management of POP-BFRs (hazardous chemicals) and related articles and waste categories.	81,510
Establish policy and a regulatory framework for the use, management and substitution of PFOS and related substances and PFAS in industrial uses and in products and waste.	81,510
Establish policy and legal framework for reduction and minimization of unintentional POPs (PCDD/Fs, PCNs, HCB, PCBs and HCBd).	81,510
Establish a regulatory framework for contaminated sites.	163,020
Education, training/capacity building and awareness-raising on chemicals management issues including hazardous and chemical waste (149,510 XCD).	
Training and awareness raising for stakeholder groups on PFOS and PFAS and establishing approach for information exchange	81,510
Increase awareness of the public on POPs	68,000
POPs stockpile management and improvement of waste management and introduction of waste hierarchy towards circular economy and reduction of unintentionally formed POPs from open burning (1,434,150 XCD).	
Sound Life Cycle Management of PBDE and HBCD product and waste categories (EEE/WEEE, end of life vehicle, insulation foam, and possibly textiles, furniture etc.)	81,510
Reduce releases from open burning of wastes (private burning & landfill fires) and biomass burning by improvement of waste management (waste hierarchy; circular economy)	300,000
Take measures so that wastes are disposed of in an environmentally sound manner	30,000
Identify stockpiles, products and articles in use and waste consisting of, containing or contaminated by POPs chemicals	82,000
Ensure the management and remediation of stockpiles/waste products in an environmentally sound manner	570,000
Built knowledge and capacity for management of PFOS/PFAS containing products and waste categories)	370,640
Assessment and management of contaminated sites (354,000 XCD).	
Develop methodology to identify, assess and prioritize POPs contaminated sites considering available guidance documents	54,000

National Priorities	Estimated Budget XCD
Secure POPs contaminated sites, and where feasible conduct remediation of contaminated sites	300,000
Monitoring of POPs, initiating research and collaborations (996,000 XCD).	
Monitoring and analysis of POPs and other chemicals	666,000
Establish monitoring of PCDD/F and other UPOPs and relevant pollutants from Annex II and III sources and human exposure) Identification, assessment and management of potentially Dioxin/UPOPs contaminated sites and securing /remediation	330,000
BAT/BEP for Dioxin/UPOPs reduction and integrated pollutant prevention and control (136,350 XCD).	
Promote the use of BAT and BEP for existing waste incinerators to reduce or eliminate UPOPs	136,350
Update and refining of inventories (385,845 XCD).	
Update and refine inventory of PBDEs (with DecaBDE) and HBCD containing articles and wastes/resources and develop or update appropriate databases for information management.	135,845
Develop and maintain source inventories and release estimates	250,000
Estimated costs for quantifiable priorities	4,103,900

1 INTRODUCTION

1.1 OVERVIEW OF PERSISTENT ORGANIC POLLUTANTS (POPs)

1.1.1 What are POPs?

POPs are organic chemical substances (i.e. carbon-based) that persist in the environment, bioaccumulate through the food web and pose a risk of causing adverse effects to human health and the environment. POPs possess a particular combination of physical and chemical properties such that, once released into the environment, they:

- remain intact for exceptionally long periods of time (many years);
- become widely distributed throughout the environment as a result of natural processes involving soil, water and most notably, air;
- accumulate in the fatty tissue of living organisms including humans and are found at higher concentrations at higher levels in the food chain; and
- are toxic to both humans and wildlife (US-EPA, 2018).

1.1.2 The harmful effects of POPs

The release of POPs to the environment over several decades (due especially to human activities) has resulted in POPs being widely distributed over large regions (including those where POPs have never been used) and in some cases they are found around the globe. This extensive contamination of environmental media and living organisms includes many foodstuff and has resulted in the sustained exposure of many species, including humans, for periods of time that span generations, resulting in both acute and chronic toxic effects.

Highly chlorinated and brominated POPs insoluble in water, readily bind to fatty tissue, where concentrations can become magnified by up to 70,000 times the background levels. Some POPs are soluble in water and bind to protein rich organs. Fish, predatory birds, mammals and humans are high up the food chain and so absorb the greatest concentrations (biomagnification). POPs can also travel by atmospheric transport. As a result of these processes, POPs can be found in people and animals living in regions such as the Arctic, thousands of kilometres from any major POPs source.

Specific effects of POPs can include cancers, allergies and hypersensitivity, damage to the central and peripheral nervous systems, reproductive disorders, and disruption of the immune system. Some POPs are also considered to be endocrine disrupters, which, by altering the hormonal system,

can damage the reproductive and immune systems of exposed individuals as well as their offspring; they can also have developmental and carcinogenic effects¹.

1.2 THE STOCKHOLM CONVENTION ON PERSISTENT ORGANIC POLLUTANTS

1.2.1 Overview of the Stockholm Convention (SC)

In May 1995 the Governing Council (GC) of the United Nations Environment Programme (UNEP) requested an international assessment on 12 POPs. Results of that assessment prompted the GC to convene an Intergovernmental Negotiating Committee (INC) to prepare an international, legally binding instrument on POPs, as the basis for global action for the protection of human health and the environment from the negative consequence of these 12 POPs.

After several years of negotiations among national delegations, environmental non-governmental organizations and industry representatives, the final text of the Stockholm Convention on Persistent Organic Pollutants was completed. The Conference of Plenipotentiaries adopted the Convention on May 22, 2001 in Stockholm, Sweden. The Convention entered into force on May 17, 2004 and Saint Kitts and Nevis acceded to it on May 21, 2004.

The SC on POPs is a global treaty to protect human health and the environment from chemicals that remain intact in the environment for long periods, become widely distributed geographically, accumulate in the fatty tissue of humans and wildlife, and have harmful impacts on human health and the environment.

1.2.2 Overview of the twelve (12) initial POPs under the Stockholm Convention

Initially 12 organic chemical substances, known as the “dirty dozen”, were identified under the SC. These chemicals are listed in three (3) annexes to the Convention:

- Annex A – chemicals to be eliminated
- Annex B – chemicals which have restricted use
- Annex C – unintentionally produced chemicals

The 12 initial POPs are classified under 3 categories, as follows:

a. **Pesticides:**

1. **Aldrin** *Listed under Annex A*

A pesticide applied to soils to kill termites, grasshoppers, soil and other insect pests.

¹ What are POPs? – Stockholm Convention Official Website
(<http://chm.pops.int/TheConvention/ThePOPs/tabid/673/Default.aspx>)

2. Chlordane *Listed under Annex A*

Used extensively to control termites and as a broad-spectrum insecticide on a range of agricultural crops.

3. Dichlorodiphenyltrichloroethane (DDT) *Listed under Annex B with acceptable purpose for disease vector control*

DDT was widely used during World War II to protect soldiers and civilians from malaria, typhus, and other diseases spread by insects. It continues to be applied against mosquitoes in several countries to control malaria.

4. Dieldrin *Listed under Annex A*

Used principally to control termites and textile pests, dieldrin has also been used to control insect-borne diseases and insects living in agricultural soils.

5. Endrin *Listed under Annex A*

This insecticide is sprayed on the leaves of crops such as cotton and grains. It is also used to control mice, voles and other rodents.

6. Heptachlor *Listed under Annex A*

Primarily employed to kill soil insects and termites, heptachlor has also been used more widely to kill cotton insects, grasshoppers, other crop pests, and malaria-carrying mosquitoes.

7. Hexachlorobenzene (HCB) *Listed under Annex A and Annex C*

HCB kills fungi that affect food crops. HCB is also an industrial chemical and can be released as an unintentional by-product of combustion processes. HCB is also used in the production of rubber, aluminium, munitions and dyes and in wood preservation and other manufacturing.

8. Mirex *Listed under Annex A*

This insecticide is applied mainly to soils to kill fire ants and other species of ants and termites. This chemical is also used as a fire retardant in plastics, rubber, and electrical goods.

9. Toxaphene *Listed under Annex A*

This insecticide, also called camphechlor, is applied to cotton, cereal grains, fruits, nuts, and vegetables. It has also been used to control ticks and mites in livestock.

b. Industrial Chemicals:**10. Polychlorinated Biphenyls (PCBs)** *Listed under Annex A with specific exemptions and under Annex C*

PCBs are good electrical insulators at high voltages (dielectric properties), have longevity, are non-flammable, and are resistance to thermal and chemical degradation. They are employed in industry as heat exchange fluids, in electric transformers and capacitors, and as additives in paint, carbonless copy paper, sealants and plastics. They are also released

as an unintentional by-product of combustion processes and certain organochlorine productions. The aforementioned HCB and Mirex are also classified as industrial chemicals.

c. Unintentionally Produced POPs:

11. Polychlorinated dibenzo-p-dioxins (PCDDs) *Listed under Annex C*

These chemicals are produced unintentionally due to incomplete combustion, as well as during the manufacture of certain pesticides and other chemicals. It was an unfortunate contaminant in some of the herbicide, Agent Orange, used in the Vietnam War. In addition, certain kinds of metal recycling and pulp and paper bleaching can release dioxins. Dioxins have also been found in automobile exhaust, tobacco, wood and coal smoke.

12. Polychlorinated dibenzofurans (PCDFs) *Listed under Annex C*

These compounds are often referred to as PCDFs and are produced unintentionally from the same processes that release dioxins. They are also found in commercial mixtures of PCBs. The aforementioned HCB and PCBs are also classified as unintentionally produced POPs.

1.2.3 Overview of the sixteen (16) new POPs under the Stockholm Convention

The Conference of the Parties fourth (4th) to eight (8th) meeting were held between 2009 to 2017, where they decided to amend Annexes A, B and C to the Convention by adding the following chemicals, several with exemptions:

1. **Alpha hexachlorocyclohexane (alpha-HCH) and 2. Beta hexachlorocyclohexane (beta-HCH) (added 2009)** *Listed under Annex A* have been produced as by-products of lindane production. For each tonne of lindane produced, around 6-10 tonnes of alpha- and beta-HCH are also produced. Therefore there are large stockpiles around lindane production leading to site contamination.
3. **Chlordecone (added 2009)** *Listed under Annex A* is a synthetic chlorinated organic compound, which was mainly used as an agricultural pesticide. It was first produced in 1951 and commercially introduced in 1958. Currently, no use or production of the chemical is reported, as many countries have already banned its sale and use. Alternatives to chlordecone exist and can be implemented inexpensively. Phasing out chlordecone further requires identifying and managing obsolete stockpiles and wastes.
4. **Decabromodiphenyl ether (Commercial mixture, c-DecaBDE); added in 2017** *Listed under Annex A* is used as an additive flame retardant and has a variety of applications including in plastics/polymers/composites, textiles, adhesives, sealants, coatings and inks. DecaBDE containing plastics are used in housings of computers and televisions (TVs), wires and cables, pipes and carpets. Commercially available DecaBDE consumption peaked in the early 2000's but c-DecaBDE is still extensively used worldwide. A number of non-POP chemical alternatives are already on the market for the substitution of c-DecaBDE in plastics and textiles. Furthermore, non-chemical alternatives and technical solutions such as non-flammable materials and physical barriers, respectively, are also

available. DecaBDE were listed only recently (05/2017) and has not been assessed within this NIP update.

5. **Hexabromobiphenyl (HBB), added 2009** *Listed under Annex A* is an industrial chemical that has been used as a flame retardant, mainly in the 1970s. According to available information, hexabromobiphenyl is no longer produced or used in most countries due to restrictions under national and international regulations. Alternatives to hexabromobiphenyl are available, so prohibiting its use and production is feasible and inexpensive.
6. **Hexabromocyclododecane (HBCD); 2013** *Listed under Annex A* has been widely used as a flame retardant additive on polystyrene materials in the 1980s as a part of safety regulation for articles, vehicles, and building insulations. There are already available on the market, chemical alternatives to replace HBCD in insulation foams, high-impact polystyrene (HIPS) and textile back coating.
7. **Hexabromodiphenyl ether and heptabromodiphenyl ether (octaBDE), (hexaBDE; heptaBDE); added 2009** *Listed under Annex A* The commercial mixture of OctaBDE contain the listed hexaBDE and heptaBDE and not-listed octaBDE and nonaBDE homologues. A main degradation pathway is through debromination which produces other bromodiphenyl ethers. The production of c-OctaBDE stopped globally in 2004 and alternatives generally exist. However, it is reported that articles in use still contain these chemicals.
8. **Hexachlorobutadiene (HCBd); added 2015** *Listed under Annexes A and C* is most commonly used as a solvent for other chlorine-containing compounds. Hexachlorobutadiene is generated as a by-product during the chlorinolysis in the production of both carbon tetrachloride and tetrachloroethene. These two commodities are manufactured on such a large scale, that enough HCBd can be separated as industrials (Secretariat of the SC 2017a). It seems that HCBd is no longer intentionally produced and used in the United Nations Economic Commission for Europe (UNECE) region including in the US and Canada; specific information on current intentional production and use and for the past 30 years is lacking. This indicates that substitution has taken place and alternatives are available.
9. **Lindane (gamma-HCH); added 2009** *Listed under Annex A* has been used as a broad-spectrum insecticide for seed and soil treatment, foliar applications, tree and wood treatment and against ectoparasites in both veterinary and human applications. The production of lindane has decreased rapidly in the last decades, due to regulations in several countries (also concerning its use and monitoring). However, a few countries are still known to produce it. Alternatives to lindane exist but are not readily available in some countries for the control of head lice and scabies. There are specific exemptions for use as a human health pharmaceutical to control head lice and scabies (as second line of treatment).
10. **Pentachlorobenzene (PeCB); added in 2009** *Listed under Annex A* previously, PeCB was used in PCB products, in dyestuff carriers, as a fungicide and a flame retardant. It might still be used as a chemical intermediate (e.g. for the production of quitozene). It is also produced unintentionally during combustion, thermal and industrial processes, and present under the form of impurities, in products such as solvents or pesticides. PeCB production ceased several decades ago in the main producing countries, as efficient and cost-effective alternatives became available. Best Available Techniques (BAT) and Best Environmental Practices (BEP) will significantly reduce the unintentional production of PeCB.

- 11. Pentachlorophenol (PCP) and its salts and esters; added 2015** *Listed under Annex A* has been used as herbicide, insecticide, fungicide, algacide, disinfectant and as an ingredient in antifouling paint (as a biocide). Some applications were in agricultural seeds, leather (preservative), wood preservation, cooling tower water, rope and paper mill systems. Its use has significantly declined due to the high toxicity of PCP and its slow biodegradation. It was first produced in the 1930s and it is marketed under many trade names. The main contaminants include other polychlorinated phenols, polychlorinated dibenzo-p-dioxins, (PCDDs), and polychlorinated dibenzofurans (PCDFs). Both chemical and non-chemical alternatives exist for PCP. The applications for utility poles and cross arm bars have been exempted for use.
- 12. Perfluorooctane sulfonic acid (PFOS), its salts and perfluorooctane sulfonyl fluoride (PFOS, its salts and PFOF); added 2009** *Listed under Annex B* is both intentionally produced and is an unintended degradation product of related anthropogenic chemicals. The current intentional use of PFOS is widespread and includes: electric and electronic parts, firefighting foam, photo imaging, hydraulic fluids and textiles. PFOS is still produced in several countries. While alternatives to PFOS are available for some applications. This is not always the case in some developing countries, for example, alternatives to PFOS for the control of leaf cutting ants is not available.
- 13. Polychlorinated naphthalenes (PCNs); added 2015** *Listed under Annexes A and C* were added to cables for insulating coating for electrical wires. Others have been used as wood preservatives, as rubber and plastic additives, for capacitor dielectrics and in lubricants. To date, intentional production of PCN is assumed to have ended. PCNs are unintentionally generated during high-temperature industrial processes in the presence of chlorine. Within the UNECE region, the information on substitution and alternatives is extremely limited, as PCNs are not in use anymore. The only available information is that, since the production of PCNs has stopped in the 1970s and 1980s, PCNs have been substituted by other chemicals. These chemicals have not been identified and described (UNECE 2007).
- 14. Short-chain chlorinated paraffins (SCCPs); added 2017** *Listed under Annex A* can be used as a plasticizer in rubber, paints, adhesives and flame retardants for plastics as well as an extreme pressure lubricant in metal working fluids. Chlorinated paraffins are produced by chlorination of straight-chained paraffin fractions. The carbon chain length of commercial chlorinated paraffins is usually between 10 and 30 carbon atoms. Short-chained chlorinated paraffins are between 10 and 13 carbon atoms. The production of SCCPs has decreased globally as jurisdictions have established control measures. While technically feasible alternatives are commercially available for SCCPs in industrial countries a range of exemptions have been included in the convention for transition in developing countries. SCCPs listed only recently (5/2017) have not been assessed within this NIP update.
- 15. Technical endosulfan and its related isomers; added in 2011** *Listed under Annex A* is an insecticide that has been used since the 1950s to control crop pests, tsetse flies and ectoparasites of cattle and as a wood preservative. As a broad-spectrum insecticide, endosulfan is currently used to control a wide range of pests on a variety of crops including coffee, cotton, rice, sorghum and soy. Chemical and non-chemical alternatives to endosulfan are available in many geographical situations both in developed and developing countries. Some of these alternatives are being applied in countries where endosulfan has been banned or is being phased-out.
- 16. Tetrabromodiphenyl ether and pentabromodiphenyl ether (tetraBDE and pentaBDE respectively); added 2009** *Listed under Annex A* PBDEs inhibit or suppress combustion in organic

materials and therefore are used as additive flame retardants. The production of commercial PentaBDEs in the United States (US) ceased at the end of 2004 (US-EPA, 2013). Alternatives are available and used to replace these substances in many countries, although they might also have adverse effects on human health and the environment. The identification and also handling of equipment and wastes containing brominated diphenyl ethers is considered a challenge.

Additional information on POPs alternatives is available on the Stockholm Convention webpage².

1.3 SAINT KITTS AND NEVIS NATIONAL IMPLEMENTATION PLAN (NIP)

1.3.1 Purpose of the NIP on Persistent Organic Pollutants

The Saint Kitts and Nevis NIP on POPs for 2014-2024 is a comprehensive document outlining the effective management of POPs in the Federation of Saint Christopher (Saint Kitts) and Nevis. As a party to the SC, Saint Kitts and Nevis is required to prepare a plan on how it will implement the obligations under the Convention and make efforts to implement the plan.

The NIP is not a standalone plan but it forms part of and is guided by the strategies for economic diversification and social development as articulated in the National Adaptation Strategy (NAS) in response to the New European Union (EU) Sugar Regime 2006-2017.

1.3.2 NIP update/development methodology

The update and development of the National Implementation Plan is guided by the “Interim Guidance for Developing National Implementation Plans for the Stockholm Convention”³.

The process of updating the NIP consists of five (5) phases:

Phase I – Establishment of a Coordinating Mechanism and Organization Process

In order to successfully update a NIP it requires that an effective project planning and management structure be put in place. Phase I lays out the steps to provide a firm base from which to update the NIP.

The NIP update in Saint Kitts and Nevis was part of GEF #5558 project for the Development and Implementation of a Sustainable Management Mechanism for POPs in the Caribbean, in an attempt to advance the commitments of participating States to the SC and improve their capacities and capabilities to manage POPs and other toxic chemical substances.

² Information on POPs alternatives:

<http://chm.pops.int/Implementation/Alternatives/Overview/tabid/5834/Default.aspx>

³ UNEP/POPs/COP.1/INF/13: Interim Guidance for Developing National Implementation Plans for the Stockholm Convention

Global Environment Facility (GEF) approved funding for the project in 2015. It was executed by BCRC-Caribbean and the Caribbean Public Health Agency (CARPHA) was contracted as the technical consultant to execute Output 1.1 of the project (update of the NIP including conduct of in-country inventories including new POPs added to the SC).

A coordinating mechanism was initiated to guide the process of formulating, verifying and approving the NIP update (as well as POP inventory process). This mechanism included the Project Working Committee (PWC) and the National Focal Point (National Project Coordinator) and was headed by the PWC Chair. The PWC consisted of multisectoral representation from government ministries/agencies and key stakeholder groups.

The key objectives of this phase of the project included:

- raising awareness within Government departments, ministries, and agencies of the POPs issue, the SC, new POPs added to the Convention, and the need to update the NIP;
- raising awareness of the POPs issue with non-governmental stakeholders;
- achieving sufficient political commitment to enable the successful updating of the NIP;
- establishing a structure and mechanisms for planning, managing, and supervising the updating of the NIP;
- developing a work plan for updating the NIP; and
- planning, initiating, and sustaining an information dissemination campaign.

Phase II – Establishment of POPs Inventories and Assessment of National Infrastructure and Capacity

The key objectives of this phase of the project included:

- obtaining, reviewing and summarizing information on the sources, use, and production of POPs, including gathering information on presence in stockpiles and wastes, and determine the baseline situation;
- identifying gaps in resources, capacity and knowledge that prevent the complete assessment of the status of POPs;
- determining if the requirements of the Stockholm Convention are met;
- fulfilling reporting obligations under the SC;
- identifying technical and financial assistance needed to complete the update and implementation of the NIP;
- facilitating coordination and integration with national sustainable development, chemicals management and pollution control policies;
- facilitating coordination, as appropriate, with activities addressing other multilateral environmental agreements (MEAs), e.g. Rotterdam and Basel Conventions.

Inventories for the three (3) groups of POPs - pesticides, industrial POPs and unintentional POPs (UPOPs) (listed in the SC) - were developed based on the current situation of POPs in Saint Kitts and Nevis. Four (4) inventory reports (Pesticides, PBDE, PFOS and UPOPs) were generated and the PCBs was addressed using the Rapid Assessment and Inventory of Stored PCB Oil and PCB Contaminated Equipment for Disposal (BCRC-Caribbean, 2016). The inventories and rapid assessment were related to sources, use, production, presence of stockpiles and waste.

Information was gathered from the key stakeholders and the national partners including public and private sector agencies, non-governmental organizations (NGOs) and regional partners. For each group of POP chemicals the gaps in resources, capacity and knowledge were included. Additionally, these inventories included information on general chemical management and pollution control and related policies in the countries. The guidance for the development of inventories came from the Stockholm Convention, United Nations Environment Programme (UNEP) guidance documents.

The development the POPs inventories consisted of five (5) steps:

1) Planning the inventory

This first step was the planning phase which involved identification of the stakeholders and major professional users of POPs and related substances in Saint Kitts and Nevis. Additionally, both the national inception meeting (in Trinidad, November 08 – 11, 2016) and the National POPs Initiation Workshop (February 07, 2017) contributed to defining the inventory objectives.

The POPs Initiation Workshop in Saint Kitts and Nevis signalled the commencement of the development of the POPs inventories. The participants of the workshop included officials from Government, the private sector and NGOs. Personnel from CARPHA, the BCRC-Caribbean and the Saint Kitts and Nevis Bureau of Standards (SKNBS) facilitated the workshop. The objective of the workshop was to raise awareness at the national level of POPs and provide exposure to stakeholders on the process and methodology for developing and updating the national POPs inventories (with special emphasis on the fourteen (14) new POPs listed 2009-2015 and not considering the two (2) POPs listed in 2017).

2) Choosing the data collection methodology

A Tier Approach was used as the method to collect data. The approach involved consisted of different levels of complexity, ranging from the use of statistics (at the lower level) to resource-intensive data collection and country specific measurements (high level). In this step an initial assessment was conducted which was achieved through literature reviews, consultations, face-to-face/telephone interviews, surveys, use of statistics and site visits with the relevant stakeholders. Data was also collected from the POPs Initiation Workshop through the working group session.

Site inspections were conducted as necessary (higher level data collection), however, there was not capacity or in-country facilities to conduct sampling and country specific measurements/testing in Saint Kitts and Nevis.

3) Collecting and compiling data from key sectors

This step involved compiling all the collected data considering the current status of the old and the new POPs.

4) Managing and evaluating the data

In this step the compiled information was analyzed and evaluated. This involved identifying data gaps, limitations and validating information. In addition, assumptions were documented the data format and estimations were determined.

5) Preparing the inventory report

In this final step, the compiled data was analyzed, evaluated and reported to give current information on the old POPs and information on the management of the newly added POPs. This Draft Inventory Report was then validated and endorsed at the Regional POPs Inventories Validation Workshop.

The Regional POPs Inventories Validation Workshop was held in Saint Kitts and Nevis (November 16-17, 2017) and signalled the validation and endorsement of the POPs inventories for Saint Kitts and Nevis and all the other participating countries. The important considerations during the inventory validation process were as follows: use of representative data, appropriate conclusions, address of reviewers' (CARPHA, PWC, Project Management Unit (PMU) of BCRC-Caribbean) comments/queries and approval of draft reports by both the BCRC-Caribbean and the PWC. However, due to the limited capacity for POPs monitoring, the inventories are rather semi-quantitative or qualitative. Also inventory guidance documents were not available at the time of inventory development for the POPs listed in 2015 (PCNs, PCP and HCBP) and the information gathered can be considered as preliminary.

Phase III – Priority Assessment and Objective Setting

The priority assessment of the individual POP groups was based on key information on POPs, the POPs situations in the country (using the findings from the POPs inventories), the relevance to the region and where appropriate, relevance of available data on POPs levels in human milk or blood. The major criteria for the assessment of the individual POPs were toxicological relevance to human health and biota/wildlife, relevance of co-pollutants and affected waste, and socio-economic relevance.

The approach to priority assessment and objective setting was one which engaged the national partners and key stakeholders in priority setting and action planning for POPs during two (2) one-

day consultation workshops (February 14, 2018 in Saint Kitts and February 15 2018 in Nevis).

The key objectives of this phase of the project included:

- developing country-specific criteria for prioritizing health and environmental impacts of POPs;
- assessing the available information from Phase II in order to identify priority areas for attention;
- identifying data and other gaps in the information available that prevents a full priority assessment from being carried out;
- reviewing national priorities and making adjustments accordingly; and
- setting appropriate short term and longterm objectives, goals and measurable indicators for the management of POPs in compliance with the SC as well as using the Rotterdam and Basel Conventions as a means for the identification and proactive/preventive action to effectively manage chemicals with POPs-like characteristics.

Phase IV – Formulation of The National Implementation Plan

The key objectives of this phase of the project included:

- gathering information on possible options for management of POPs;
- prioritising the options available and actions necessary to meet the requirements of the SC and country objectives;
- updating the draft NIP suitable for the country to meet the needs of the SC and specific objectives and priorities, coordinated with national activities on sustainable development and related goals, where appropriate; and
- identifying the requirements for assistance in the completion of additional assessments and information gathering to complete and implement the NIP.

The status of POPs in Saint Kitts and Nevis was one of the most important components that informed the formulation of the NIP. Information from the Inventory reports (POP-pesticides, POP-PBDEs/HBCDs, PFOS, PCDDs/PCDFs and other UPOPs) and the PCB rapid assessment report gave information on the areas of concern related to POPs, the needs and gaps related to POPs management in the country. The National Stakeholder Consultation Workshops (described in phase II) provided the forum for the PWC and key stakeholders to prioritise the POPs (according to the findings of the inventories, the country needs and its obligations under the SC), and develop action plans for managing POPs in Saint Kitts and Nevis.

The previous NIP was used as the foundation for the current NIP update. Relevant information was retained and data gathered from the National Stakeholder Consultation Workshops and

through other communication with the PWC, NPC and or the PWC Chair, were all incorporated into the update.

Phase V – NIP Endorsement and Submission

The key objectives of this phase of the project included:

- clearly communicating the scope, the need for purpose and value of the NIP;
- consult with all stakeholders on the proposed NIP, as appropriate;
- finalize the NIP, taking account of stakeholder input;
- secure political support and endorsement by the relevant authorities for the NIP and its implementation; and
- transmitting an agreed revised and updated NIP to the Conference of the Parties (COP) of the Convention.
- establishing and putting into practice a mechanism for periodic updating and review of the NIP in accordance with Article 7 of the Convention;
- establishing a mechanism for reporting to the COP as required; and
- putting in place the mechanism for implementation of the NIP.

During the Regional Inventories Validation Workshop and later at the Validation Workshop on the Update of the NIP, CARPHA presented a communication framework to facilitate endorsement of the updated NIP. The NPC and the PWC Chair of Saint Kitts and Nevis as well as the other seven (7) participating countries and the BCRC-Caribbean representatives, evaluated, commented and made recommendations for the framework. The main objective of this framework was to provide government/agencies with strategies to effectively communicate the updated NIP on POPs to the Cabinet for endorsement. The framework included examples of communication materials to be developed, an approach to developing these materials with the countries, the communication strategies to engage/encourage “buy-in” of the NIP at the different levels of government and challenges in communicating the NIP update.

The NPC, PWC Chair and PWC of Saint Kitts and Nevis participated in consultations (face-to-face and online) on the preferred products and provided information on their endorsement process. The communication product (Cabinet Brief) was developed and submitted to NPC and PWC chair of Saint Kitts and Nevis.

After the updated NIP is endorsed by the Cabinet, Saint Kitts and Nevis would be responsible for transmitting it to COP through the established mechanism for reporting to SC. Additionally, as part of the project, Saint Kitts and Nevis (as with all participating countries) will be provided with a framework to monitor their implementation of the NIP.

1.3.3 National Implementation Plans and Socio-economic Assessment

Socio-economic assessment (SEA) provides information on the social, cultural, economic and political conditions of individuals, households, groups, communities and organizations. In the context of POPs, POPs-like chemicals and other toxic chemicals, this is an assessment of the potential social impacts of economic or other activities that the management of POPs may have on all sectors of the society. It allows for the analysis and management of both positive and negative social impacts of the interventions undertaken (policies, programmes, plans, and projects) and any social change processes invoked by those interventions.

Annex F to the SC ‘Information on socio-economic considerations’ provides an indicative list of items to be taken into consideration by Parties when undertaking an evaluation regarding possible control measures for chemicals being considered for inclusion into the Convention. This annex also states that: “An evaluation should be undertaken regarding possible control measures for chemicals under consideration for inclusion in this Convention, encompassing the full range of options, including management and elimination. For this purpose, relevant information should be provided relating to socio-economic considerations associated with possible control measures to enable a decision to be taken by the Conference of the Parties”.

After conducting the assessment of the potential impacts, a SEA assists in deciding on and choosing actions that are appropriate and correctly focused as well as monitoring their effectiveness. It also provides a basis for minimising the negative impact on populations and also in improving equitable outcomes for the most vulnerable groups.

In the context of managing POPs, social and economic impacts might include:

- Vulnerability arising from exposure to POPs.
- Deterioration or improvement in health.
- Loss or improvement in livelihoods.
- Changes in cost of living.
- Changes in employment, income, and workplace protection.
- Levels of child labour.
- Changes in levels of equity of wealth distribution.
- Opportunities for enterprise development (including Small and Medium Enterprises).
- Changes in demand for public services, such as health, education, and infrastructure.

When developing the NIP the following considerations need to be addressed:

Impact on people as well as the environment

The socio-economic assessment ensures that the management of POPs takes into account the impact of proposed management strategies on the well-being of all sectors of a community,

particularly the most vulnerable. The data generated by a SEA will inform the NIP and implementation teams, enabling them to analyse, monitor, and manage the social consequences of action on POPs.

Obligations under the Stockholm Convention

Throughout the text of the Stockholm Convention references are made to socio-economic assessment. These references indicate the importance of a socio-economic assessment when implementing the obligations under the Convention and when developing the updated NIP. Furthermore, the Global Environment Facility (GEF) 2020 longterm strategy suggests aligning global environmental objectives with national and global socioeconomic development priorities. This can be considered, where appropriate, also on a national scale.

1.3.4 Gender policy in the NIP development and implementation

Gender consideration is a key variable in the NIP development and it needs to be considered when planning. There are efforts to integrate an explicit gender dimension into the SC. This gender dimension is very important in every aspect and at every level of chemicals management since in everyday life, men, women, and children are exposed to different kinds of chemicals in varying concentrations.

Biological factors, notably size and physiological differences between women and men and between adults and children, influence susceptibility to health effects from exposure to toxic chemicals. Also, social factors, primarily gender-determined occupational roles have an impact on the level and frequency of exposure to toxic chemicals, the kinds of chemicals encountered, and the resulting impacts on human health.⁴

Consistent with the GEF Policy on Gender Mainstreaming and the GEF-6 approach on gender mainstreaming, GEF projects (funded under this strategy) will not only acknowledge gender differences within their design, but determine what actions are required to promote both women's and men's roles in chemicals management, disproportionate chemical exposure and vulnerability, as well as sustainable alternatives.

For the NIP update project as well as the inventory development, efforts were made to balance genders involvement during all aspects of the projects. All workshops and activities including prioritising POPs, action planning, validating activities, etc., reflected a balance in gender.

⁴ United Nation Development Programme, Gender Mainstreaming. A Key Driver of Development in Environment and Energy, Energy and Environment Practice. Gender Mainstreaming Guidance Series;

1.3.5 Structure and content of the NIP

The NIP comprises of three (3) chapters:

Chapter 1 defines POPs and explains the effects of these chemicals on human health and the environment. This chapter also gives an introduction about the SC and its goals and provisions. In addition, it describes the development and the structure of the NIP.

Chapter 2 outlines Saint Kitts and Nevis' demographic, political and economic status. It elaborates on the environmental situation and the current status of the institutional, policy and regulatory framework. This chapter also presents the results of the assessment of POPs, focusing on the import and export, production, current and future use, registration, release, storage, disposal and the potential impact. The existing monitoring programme and the information exchange and awareness are also described in this chapter.

Chapter 3 outlines the recommended activities, strategies and action plan elements of the NIP. In addition, there is a budget related to the activities of the action plan. It also presents development and capacity-building proposals and priorities, timeframe for plan implementation and measures of success and resource requirements.

2 COUNTRY BASELINE

2.1 PROFILE OF SAINT KITTS AND NEVIS

2.1.1 Geography and population

Geographical Context

The twin island Federation of Saint Kitts and Nevis (also known as Saint Christopher and Nevis), consists of two (2) islands located in the northern part of the Lesser Antilles chain of islands in the Eastern Caribbean. Saint Kitts is located at latitude 17° 15' north and longitude 62° 45' west and Nevis is located two (2) miles (3 km) to the southeast, at 17° 10' north and longitude 62° 35' west (see Figure 2.1).

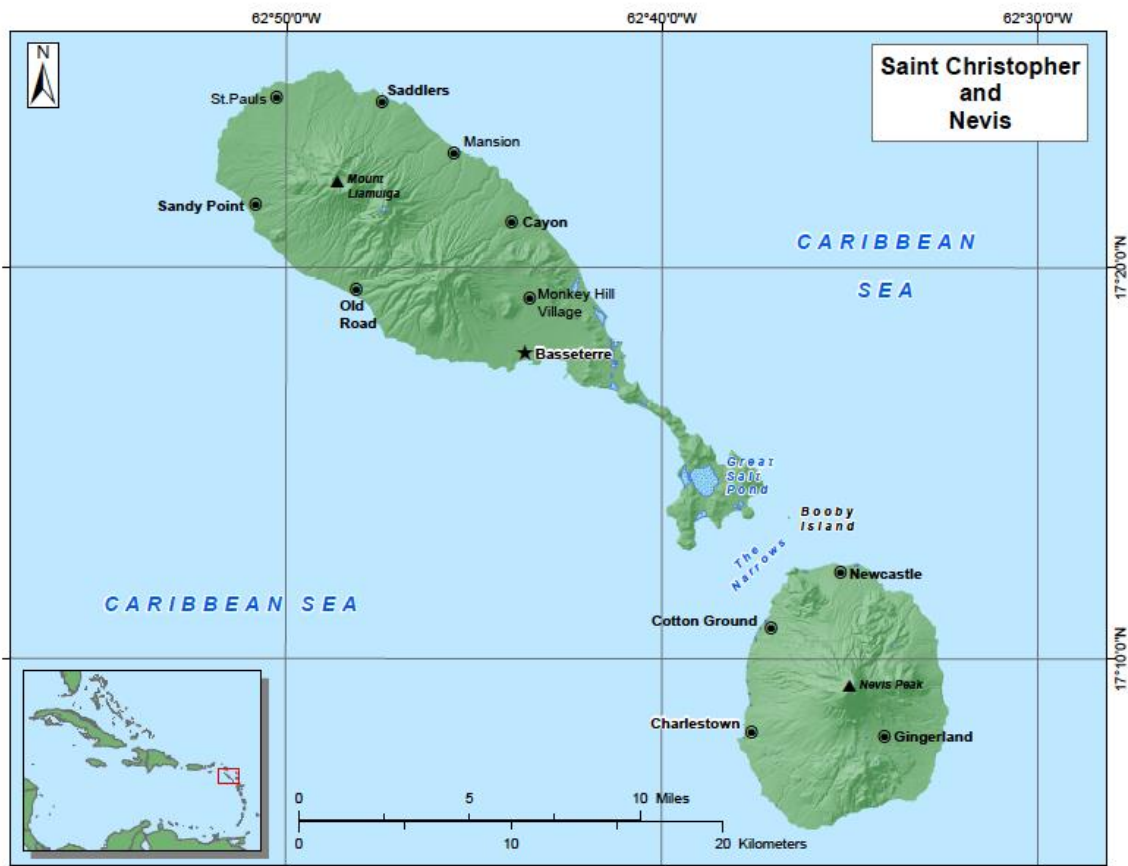


Figure 2-1: Map of the Caribbean showing the location of Saint Kitts and Nevis.

The Federation of Saint Kitts and Nevis has a land area of 269 sq. km. (104 sq. miles). The larger of the two (2) islands, Saint Kitts is 176 sq. km. (68 sq. mi.) in area. It is approximately 36.8 km (23 mi) long and is roughly oval in shape with a narrow neck of land extending like a handle from the southeastern end. Nevis has an area of 93 sq. km. (36 sq. mi), with a length of 12.3 km (7.64

mi) and a width of 9.6 km (5.96 mi) at its widest point. Both islands are volcanic in origin, with central mountain ranges that dominate the landscape and radiate downward to the coasts.

Population

According to the World Bank, the population of Saint Kitts and Nevis for 2016 was 54,821. About 78% of the population lives on the island of Saint Kitts and 22% lives on the island of Nevis. The majority of the population resides in the main towns, Basseterre (and its environs) in Saint Kitts and Charlestown in Nevis. The median age was 31.5 years old.

The Government of Saint Kitts and Nevis (GSKN) has been committed to social protection as a key component of national poverty reduction for a long time. Social assistance programmes have been implemented since the 1960s and social assistance legislation from 1977. Other legislation giving social protection (social welfare, labour market policies to vulnerable groups - women, youth and children) has been in place since the 1980's (Saint Kitts and Nevis NIP, 2014).

Over the years the social protection system has been extended both horizontally (the benefits offered and vulnerabilities covered) and vertically (the levels of coverage). However, it is not adequately serving the current needs and is inadequate for future needs (Saint Kitts and Nevis NIP, 2014). Two (2) Country Poverty Assessments have been conducted in Saint Kitts and Nevis, one in year 1999/2000 and another in 2007/2008. They show that during the 7-year interval, significant gains were made in respect of poverty reduction in the Federation. The poverty rate in the 2007/2008 survey was 23.7% for Saint Kitts and 15.9% for Nevis.

The overarching national development frameworks that prioritise social protection strengthening as key to poverty reduction and equitable social development are outlined as follows:

- The National Adaptation Strategy (NAS) (2006 to 2017) highlights the important function social protection plays in establishing equitable social development;
- The National Poverty Reduction Strategy (NPRS) (2011 to 2015) has two (2) of its five (5) priority areas focusing on social protection. Priority area four (4) is concerned with strengthening social safety net systems and Priority area five (5) covers risk reduction and social protection.

To effect the strengthening of social protection in the Federation, the GSKN embarked on social protection reform which has been guided by the findings and recommendations outlined in the following documents:

- The Social Safety Net Assessment 2009 (SSNA) Report which presented an assessment of the social protection framework, focusing on non-contributory programmes. It catalogued the existing social assistance benefits and schemes and identified the gaps and weaknesses in the framework. It made recommendations for the reform of the social assistance

framework; some of which are relevant to social protection programmes generally. It also highlighted the need for greater policy coherence between contributory and non-contributory sectors. It concluded that a good safety net system evolves over time and that the time was ripe to rethink the design and implementation of social assistance in Saint Kitts and Nevis. It clearly indicated that reforms recommended in the SSNA will require considerable commitment and resolve from GSKN.

- The National Social Protection Strategy and Plan of Action, 2012-2017 (NSPS) is designed to set the main priorities for social protection strengthening and guide the establishment of a sustainable, comprehensive and integrated Social Protection System. The NSPS was prepared under the leadership of the Ministry of Social Services, Community Development, Culture and Gender with support from the United Nations Children’s Fund (UNICEF) and the United Nations Entity for Gender Equality and the Empowerment of Women (UNWOMEN). It takes into consideration the findings and recommendations of the SSNA, and critically analyses the social protection landscape in Saint Kitts and Nevis, including its international obligations under human rights treaties, and the legislative framework under national legislation. It highlights key weaknesses, and presents a vision and goals for social protection, and a roadmap for social protection reform in two phases:
 - Phase 1 (2012–2015): aimed at consolidating and strengthening the social safety net programmes for improved efficiency and effectiveness; and
 - Phase 2 (2016–2017): aimed at wider reforms for establishing a coherent and integrated social protection system.

The NSPS includes an action plan to achieve those goals. The priority actions for Phase 1 include the legislative review and reform of the Social Development Assistance Act to modernise the institutional and administrative arrangements for social assistance programming and policy making. The parameters for the social protection reform are also influenced regionally and internationally (Saint Kitts and Nevis NIP, 2014).

2.1.2 Membership in regional and sub-regional organizations

Saint Kitts and Nevis is a member of several regional and sub-regional organizations including the following:

- The Caribbean Community (CARICOM), which rests on four main pillars: economic integration; foreign policy coordination; human and social development; and security.
- The Organisation of Eastern Caribbean States (OECS), an inter-governmental organisation dedicated to economic harmonisation and integration, protection of human and legal rights, and the encouragement of good governance between countries and dependencies in the Lesser Antilles in the Eastern Caribbean. It also performs the role of spreading responsibility and liability in the event of natural disaster.

- The Caribbean Public Health Agency (CARPHA) a regional inter-governmental agency with the purpose of drawing together and building on public health knowledge and expertise across the Caribbean, preventing duplication of effort and resources. This will facilitate a coordinated approach to public health issues including managing the risk of disease outbreaks in the Caribbean region.
- The United Nations (UN), an intergovernmental organization tasked to promote international cooperation and to create and maintain international order.
- The CARICOM Regional Organisation for Standards and Quality (CROSQ), a regional inter-governmental organisation established to facilitate the development of regional standards, promote the harmonization of metrology systems and support the sustainable production and trade of goods and services.
- The Caribbean Disaster Emergency Management Agency (CDEMA), a regional inter-governmental agency for disaster management in the Caribbean Community. CDEMA is the regional disaster management body playing the role of facilitator, driver, coordinator and motivating force for the promotion and engineering of Comprehensive Disaster Management (CDM) in the region.
- The Bolivarian Alliance for the Americas, an intergovernmental organisation organization based on the idea of the social, political and economic integration of the countries of Latin America and the Caribbean.
- The Commonwealth of Nations, an intergovernmental organisation of fifty-three (53) member states that are mostly former territories of the British Empire. The Commonwealth operates by intergovernmental consensus of the member states, organised through the Commonwealth Secretariat and non-governmental organisations, organised through the Commonwealth Foundation.
- The World Trade Organization, an intergovernmental organisation that regulates international trade.
- The Regional Security System (RSS), an international agreement for the defence and security of the eastern Caribbean region.
- The Food and Agriculture Organization (FAO), of the United Nations a specialised agency that leads international efforts to defeat hunger.

2.1.3 Political and economic profile

Political profile

The Federation of Saint Kitts and Nevis is a parliamentary democracy, which consists of a constitutional monarchy, with the Governor General representing Queen Elizabeth II as its Head of State. The Head of State acts on the advice of the Prime Minister and Cabinet. The Prime

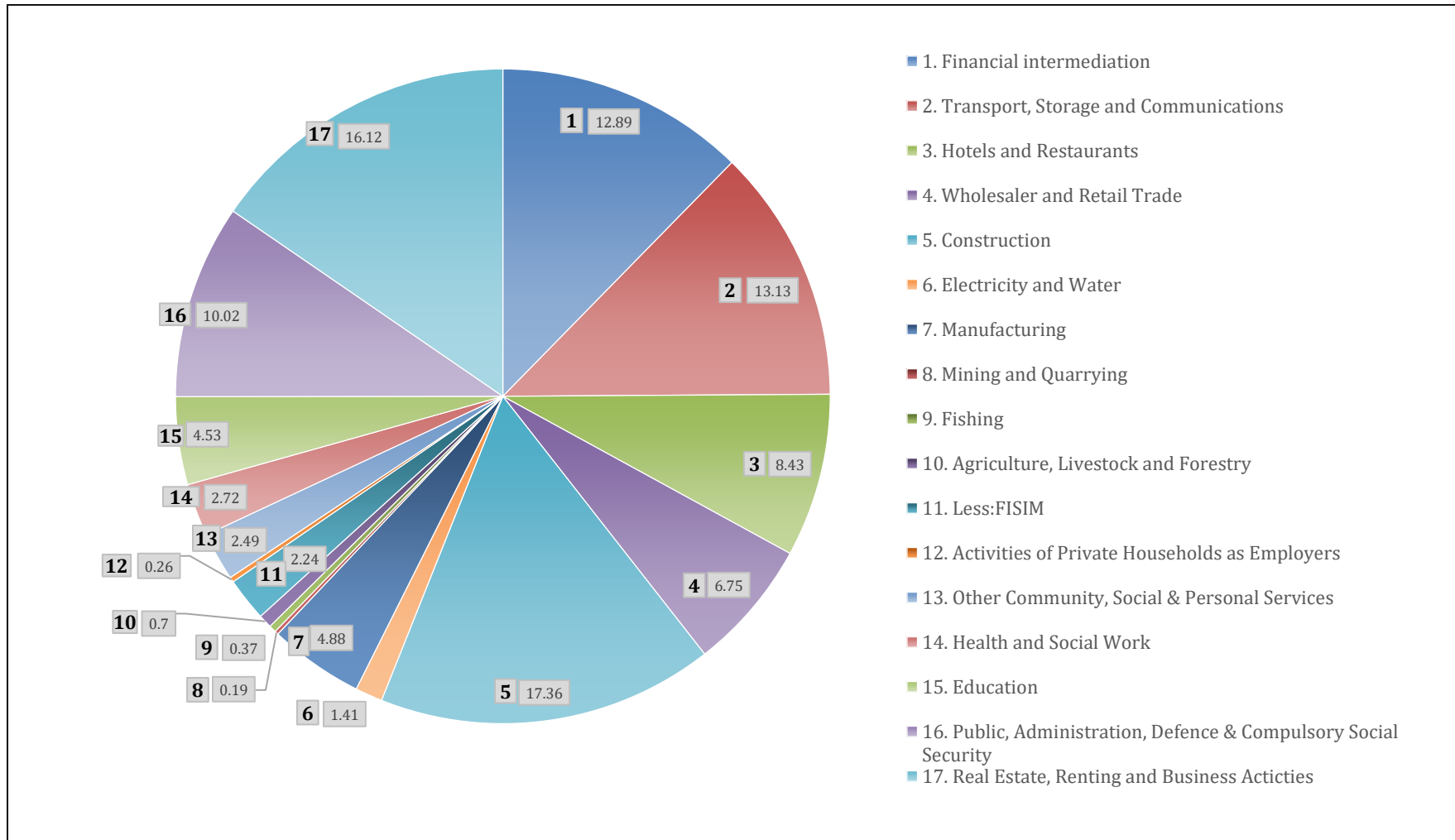
Minister is the leader of the majority party of the House, and the cabinet conducts affairs of the state. The country has a single National Assembly, comprised of fourteen (14) members; eleven (11) of these members are directly elected representatives, eight (8) of whom represent constituents in Saint Kitts and three (3) represent Nevis. The other three (3) members are appointed senators; two (2) appointed on the advice of the prime minister and the other by the opposition leader.

Economic profile

The twin island Federation of Saint Kitts and Nevis is a small, open, high income economy historically dependent on sugar production which dominated the socio-economic landscape for more than 300 years. In 2005, the centuries-old sugar industry, which had been operating at a loss and challenged by increased trade liberalisation and competition in the global economy, was closed, providing the opportunity for social and economic reconstruction and transformation. Recognising the significant growth potential, the Government identified Agriculture Diversification, Tourism, Information and Communication Technology and Financial Services as the primary pillars for economic growth and development. These sectors are supported by strategic actions in the Education, Health and Social Development sectors and focused interventions have been executed to facilitate environmental protection, public sector reform, private sector development, infrastructure for development and regional integration. Saint Kitts and Nevis has attained the strongest growth and fiscal performance in the Eastern Caribbean Currency Union (ECCU) region in recent years. In 2016, the gross domestic product (GDP) grew by 3.2% driven by positive growth levels in the wholesale and retail trade (10.3%), construction (7.6%), real estate, renting and business services (2.8%), and financial intermediation (2.7%) sectors. Growth in the construction sector can be attributed to the advancement of work on a major hotel while, the outturn for the wholesale and retail trade sector was due to the continued activity in the construction sector, domestic demand for consumer goods and the growth in the tourism sector.

Consumer inflation in 2016 was negative, reflecting the favourable tax environment and low international fuel prices, but end-year inflation turned positive as these effects started to subside. Public debt continues its downward trajectory as the debt-to-GDP ratio in 2016 was 66% and is projected to reach the ECCU debt-to-GDP target (60%) in 2018, well ahead of ECCU agreed period.

The development of offshore education as an industry has also been encouraged and is expected to develop the economy even further.



(Adapted from: Saint Kitts Strategy & Action Plan for Agriculture (2017-2021))

Figure 2-2 Saint Kitts & Nevis Contribution of Gross Domestic Product by Economic Activity 2015.

2.1.4 Profiles of economic sectors

Tourism

The economy of Saint Kitts and Nevis has continued to depend largely on tourism and related services to generate growth in recent years. The hotel and restaurant sector have been identified as critical to future growth prospects. As a result, accommodation capacity is currently being built and the country has been able to attract significant foreign direct investment (FDI).

The tourism sector is the main foreign exchange earner for Saint Kitts and Nevis. Tourism to the islands has been expanding since 1978. In 2009 there were 587,479 arrivals to Saint Kitts compared to 379,473 in 2007. This growth represents an increase of just less than 40% in a two-year period. Recent growth in tourism has been fuelled by an increase in cruise ship and stay-over visitors. In July 2018, Saint Kitts and Nevis welcomed its one millionth cruise passenger for 2017-2018 cruise season, which runs November to September. Tourism has spill-over effects on the rest of the economy, for example in road transportation. The sector is among the parts of the economy that have experienced most growth in gross value added in recent years.

Agriculture

In 1977, the agricultural sector contributed 5.3% to the GDP (in constant 2006 dollars) of Saint Kitts and Nevis. By 1990, this contribution fell to 2.1% and this value declined steadily. By 2015, provisional estimates of the contribution of the agricultural sector to GDP in constant dollars, was 0.7%, which is approximately 13% of its 1977 contribution. Much of this decline was due to the ending of sugarcane production. While this aspect of the economic status of agriculture fell sharply, this sector continues to be a significant direct and indirect labour employer, especially in the rural districts of Saint Kitts. By 2015, the Construction Sector dominated the economic activities, accounting for 17.6% of real GDP. This was followed by Real Estate, Renting and Business Activities, accounting for 16.1% of real GDP.

Agriculture, measured by its sub-sectoral composition of crop, livestock, fisheries and forestry, contributes 4% or less to the GDP in Saint Kitts and Nevis. Despite this relatively small share, primary agriculture has exhibited the capacity to generate high rates of growth. This was evident between 1999 and 2008, when despite bouts of economic recession (such as in 2001-2002) and slow growth (between 2007 and 2008), growth in primary agriculture was substantially higher than national growth. Good performers, notably tomato, carrot and pumpkin, sweet and white potatoes and goat and sheep, provide a firm platform for investment and growth in agriculture.

The overall decline in the contribution of agriculture is also due to numerous challenges of low on-farm productivity, high pest and disease incidence for crops and livestock, poor marketing arrangements, damage from tropical storms, droughts and crop damage by monkeys.

2.1.5 Environmental overview

Saint Kitts and Nevis has a fairly advanced environmental policy framework. The Government of Saint Kitts and Nevis has expressed its commitment in becoming the smallest “green” nation in the world. In its Medium Term Economic Strategy Paper (2003 – 2005), the Government expressed its commitment to exploring alternative sources for electricity generation and introducing economic incentives for the renewable energy sector (Saint Kitts and Nevis Minamata Initial Assessment Report, 2018).

The economy and quality of life in Saint Kitts and Nevis are largely dependent on the capacity of its terrestrial and marine ecosystems to continue to provide ecosystem services. Ecosystem services take many forms: provisions from natural systems (seafood, wood and plants from gully ecosystems) and altered agro-ecosystems; protection of the seashore provided by reefs and coastal vegetation; sand generation by reefs; and non-extractive-use services that support income-generating activities such as snorkelling, scuba diving, hiking and sightseeing (IDB, 2013).

2.2 INSTITUTIONAL POLICY AND REGULATORY FRAMEWORK

This subchapter describes the present overall institutional, policy, and regulatory framework within which the NIP will be implemented. It also covers more detailed baseline information about the management of POPs chemicals such as key approaches and procedures for enforcement and monitoring requirements in Saint Kitts and Nevis.

2.2.1 Environmental policy, sustainable development policy and general legislative framework

Presently, Saint Kitts and Nevis has no policy that is specifically aimed at addressing POPs; however, the general environmental policies/strategies are relevant:

- **National Adaptation Strategy**
 - maintenance of macro-economic stability to reduce vulnerability and facilitate investment;
 - improve competitiveness in the production and export of goods and services;
 - adaptation of social policies to support economic development and protect the most vulnerable;
 - promotion of a sustainable development agenda;
 - restructuring and transformation of the economy;
 - development of appropriate legal and regulatory frameworks; and
 - efficient provision of public goods (such as education and health).

- **National Environmental Management Strategy (NEMS)**

The Government of Saint Kitts and Nevis adopted the NEMS in April 2005. The NEMS defines the specific directions and mechanisms for more effective policy implementation and includes specific actions necessary and results expected to realize the policy objectives of the government. NEMS articulates the key strategies and priority actions for environmental management in the context of sustainable development. The NEMS seeks to:

- foster sustainable improvement in the quality of life;
- integrate social, economic and environmental considerations into National Development Policies, Plans and Programmes;
- improve on legal and institutional frameworks;
- ensure meaningful participation by civil society in decision-making;
- use economic instruments for sustainable environmental management;
- foster broad-based environmental education, training and awareness;
- address the causes and impacts of climate change;
- minimize and manage the causes and impacts of disaster;
- prevent and control pollution and manage waste;
- ensure the sustainable use of natural resources;
- protect cultural and natural heritage;
- protect and conserve biological diversity;
- recognize relationships between trade and environment;
- promote cooperation in science and technology;
- manage and conserve energy; and
- negotiate and implement multi-lateral environmental agreements

- **National Environmental Management Strategy and Action Plan (2005-2009)**

The Saint Kitts and Nevis National Environmental Management Strategy and action plan (2005-2009) sets out actions and strategies to guide agencies in implementing the principles of the Saint George's Declaration (2000), the benchmark environmental management framework in the Organization of Eastern Caribbean States region. The NEMS sets out 48 environmental management strategies arranged in sections corresponding to 17 of the Declaration's 21 principles, as well as specific activities that support these strategies and the agencies responsible for implementing them. The NEMS is intended to "guide programmes in environmental management over the long term". At the end of its five-year period of applicability, agencies are expected to review progress on implementation and plan for another five-year cycle.

- **Saint Kitts Strategy & Action Plan for Agriculture (2017-2021) (SKSAP)**

SKSAP 2017-2021 which was developed by the Ministry of Agriculture, Health, National Health Insurance, Human Settlement, Community Development, Gender Affairs, Social Services, Cooperatives and Lands, together with the Department of Agriculture (DoA) is the successor of

the Saint Kitts and Nevis Agricultural Development Strategy (2013-2016). The implementation, monitoring and evaluation processes are essential elements of the SKSAP.

There are were seven (7) priority areas identified in the SKSAP:

- **Priority Area 1:** Create an Environment for Agribusiness to be More Productive and Profitable via Capacity Building and Innovation
- **Priority Area 2:** Enhance National Food and Nutrition Security with Emphasis on Food Safety
- **Priority Area 3:** Assist in Development of Value Added Chains Domestic and Export
- **Priority Area 4:** Develop and Strengthen Appropriate Institutional Structures Mechanisms and Human Resource Capacities
- **Priority Area 5:** Create an Environment to Attract and Retain Youth and Women Involvement in Agriculture
- **Priority Area 6:** Adopt an Integrated Water Resource Management Approach
- **Priority Area 7:** Reduce Crop and Livestock Losses
- **Priority Area 8:** Adopt and Develop Measures to Adopt and Mitigate to Climate Change

The various actions identified under each priority area will be largely carried out under the existing four (4) core programmes, which are:

1. Operation food security (OFS)
2. Farming for agricultural systems transformation (FAST)
3. Agricultural risk management and climate change adaptation
4. Agribusiness systems & market integration (Hutchinson, 2016)

- **National Physical Development Plan (2006-2021)**

The 2006 National Physical Development Plan (NPDP) describes the policy directions the Government of Saint Kitts and Nevis will take towards realization of the achievement of sustainable development goals for the island of Saint Kitts. The NPDP looks at sustainable development policies for the different sectors of the economy against the dual backdrop of a proposed “growth pole” strategy and environmental concerns. It describes what the Government has done for sustainable development and what it proposes to do to ensure the continued growth of the economy, the protection of the environment and the provision of an improved quality of life for its citizens in the future.

- **Medium-Term Economic Strategy**

The Medium-Term Economic Strategy Paper (MTESP) sets out policies and approaches which the Government of Saint Kitts and Nevis will pursue to sustain growth and development. The plan identifies tourism as the “main engine of economic growth”. It also notes that the government is wholly committed to sustainable development and that there is a need for legislation that will address coastal zone and watershed management.

2.2.2 Roles and responsibilities of ministries, agencies and other governmental institutions involved in POPs life cycles (from source to disposal, environmental fate and health monitoring)

A number of institutions have been given legal mandates at varying levels to manage and/or regulate toxic chemicals including POPs within the Federation. The roles and responsibilities of ministries, agencies and other governmental institutions involved in management of toxic chemicals are described in this section.

Government agencies with lead chemicals management roles:

The Pesticides and Toxic Chemicals Control Board (PTCCB)

The PTCCB has the responsibility for the regulation and control of the importation, storage, manufacture, sale, transportation, disposal and use of pesticides and toxic chemicals (Saint Kitts and Nevis Country Report, 2018).

Saint Kitts and Nevis Ministry of Health

This Ministry is responsible in part for organizing and developing its resources to ensure a healthy population (Saint Kitts and Nevis Country Report, 2018).

Saint Kitts and Nevis Customs and Excise Department

The Customs and Excise Department is a Government agency with the responsibility of protecting the country from potential risks arising from international trade and travel, while facilitating the legitimate movement of people and goods across the border.

As the nation's gatekeepers, the Department uses intelligence and risk assessment to select and target our physical checks of containers, vessels or travellers. The Department also conducts investigations and audits, and prosecutes offenders who breach Customs Laws and other Government regulations. Customs also exercises controls over restricted and prohibited imports, including pornography, drugs, firearms and harmful substances, such as hazardous waste and ozone-depleting products.

Saint Kitts and Nevis Bureau of Standards

The Saint Kitts and Nevis Bureau of Standards (SKNBS) was officially established on the 8th day of March 1999 and has the major responsibility of protecting the environment, health and safety of consumers. Its activities also focus on preparing, promoting and generally adopting standards on a national, regional or international basis relating to structures, commodities, materials, articles and other things offered to the public commercially, hence promoting standardization, quality assurance and simplification in industry and commerce.

The SKNBS has been appointed as the:

- Official Contact Point and the National Focal Point under the Stockholm Convention;

- National Focal Point under the Minamata Convention on Mercury;
- National Focal Point for the Strategic Approach to International Chemicals Management (SAICM); and
- National Enquiry Point to World Trade Organization regarding Technical Barriers to Trade.

Government Agencies with supporting roles:

Ministry of Sustainable Development (Saint Kitts) and the Department of Physical Planning, Natural Resources and Environment (Nevis)

The Ministry of Sustainable Development is the primary entity charged with providing economic advice and related information, which would enable Government and the private sector to formulate policies and successfully execute plans for the social, physical, economic and environmental development of the country.

Within the Ministry, the Department of Economic Affairs and Public Sector Investment Planning (PSIP) houses the Global Environment Facility (GEF) Operational Focal Point. The Ministry's chemicals related functions include issuing permits; and regular operations include working with the Customs and Excise Department (Saint Kitts and Nevis Country Report, 2018).

The Department of Physical Planning, Natural Resources and Environment in Nevis has as one of its mandates, the promotion of policies, strategies and programmes to enhance the protection, conservation and the sustained development and management of the island's natural and environmental resources, including the monitoring of environmental quality, conservation and preservation of critical environmental areas.

Ministry of Agriculture, Human Settlement, Cooperatives and Environment

The Ministry of Agriculture has the duty to provide and maintain a high level of productivity and client-focused service to support government's vision and commitment to realise a transformed society and economy with a modern and diversified agricultural sector, a sustainable marine resources sector and an inclusive and participatory approach to good governance. The Department of Environment houses the National Focal Point under the Basel Convention. The Department of Agriculture serves as the Designated National Authority under the Rotterdam Convention.

Solid Waste Management Corporation (SWMC)

The Solid Waste Management Corporation, created under the act of Parliament on July 24, 1996, took responsibility for solid waste management on Saint Kitts (OECS Ship and Waste Management, 2003). The Saint Kitts SWMC and the Nevis Solid Waste Management Authority (NSWMA) are responsible for the transportation, processing, treatment, disposal and storage of waste on Saint Kitts and on Nevis, respectively. These organisations are not directly involved in the management of POPs but are responsible for operating the two (2) main landfill sites - Conaree

Landfill (Saint Kitts) and Low Ground Landfill (Nevis) - which are potential sources of POPs disposed with the waste and UPOPs formed from landfill fires.

Fire and Rescue Services

Roles and functions of the Fire and Rescue Services Department on POPs:

- Educate the general public on the effects, symptoms and toxicity of pollutants.
- Training of general public on personal protections against an emergency involving POPs.
- Create a specialized task force to respond to and provide assistance in the event of a POPs related emergency.
- Have the capabilities to effectively extinguish any fire involving POPs using the most updated skills and techniques with modern equipment. This would also include identifying and using the proper extinguishing media.
- Identify probable high-risk area (s) that is/are susceptible to dangerous exposure in the event of an incident or accident involving POPs.
- Enacting/recommending policies and regulations for the storing, handling and transportation of toxic chemicals.
- Establishing Standing operating procedures (SOP) for POPs emergencies.
- Identifying possible evacuation routes and areas for high-risk areas.
- Implementing an efficient alert system for the general public if a/sectorial or mass evacuation is to be mandated.
- Conducting periodical drills with other stakeholders for POPs related emergencies.
- Policing of regulation via inspection based on stated regulated time frame.
- Posting of chemical air monitors in areas as recommended and mandated by law (if may) of the state.

2.2.3 Relevant international commitments and obligations

Environmental degradation has always been a concern of the Government of Saint Kitts and Nevis. In order to improve efforts to protect nature the Government has committed to the implementation of several multilateral environmental agreements (MEA) and procedures aimed at bringing about sound chemicals management. The Conventions that are most relevant to POPs management are the Stockholm Convention on Persistent Organic Pollutants, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal and the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade and will be explained in this section.

The Basel Convention

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, which came into force in May 1992, seeks to “protect, by strict control, human health and the environment against the adverse effects which may result from the generation and management of hazardous wastes and other wastes”.

A central goal of the Basel Convention is the environmentally sound management of hazardous waste. To this end, the Convention establishes a system to control the transboundary movement of hazardous waste and requires all Parties to report on the generation, export and import of wastes covered by the Convention. Parties can also access, via the Secretariat or one of the Regional Centres for Training and Technology Transfer, technical assistance and training in the management and minimisation of hazardous wastes.

All of the chemicals included in the Stockholm Convention, on becoming wastes, are subject to the controls of the Basel Convention. Specifically, the Basel Convention governs the management, movement and disposal of the following types of POPs wastes:

- Wastes, substances and articles containing, consisting of or contaminated with polychlorinated biphenyl (PCB) ... polychlorinated naphthalene (PCN) or polybrominated biphenyl (PBB), or any other polybrominated analogues of these compounds, at a concentration level of 50 mg/kg or more;
- Wastes ... including waste pesticides and herbicides which are off-specification, outdated, or unfit for their originally intended use;
- Wastes that contain, consist of or are contaminated with ... any congener of polychlorinated dibenzo-furan [or] any congener of polychlorinated dibenzo-dioxin.

The Basel Convention Secretariat has issued a wide range of guidelines and training manuals to instruct and assist countries in the environmental sound management of hazardous wastes, including the general technical guidelines for the environmentally sound management of wastes consisting of, containing or contaminated with POPs.

The Rotterdam Convention

Saint Kitts and Nevis is Party to the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals in International Trade, which came into force in February 2004. The Convention creates legally binding obligations for the implementation of the Prior Informed Consent (PIC) procedure. It built on the voluntary PIC procedure, initiated by UNEP and FAO in 1989 and ceased on 24 February 2006. The PIC procedure is “a means for formally obtaining and disseminating the decisions of importing countries as to whether they wish to receive future shipments of specified chemicals and for ensuring compliance with these decisions by exporting countries”.

The Rotterdam Convention’s aim is “to protect human health, including consumers and workers, and the environment against potentially harmful impacts from certain hazardous chemicals and pesticides in international trade”. To achieve this aim, two (2) main objectives have been identified:

- To promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm; and
- To contribute to their environmentally sound use, by facilitating exchange about their characteristics, by providing for a national decision-making process on their import and export, and by disseminating these decisions to Parties.

2.2.4 Description of existing legislation and regulations addressing POPs (manufactured chemicals and unintentionally produced POPs)

The production of POPs has never occurred in Saint Kitts and Nevis and no future production is anticipated. Presently, there is no existing legislation and regulations specifically addressing the management of toxic chemicals. In the absence of such legislation, however, there are several laws and regulations, which address, in part, the current chemical-related issues in the country. Arguably, the most important piece of legislation dealing with chemicals in Saint Kitts and Nevis is the Pesticides and Toxic Chemicals Control Act Cap 9.18 of 2009. This section reviews the legislations related to POPs and other chemicals in Saint Kitts and Nevis.

Pesticides and Toxic Chemicals Control Act Cap 9.18 of 2009

The Pesticides and Toxic Chemicals Control Act Cap 9.18 of 2009, which is described as “an Act to provide for the regulation and control of the importation, storage, manufacture, sale, transportation, disposal, and use of pesticides and toxic chemicals” currently, regulate pesticide use. Under the Act, a Pesticides and Toxic Chemicals Control Board (PTCCB) has been established. The Board is responsible for advising the Minister on the making of regulations and carrying out the provisions of the Act and its Regulations.

Under Section 5, the functions of the PTCCB include determining applications for registration, licences and research permits; granting or cancelling registrations, licences and permits; monitoring the implementation of regulations; and furnishing such information, reports, and returns as required by the Minister. The Minister may appoint a registrar of pesticides and toxic chemicals with the responsibility for, inter alia, co-ordinating the staff of the PTCCB; keeping and maintaining registers of licensees, toxic chemicals, and pest control operators.

National Conservation and Environment Protection Act No. 5 of 1987 (NCEPA)

The NCEPA is described as an “Act to provide for the better management and development of the natural and historic resources of Saint Kitts and Nevis for purposes of conservation: the establishment of national parks, historic and archaeological sites and other protected areas of natural or cultural importance including the Brimstone Hill Fortress National Park; the establishment of a Conservation Commission; and for other matters connected thereto”.

Under the NCEPA, the Department of Physical Planning and Environment (DPPE) for purposes of conservation and environmental protection in Saint Kitts and Nevis was established. The Act allows the Minister to make any regulations in relation to any matter pertaining to environmental protection and conservation. These include:

- a. to initiate, oversee, co-ordinate, integrate, regulate, facilitate and monitor environmental protection and conservation strategies and measures in Saint Kitts and Nevis;
- b. to initiate and implement environmental policies, programmes and projects in order to achieve sustainable development in Saint Christopher and Nevis;
- c. to oversee environmental policies, programmes and projects undertaken by other departments and ministries of the Government of Saint Christopher and Nevis;
- d. to negotiate environmental treaties initiated by regional and international inter-governmental organizations;
- e. to provide information, data statistics and reports to several inter-governmental organizations and non-governmental organizations; and
- f. to work in close collaboration with non-governmental organizations with a view to ensuring their support for conservation and environmental protection in Saint Christopher and Nevis.

Pollution is described as any direct or indirect alteration of the physical, thermal, chemical, biological or radioactive properties of any part of the environment by the discharge, emission, or the deposit of wastes so as to affect any beneficial use adversely or to cause a condition which is hazardous to public health, safety or welfare, or to animals, birds, wildlife, marine life or to plants of every description.

The Act prohibits any offence which has caused significant deterioration, damage or destruction of trees, shrubs, grass planted or laid out, mangroves, coral reefs, beaches, bays or pollution of any part of the coastal zone.

Draft National Conservation and Environmental Management Bill, 2017

The draft National Conservation and Environmental Management Bill 2017 seeks to revise and replace the current NCEPA. The Bill retains and updates many of the conservation and heritage related sections that are currently part of the NCEPA; more importantly, it also adds a section dealing with the prevention and control of environmental pollution (Saint Kitts and Nevis Country Report, 2018).

Once enacted, the National Conservation and Environmental Management Act (NCEMA) would allow the Minister responsible for the Environment, in consultation with the Conservation Commission, to designate protected areas. Schedule 1 lays out the various classes of protected

areas and their purposes. Part IV sets out requirements for management of protected areas. The Commission would assist in the selection of protected areas and the maintenance and development of the national parks in Saint Kitts and Nevis. The Act also calls for the Department of the Environment's collaboration with the Department of Physical Planning and Development Control to develop strategies to promote environmentally sound and sustainable development in areas adjacent to protected areas. The NCEMA would update and modify the NCEPA. Among other things it provides for the development of coastal zone management plans.

Part XI of the draft Act specifically relates to pollution control. By section 73(1) the Minister may by regulations:

- a. Designate as a pollutant any substance, thing or man-made phenomenon (including energy, noise, vibration, electro-magnetic or ionizing radiation, colour or temperature variation) which, in a specified quantity or concentration or condition, is likely to cause harm to human health or affect the quality of the environment.
- b. Prescribe allowable standards of pollution and in so doing may prescribe different standards for the deposit, release or escape of pollutants on or into land, water or the air or within different geographical areas.

In accordance with section 73(2) unauthorized deposit, release or escape of pollutants into the environment in excess of allowable standard of pollution applicable to the receiving environment is prohibited. However section 73(2) would depend on regulations having first been promulgated under section 73(1).

Under section 77(1) if any part of the environment is found to have been polluted before the coming into force of this Act, the Department may by notice served under that person, required any person who it finds to have been solely or partly responsible for causing or allowing that pollution to take place to take such measures to clean up or rehabilitate the environment as the Department may specify.

By section 79(1) the Minister may by regulations:

- a. designate specific substances as hazardous substances: and
- b. prescribe procedures for the safe storage, handling, use and disposal of such substances.

Under section 92 the International Conventions listed in Schedule 2 have the force of law in Saint Kitts and Nevis. Among the Conventions listed in Schedule 2 is the Basel Convention on the Control of Transboundary Movement of Hazardous Waste. As the draft Act is not yet finalized the Minamata Convention on Mercury could be added as one of the listed Conventions.

Under section 93 the Minister may make regulations to give effect to the International Conventions specified in Schedule 2.

Similarly section 98 allows the Minister to make regulations for a wide range of matters including regulations for the implementation of the Environmental Conventions to which Saint Kitts and Nevis is a party.

By section 94 the Minister may from time to time amend, add or remove any convention in Schedule 2 by way of Notice to be published in the *Gazette*.

National Bureau of Standards Act

The National Bureau of Standards Act makes provision for the preparation, promotion and control of standards in relation to commodities, services and practices and also to establish a National Bureau of Standards.

The functions of the Bureau of Standards are broadly set out in section four (4) of the Act. These are broad functions and include the following:

- a. to prepare, promote and generally adopt standards on a national, regional or international basis relating to structures, commodities, materials, articles and other things offered to the public commercially;
- b. to promote standardization, quality assurance and simplification in industry and commerce;
- c. to maintain testing laboratories for the purpose of testing and providing facilities for examining commodities, products, materials, processes, and practices and in so doing to conduct such research and investigations as may be necessary;
- d. to certify those products, commodities and processes that conform to national standards; and
- e. to coordinate the efforts of producers and users of materials, products, appliances, processes and methods, for the improvement of the materials, products, appliances, processes and methods.

Under section 18 of the Act inspectors (appointed under section 17) have wide powers to enter premises where commodities are manufactured, prepared, packaged, stored or kept for export or imported for sale where there is a mandatory standard in respect of such a commodity. The inspectors are also empowered to test any commodity detained by them in accordance with section 18 and to take samples of such commodities.

Biosafety Act No. 14 of 2012

The Biosafety Act No. 14 of 2012, is described as, “an Act to provide for the movement, transit, handling and use of genetically modified organisms resulting from modern biotechnology that may have adverse effects on conservation and sustainable use of biological diversity, taking also into account risks to human health”. Under the Act, the Biosafety Board has been established. The Act

makes no direct mention of POPs toxic chemicals, but deals with management of general health matters and public nuisances.

Solid Waste Management Act No. 11 of 2009

The Solid Waste Management Act No. 11 of 2009 is described as an “An Act to provide for the management of solid waste in conformity with the best environmental practices; and to provide for related or incidental matters”. It is currently the legal instrument governing the management of solid waste in Saint Kitts and Nevis.

The Act redefined the functions of the SWMC. The SWMC shall, among other things, undertake and complete an inventory and characterizations of solid waste generated in Saint Kitts and Nevis and prepare a National Waste Management Strategy. The SWMC shall also designate a list of activities for which the grant of a permission of the planning authority and an environmental impact assessment is required. The Act defines duties and liabilities of waste management license holders in relation with emergencies and disasters. The SWMC shall be capable of holding, purchasing and otherwise acquiring and disposing of any property, movable or immovable, for the purpose of carrying out its duties under this Act.

The SWMC shall generally be responsible for overseeing the management of the solid waste collection and disposal systems in the islands of Saint Christopher and Nevis, and without prejudice to the generality of the foregoing the SWMC shall, in particular;

- a. provide storage facilities for solid waste;
- b. procure equipment for the collection, transportation and disposal of solid waste;
- c. provide collection and storage facilities at ports, harbours, and anchorages for the reception of ship-generated waste before transportation to the final disposal sites;
- d. procure equipment necessary for the transportation of ship-generate waste to the final disposal sites;
- e. convert existing dumps into sanitary landfills;
- f. develop and manage new sanitary landfill sites and other disposal methods;

- g. provide facilities for the treatment and disposal of medical and hazardous waste;
- h. introduce measures aimed at encouraging recovery of recyclable items from solid waste;
- i. introduce cost recovery methods for services provided by the SWMC;
- j. prepare plans and programmes to address the problems of solid waste management in Saint Christopher and Nevis;
- k. manage and direct the implementation of the OECS Waste Management Project and any other approved regional and international activities.

The SWMC shall ensure the broadest consultation in the preparation of the National Waste

Management Strategy, and in particular, but without prejudice to the generality of the foregoing, shall consult with the Scheduled agencies and the waste management policy stakeholders to the extent that their interests are, in the opinion of the SWMC, likely to be affected.

Customs (Control and Management) Act

The Customs (Control and Management) Act provides a comprehensive legal framework for customs management in Saint Kitts and Nevis. The Act covers a range of matters: Administration (Part II), Customs Controlled Areas (Part III), Importation (Part IV), Exportation (Part V), Coastal Trade (Part VI), Warehousing, (Part VII), Duties Drawbacks, Prohibitions and Restrictions (Part VIII), Powers (Part IX), Offences (Part X), Legal Proceedings, Forfeiture, Sale of Goods (Part XI), Determination of Disputes (Part XII) and Miscellaneous (Part XIII).

Section 84(1) provides that no goods, class or description of goods, prescribed in Part I of the Fourth Schedule shall be imported into Saint Kitts and Nevis. Similar prohibitions are contained in section 84(2), 84(3) and 84(4) in regard to goods prescribed in Part II, Part III and Part IV of the Fourth Schedule, respectively.

Development Control and Planning Act (2000)

The purpose of the Development Control and Planning Act (DCPA) is to assist in the orderly, efficient, and equitable planning, allocation and development of the resources of Saint Christopher. The DCPA's definition of land includes submerged land extending to seaward limit of territorial sea, which the Maritime Areas Act sets at 12 miles seaward of a landward baseline. Thus, development occurring thereon may only proceed with permission of the Development Control and Planning Board created by the Act.

The Development Control and Planning Board is also responsible for preparing development plans. Development plans may provide for zoning, allocate land for the protection of marine life, and/or protect the coastal zone (defined as extending to seaward limit of the territorial sea).

In carrying out its duties (i.e. producing development plans), the Board may designate comprehensive planning areas for conservation and other purposes and may designate environmental protection areas. For both, in consultation with Minister Responsible for NCEPA, the Board is responsible for developing management plans.

Management plans may contain special resource and use areas in which the Minister (in consultation with the minister responsible for NCEPA) may permit and prohibit certain activities, such as designating protected swimming and surfing areas; designating anchoring, mooring, and beaching areas; and designating where water-skiing, wind-surfing, or other water sports may occur. Management plans may also arrange for protection of marine flora and fauna, and specifically provide for the regulation of hunting and fishing to achieve this purpose.

Section 51 of the Act allows the Development Control and Planning Board to prepare and submit to the Minister a draft amenity order where it considers that any land is:

- a) Unsightly and injurious to the amenity of the area, and visible to persons using a public road or any other area to which the public has a right of access; or
- b) Likely to be or is offensive to persons residing in the immediate neighbourhood of such land, by reason of any waste, rubbish, derelict or abandoned machinery or articles or materials of any kind, or the dilapidated state of any structure or building thereon.

An Amenity Order shall state, *inter alia*, (i) any matter that is required to be cleared; (ii) in the case of an order requiring clearance, the matter which must be destroyed, or the place, being an authorized place for the disposal of rubbish, to which it must be removed as appropriate.

By section 51(4) where a draft Amenity Order is approved by the Minister, the approved Amenity Order shall be served on the owner or occupier of the land concerned.

National Disaster Management Act of St Christopher and Nevis No.5 of 1998

The Natural Disaster Management Act of Saint Christopher and Nevis, No.5 of 1998 is described as an “An Act to provide for the effective management and control of disasters, and to provide for related or incidental matters”. In the Act, ‘disaster management’ is defined to encompass “all aspects of preparedness, prevention, mitigation, planning, control, response and recovery as they relate to natural and technological disasters”. There is provision made for the establishment of a National Disaster Management Agency, a corporate body for coordinating the general policy of the Government of the Federation of Saint Kitts and Nevis in relation to disaster management. The Agency is governed by a Board of Directors {no more than nine (9) members}, all of whom are appointed by the Prime Minister of Saint Kitts and Nevis.

Public Health Act (2002)

The Public Health Act makes provisions for a wide range of public health matters. By section 2 of the Act the Minister is vested with the following powers:

- the prevention, treatment, limitation and suppression of disease, including the conduct of investigations and inquiries in respect of such diseases;
- the publication of reports, information and advice on public health, including the education of the public and the promotion and preservation of health;
- the abatement of nuisances and the removal or correction of any condition that may be injurious to the public health;
- (subject to the provisions of any law dealing with the distribution and price of goods) the importation of food and drugs and the sale and conditions of sale of foods and drugs; and

- the administration of the Act Under section 2 of the Act “nuisance” includes any act not warranted by law, or any omission to discharge a legal duty, which act or omission causes inconvenience or interferes with personal comfort, or is likely to be prejudicial to the public health or public safety.

Section 10 of the Act empowers the Minister to make a wide range of Regulations under the Act. Among the Regulations made under the Act are the following:

- Public Health (Offensive Trades) Regulations
- Public Health (Collection and Disposal of Refuse) Regulations
- Food Regulations
- Public Health (Nevis) Regulations

Under regulation 6 of the Public Health (Collection and Disposal of Refuse) Regulations, the Minister may approve the installation and operation of incinerators. Regulation 8 prohibits the deposit of any discarded fluorescent lighting tubes or aerosol containers in any refuse intended or likely to be burnt but shall dispose of the same by burial or in any other manner in place approved by the Minister. By regulation 20 no person shall burn refuse at any place or in any manner likely to create a health hazard or nuisance. In addition regulation 8 prohibits the burning of any material likely to cause excessive smoke, or to liberate any toxic substance.

Fisheries Aquaculture & Marine Resources Act - No. 1 of 2016

Fisheries Aquaculture & Marine Resources Act - No. 1 of 2016 aims “to provide for the conservation, management, development and sustainable use offisheries, aquaculture and marine resources of Saint Christopher and Nevis, to monitor and control Saint Christopher and Nevis fishing vessels beyond the fisheries waters, to repeal the Fisheries Act 1984 and for related matters”.

Merchant Shipping Act, 2002

Of particular relevance to marine zoning, the Act provides for registration of vessels; prevention of collisions and safety of navigation; the establishment and management of aids to navigation; and prevention of pollution from ships.

Saint Christopher Air and Sea Ports Authority Act (2002)

The Port Authority Act creates the Saint Christopher Air and Sea Ports Authority and Nevis Air and Sea Ports Authority, which are responsible for developing an integrated system of lighthouses, ports, and port services, and regulating navigation to the ports.

The Port Authority, with the approval of the Minister of Finance, has the authority to make regulations concerning the [...] (c) controls and prohibitions on the doing or omission of anything

or class of things within the limits of any port; (d) the regulation, restriction and control (without prejudice to the conduct of navigation) of the depositing of any substance, solid matter, article or thing polluting or likely to cause pollution of the waters of any port; and (e) the regulation of traffic and navigation of ships within the limits and approaches to a port and all matters relating to the protection of life and property (Saint Kitts and Nevis Minamata Initial Assessment Report Draft, 2018).

Plant Protection (Cap 14.09) Act of 2002

The Plant Protection Act (Cap 14.09) of 2002 is described as an “Act to make provision for the protection of plants against certain diseases; and to provide for related or incidental matter”. In the control of the spread of pests, various pesticides may have to be used to effect said control and as such, the Act has implications for the use of measures to eradicate diseases and pests, which may include the use of fumigants, some of which may be POPs-like.

Animals (International Movement and Diseases) Act No. 1 of 1987

The Animals (International Movement and Diseases) Act No. 1 of 1987, is described as an “Act to control the importation into Saint Christopher and Nevis and to regulate the movement from Saint Christopher and Nevis of animals, birds, fish, insect and reptile and of animal carcasses, parts and meats, veterinary biological products, litter and fodder for the purposes of preventing the introduction of disease into Saint Christopher and Nevis and into other Member States of the Caribbean Community and of providing for the safe and humane movement of animals from Saint Christopher and Nevis and for other matter related thereto or connected therewith”. The Act does not make any special provisions to animal and meat contamination by substances, the provision is made for regulations to be made on the declaration of additional pests and diseases of animals, which may be of concern and could have some impact on the management of POPs as it relates to animals.

2.2.5 Key approaches and procedures for POPs chemical and pesticide management including enforcement and monitoring requirements

In Saint Kitts and Nevis POPs chemicals and pesticides are managed by the Pesticides and Toxic Chemicals Control Board (PTCCB), which was established by the Pesticides and Toxic Chemicals Control Act Cap 9.18 of 2009. The Act provide for the regulation and control of the importation, storage, manufacture, sale, transportation, disposal, and use of pesticides and toxic chemicals (refer to Section 2.2.4).

The functions of the Board are to:

- a. determine any application submitted to it for: i. Registration, ii. Licenses, iii. Research Permits;
- b. grant or cancel any registration, license or permit in accordance with the provisions of the

Act;

- c. advise the Minister on matters relevant to the making of regulations under the Act;
- d. monitor the implementation of regulations made under the Act; and
- e. furnish such information, reports and returns that the Minister may, from time to time, require.

There is a list of approved chemicals (including pesticides), which can be imported after obtaining a license from the Board. The Board must first review unlisted pesticides then the decision is conveyed to the applicant/general public. Once approved the applicants are then required to apply for an importation license.

2.3 ASSESSMENT OF THE POPS ISSUE IN THE COUNTRY

The assessment of the POPs issue in Saint Kitts and Nevis is based on inventories (2016) of: pesticides, polychlorinated biphenyls (PCBs), polybrominated diphenyl ethers (PBDEs) and unintentionally produced POPs (UPOPs: polychlorinated dibenzo-para-dioxins (PCDD)/polychlorinated dibenzofurans (PCDF), and hexachlorobenzene (HCB)). A summary of the information collected in the inventories is described in this section. It presents information on the current POPs stockpiles, contaminated areas and waste, prediction of future POPs production, use and release, POPs monitoring capacity, and provisions for sharing information and raising public awareness.

2.3.1 Assessment with respect to Annex A, part I chemicals (POPs pesticides): historical, current and projected future production, use, import and export; existing policy and regulatory framework; summary of available monitoring data (environment, food, humans) and health impacts.

There are sixteen (16) POP pesticides listed in the SC. The original nine (9) POP pesticides (Aldrin, Chlordane, DDT, Dieldrin, Endrin, Heptachlor, HCB, Mirex, Sulfluramide (PFOS precursor) and Toxaphene) listed in Annex A of SC (for elimination) were part of the “dirty dozen”. In 2009, 2011 and 2015, amendments were made and seven (7) new POP pesticides (alpha-HCH, beta-HCH, Chlorodecone, Lindane, Pentachlorobenzene (PeCB), Endosulfan and PCP) were added to the SC.

Production and/or use of the initially and newly listed POP pesticides

There is no production of POP pesticides in Saint Kitts and Nevis. The PTCCB is the agency responsible for approval of imports of all pesticides entering Saint Kitts and Nevis.

There is no data on the historic use of the old POP pesticides in Saint Kitts and Nevis. However, the registration of POP pesticides started in the mid-1990s. Table 2-1 gives the status of POP pesticides in Saint Kitts and Nevis.

Table 2-1: Status of POP pesticide use in Saint Kitts and Nevis.

POP Pesticide	Status in Saint Kitts and Nevis
Aldrin	Banned
Alpha-HCH and beta-HCH	Not registered for use
Chlordane	Banned
Chlordecone	Not registered for use
Dieldrin	Banned
Endrin	Banned
Endosulfan	Not registered for use.
Heptachlor	Banned
Hexachlorobenzene	Banned
Pentachlorobenzene	Banned
Mirex	Not registered for use.
Toxaphene	Banned
Pentachlorophenol	PCP treated utility poles no longer imported; historic use of these poles is unknown, current poles are not treated with PCP.
DDT	Banned
Lindane	Banned; alternatives used are Permethrin Benxyl/ Benzoic Acid

Source: (CARPHA, 2017a)

Policy and regulatory framework

In Saint Kitts and Nevis there is no legislation that deals specifically with the management of POPs pesticides. However, all of the pesticides are regulated under the Pesticides and Toxic Chemicals Control Act Cap 9.18.

Monitoring Data

The Caribbean EcoHealth Programme's (CEHP's) conducted a study of human exposure to POPs and other toxicants (mercury, lead and pesticide metabolites) in the CARICOM region and more specifically Saint Kitts and Nevis (Table 2-2) (Caribbean EcoHealth Programme, 2012). The results of the study showed that mothers from Saint Kitts and Nevis were exposed to very low concentrations of POPs (Forde & Dewailly, 2012).

Table2-2: Summary of the finding of a study of human exposure to POPs in Saint Kitts and Nevis.

Indicator	Concentration
Persistent Organic Pollutants (POPs)	(N=44)
PCB 118(µg/L)	0.02
PCB 138 (µg/L)	0.03
PCB 153 (µg/L)	0.07
PCB 156 (µg/L)	N/A
PCB 170 (µg/L)	0.02

Indicator	Concentration
PCB 180 (µg/L)	0.04
Hexachlorobenzene (µg/L)	0.05
p,p'-DDE (µg/L)	0.04
p,p'-DDT (µg/L)	0.01
Ratio p,p'-DDE/p,p'-DDT	3
HCH (µg/L)	N/A
trans-Nonachlor (µg/L) 0.01	0.01
Dioxin (pg/g lipid) 4.50	4.5
Polybrominated flame retardants (PBDEs)	(N=10)
PBB 153	0.0013
PBDE 100	0.0027
PBDE 153	0.0026
PBDE 17	0.002
PBDE 47	0.0083
PBDE 99	0.0027

(Adapted from: Forde & Dewailly, 2012)

Potential health impacts

Exposure to pesticides can occur directly from occupational, agricultural and household use, and indirectly through the diet. Studies suggest that pesticides may be related to various diseases, including cancers, as well as having neurological, mental and reproductive effects.

Children may be more susceptible to the effects of pesticides due to increased exposure via food and breast milk, underdeveloped detoxification pathways, and longer life expectancy in which to develop diseases with long latency periods (Cohen, 2007).

2.3.2 Assessment of Polychlorinated biphenyls (PCBs) (Annex A, Part II chemicals)

Most countries and inter-governmental organisations have banned or severely restricted the use, handling, and transport of PCBs. However, equipment in use and waste containing PCBs are still commonly found in many countries. Such equipment and waste containing PCBs include several groups; capacitors, solvents, end of life vehicles, demolition waste, oils (dielectric fluids), electrical cables insulated by polymers.

Production, import, and use

Electrical power is generated by the Saint Kitts Electricity Company (SKELEC) and in Nevis by the Nevis Electricity Company (NEVLEC) by diesel-fuelled generators. Both companies are solely responsible for the transmission and distribution of electricity to their consumers on the respective islands. The generating stations and the sub-stations use a relatively small number of large transformers on the ground. The last stage in the distribution system SKELEC and NEVLEC uses involve approximately 800 smaller transformers located on the utility poles of the supply lines.

The power supply system produces significant quantities of used cooling oils removed from the transformers, which undergo a recycling process.

In the 1970s, transformers used in electrical power generation, transmission and distribution were supplied with cooling oils containing PCBs as additives to improve performance. Use of these compounds in new transformers has been discontinued and substituted with mineral oil. However, there are several transformers still in use in Saint Kitts and Nevis that contain cooling oils which may be contaminated with these chemicals, particularly the smaller transformers on poles in the distribution system.

The Rapid Assessment and Inventory of Stored PCB Oil and PCB Contaminated Equipment for Disposal, 2016 identified forty-five (45) defunct transformers located at the SKELEC and the NEVLEC facilities that potentially contained cooling oils with PCBs. The records provided by the Saint Kitts and Nevis Bureau of Standards (SKNBS) 2016 and the transformer inventory, which includes the location, type and quantity of transformers or stored oils potentially contaminated with PCBs as of June 2016, are presented in Table 2-3 (Rapid Assessment and Inventory of Stored PCB Oil and PCB Contaminated Equipment for Disposal, 2016).

Table 2-3: Location of potentially PCB contaminated equipment and stored oils (June 2016).

Type of Equipment	Quantity		Location of Equipment
	Saint Kitts	Nevis	
Transformer	83	21	1. SKELEC, Needsmust, Basseterre, Saint Kitts.
Accumulated oil	-	(10,000 gallons) 30 – 55 gallons barrels	2. NEVLEC, Prospect Power Station, Prospect, Nevis 3. Delta Petroleum (Nevis) Ltd, Low Ground, Long Point, Nevis
Switches	18	-	

(Source: SKNBS)

Following the assessment there were several recommendations made based on the test results obtained from the in-country sampling. These include:

- a. No oil or equipment was tagged for disposal under the FAO/GEF #5407 project since all samples recorded PCBs concentrations of lower than 50 ppm (the Stockholm Convention threshold for PCB contamination).
- b. Oil from transformers and other pieces of equipment that have not been tested for PCBs, should not be blended with the oil already demonstrated to be PCB-free.

Policy and regulatory framework

Currently, there is no legislation or regulations specifically designed to address PCB management in Saint Kitts and Nevis.

Monitoring data

GEF is involved in several funded projects in the Caribbean region with regards to the management of POPs chemicals. However, based on the PCB findings for Saint Kitts and Nevis, there is no need for disposal.

Potential health impacts

PCBs are very persistent and are widely distributed in the environment. Food is the major exposure pathway of humans but in PCB containing buildings (sealants, paints or small capacitors) contaminated of indoor air may also be a major source of human exposure to PCBs.

No known investigations on the result of industrial PCBs have been conducted in Saint Kitts and Nevis. However, studies have indicated that PCBs can cause such health problems as liver damage, skin irritation, cancer, and reproductive system damage. PCBs have been listed in category 1 of cancer causing chemicals by the International Agency of Research on Cancer (IARC) in 2016.

2.3.3 Assessment of POP Polybrominated diphenyl ethers (POP-PBDEs) (Annex A, Part IV and Part V) and Hexabromobiphenyl (HBB) (Annex A, Part I)

In 2009, the SC on POPs was amended to encompass particular brominated flame retardants (BFRs) in Annex A: HBB and two (2) PBDEs (Secretariat of the SC, 2015a). Hexabromobiphenyl (HBB) was produced for a short stint from 1970 to 1976, during which approximately 5 400 t were produced. Given that the production of HBB around the world ceased in the 1970s (Secretariat of the SC, 2015a). The products containing HBB have largely entered end of life decades ago. Thus it is recognised that the scope of a HBB assessment for many countries may be limited. For that reason, HBB was not considered as a relevant POP in Saint Kitts and Nevis.

PBDEs are a group of industrial aromatic organobromine chemicals that have been in use since the 1970s as additive flame retardants in a wide range of consumer products. POP-PBDEs are listed under Annex A of the SC; prohibiting its production and use, import and export, but allowing the utilisation of articles in accordance with the provisions of Annex A, Parts IV and V (Secretariat of the SC, 2015a).

The main use of Commercial PentaBDEs (c-PentaBDE) was treating polyurethane (PUR) foam. These foams were mainly used in automotive and upholstery applications. Minor uses included textiles, printed circuit boards, insulation foam, cable sheets, conveyer belts, lacquers and possibly drilling oils.

Commercial OctaBDE (c-OctaBDE) was mainly used in acrylonitrile butadiene styrene (ABS) polymers, accounting for about 95% of c-OctaBDE supplied in the EU. The treated ABS was mainly used for housings/casings of electrical and electronic equipment (EEE), particularly for

cathode ray tube (CRT) housings and office equipment such as copying machines and business printers (Secretariat of the SC, 2015a).

POP-PBDEs in EEE/Waste-EEE (WEEE)

Production and use EEE/WEEE

The production and use of POP-PBDE (c-OctaBDE and c-PentaBDE) was stopped in 2004 and since then there has not been any further production. However, c-DecaBDE, which is still in production and use, has recently been listed as POP in May 2017.

Imports new/ second hand EEE

In 2016, there were no CRT televisions imported in Saint Kitts and Nevis. Computer monitors were imported in the quantity of 0.49t, but this figure does not differentiate between CRT monitors and other computer monitors and the quantity that was second-hand versus new, therefore the amount of POP-PBDEs and the polymer fraction imported could not be estimated.

EEE in current use /stored

The inventory into EEE containing POP-PBDEs in current stocks (only) was conducted at the consumer level for households (CARPHA, 2017b). One hundred households were surveyed to determine the quantity of EEE stocks in households in Nevis. On average, about half the number of CRT computer monitors (0.52 units per household) was in use compared to liquid crystal display (LCD) monitors (0.96 units per household) in the sample surveyed. The stored CRTs in households (0.2 units per household) were more than twice the number of LCD monitors in storage (0.09 units per household). A similar trend was noted for televisions, as more LCD TVs than CRT TVs were used, but almost three (3) times the number of old CRT TVs was stored in homes than LCD TVs.

While in Saint Kitts out of the two hundred (200) households surveyed there were only ten (10) CRT TVs (0.05 units per household) and no CRT computer monitors. In contrast, there were 1000 CRT computer monitors in use/stored in government/government agencies (with less than 10 in current use) and none in the private sector companies surveyed. In Saint Kitts, the public sector started to phase out CRT monitors in 2009 whereas the private companies stopped the imports a year later (2010). CRT TVs were not found in the public sector.

The total weight of monitors in household EEE (CRT computer monitors and TVs and LCDs) in the Nevis samples surveyed was 424.36 t and that of CRT computer monitors and TVs was 268.3 t. The total amount of impacted polymer in household CRT computer monitors and TVs (Nevis) was 80.44 t and the total estimated amount of c-OctaBDE was 94.98 kg. The total amount of impacted polymer in household CRT TVs (Saint Kitts) was 5.83 t and the total estimated amount of c-OctaBDE was 5.07 kg. Hence the total impacted polymer and the estimated amount of c-OctaBDE for Saint Kitts and Nevis is 80.44 t and 95 kg respectively (CARPHA, 2017b).

POP-PBDE containing WEEE plastic in end of life

The amount of impacted CRT computer monitors and TVs entering into the waste stream was 24.90 t. The estimated e-waste generated from CRT computer monitors was 5t and WEEE generated from CRT TVs was 20 t. The estimated total amount of POP-PBDEs (c- OctaBDE) in EEE entering the waste stream was 9 kg. Total impacted polymer fraction entering the waste stream was 7.5 t (CARPHA, 2017b).

In Saint Kitts, there is no separation of WEEE materials from the general waste at the Conaree Landfill. The Saint Kitts Solid Waste Management Corporation has indicated that they will be separating WEEE and placing it in a dedicated location at the landfill in the short to medium term. At the end of the life cycle all WEEE materials are taken to the Low Ground Landfill (Nevis) where piles are separated from other waste materials. Some of these materials are compressed and stocked into piles (CARPHA, 2017b).

Content of POP-PBDEs and total amount of impacted material

The POP-PBDEs (heptaBDE and hexaBDE) in the c-OctaBDE was calculated according to the homologue content of c-OctaBDE; the heptaBDE homologue was estimated as 43% and the hexaBDE as 11% (UNEP, 2015) (Table 2-4). The total inventoried homologue for hexaBDE was 11.44 kg and that of heptaBDE was 44.7 kg. The grand total for the homologues hexaBDE, heptaBDE was 56.15 kg (CARPHA, 2017b).

Table 2-4: Estimated distribution of the homologues c-OctaBDE for household stocks and waste stream in Saint Kitts and Nevis for the inventory year 2016.

Homologues	Distribution homologues c-OctaBDE	POP-PBDEs in import for inventory year 2016	POP-PBDEs in use for inventory year 2016	POP-PBDEs entering the waste stream 2016	POP-PBDEs in recycled polymers for inventory year 2016	Total (kg)
Inventoried c-OctaBDE	NA	ND	94.98 kg	8.99 kg	NA	NA
HexaBDE	11%	ND	10.45	0.99	ND	11.44
HeptaBDE	43%	ND	40.84	3.87	ND	44.04
Total						55.31

NA= Not Applicable

ND = not determined

(Source: (CARPHA, 2017b).

POP-PBDEs in Transport Sector

POP-PBDEs in vehicles used and in stock produced before 2005

In 2016, approximately 8,668 vehicles were in use in Saint Kitts and Nevis. There are no regulations on the import of used vehicles of a particular age. However, according to the Environmental Levy (Used Motor Vehicles) (Amendment of Schedule) Order, 2005, the following levy is imposed on used motor vehicle imported:

- a. more than two (2) years but less than four (4) years after date of manufacture, \$3,500; and
- b. four (4) years or more after the date of manufacture, \$5,000.

In light of these regulations it can be assumed that presently the percentage of used vehicles produced before 2005 may be high. The total estimated amount of POP-PBDEs in PUR foam of vehicles in current use for the inventory year (2016) could not be estimated due to the lack of data on the import of vehicle by country (CARPHA, 2017b).

Amount of POP-PBDEs and total amount of impacted material

Estimations for the amount of impacted vehicles could not be achieved because of the lack of complete records from the Customs and Excise Department.

Management and inventory of POP-PBDE containing PUR foam and other plastic/polymers in current stock entering end of life

The total number of vehicles (cars, trucks and buses) registered in Nevis for 2016 was 5,849 (cars-5,129, trucks-653, buses-67). While the vehicles registered in Saint Kitts for 2016 only was 2,819⁵.

The average polymers (plastic, foams, synthetics) in cars are approximately 15%⁶. Considering an average weight of a car (1.333 t)⁶, this would mean that approximately 200 kg are polymers. In the current registered cars, a total of 1026 t (5,129 x 200 kg) of polymers (plastic, foam and synthetics like textiles) were present in cars in current use in 2016. Assuming that approximately 200 kg polymers were present in a truck and 400 kg polymers were present in a bus (minibus), then the truck and mini-bus fleet in 2016 contained approximately 131 t (653 x 200 kg) and 27 t (67 x 400 kg) of polymers respectively. Therefore approximately 1,184 t of polymers are included in the transport fleet of Nevis for 2016 (CARPHA, 2017b).

In addition to PentaBDE some of the polymers and textiles contain DecaBDE and HBCD, which were recently listed as POPs (Kajiwara et al., 2014). In conclusion, the 1,184 t of polymers in vehicles need to be managed in an environmentally sound manner including the present POPs and other pollutants (CARPHA, 2017b).

⁵ Information on the distribution was not available for Saint Kitts.

⁶ Rouilloux G, Znojek B. Plastics. The Future for Automakers and Chemical Companies. AT Kearney Report. Please note: The polymer content and the weight of vehicles changes over time with increasing contribution of polymers.

Recycling

In Saint Kitts, vehicles are stored in a separate area of the Conaree Landfill. The public is allowed to remove usable parts (if so desired). Vehicles are then crushed and stored for eventual removal/shipping out of the island.

No materials are removed from the vehicles at the Low Ground Landfill (Nevis). Persons are asked to remove all tires and fluids (oil etc.) within the vehicles. These vehicles are then placed in piles at the Solid Waste Management facility until they are removed/shipped out of the island for scrap metal usage (CARPHA, 2017b).

Policy and regulatory framework

There is no legislation or policy specifically targeted at the management of POP-PBDEs in Saint Kitts and Nevis.

Monitoring data

Presently there is no monitoring of POP-PBDEs and its effects in Saint Kitts and Nevis.

Potential impacts

Exposure to PBDEs occurs along the life cycle of the products and materials. In particular c-Penta treated polyurethane foam in vehicles or furniture or recycled materials can result in high exposure. The exposure to PBDEs from WEEE plastic is lower with e.g. lower levels of PBDE in recyclers from BAT e-waste recycling facilities. Of great concern is the open burning of PBDE containing waste. In particular, the smouldering of e-waste and cables can result in contaminated sites.

Potential health impacts

A significant number of studies have confirmed the almost ubiquitous presence of PBDEs in the environment. PBDEs have been detected in outdoor air, sediments, sludge, and soil; in indoor air and house dust; in several food commodities; and in birds, marine species, fish and terrestrial animals. PBDEs have also been detected in human adipose tissue, serum and breast milk. Levels of PBDEs have increased significantly. PBDEs can cross the placenta, and similar concentrations have been found in maternal and foetal blood. Levels of PBDEs ranging from 4 - 98.5 ng/g lipid have also been found in foetal liver. PBDE exposure mainly occurs from the diet and the indoor environment, though some occupational exposure has also been documented. Among foods, fish, meats, and dairy products contain the highest concentrations of PBDEs (Costa, 2009).

The toxicological endpoints of concern for environmental levels of PBDEs are likely to be thyroid hormone disruption, neurodevelopmental deficits and cancer. Unfortunately, the available toxicological evidence for these endpoints is surprisingly limited, given their widespread use, bioaccumulative potential, and structural similarity to thyroid hormones. Available evidence

suggests that the PBDE congeners are likely to bioaccumulate in human tissues and other biota and have the propensity to disrupt thyroid hormones, cause neurobehavioral deficits and possibly cause cancer in laboratory animals.

2.3.4 Assessment of Hexabromocyclododecane (HBCD) (Annex A, Part I and VII)

HBCD is a lipophilic brominated flame retardant. It is used as a flame retardant additive to reduce the flammability of textiles in buildings vehicles and EEE (Secretariat of the SC, 2015b).

The use of HBCD in textiles and in EEE is small when compared to its use in expanded and extruded polystyrene (EPS/XPS) foam where more than 90% of HBCD have been used. EPS/XPS foam is used in insulation boards, which are used in building construction, transport vehicles and road and railway embankments. Another significant application of HBCD is in back coating of textiles. Treated textiles are mainly used in upholstery in residential and commercial furniture drapery and wall coverings and automobile interior textiles. HBCD was also used in high-impact polystyrene (HIPS) in EEE (Secretariat of the SC, 2015b). EPS/XPS containing HBCD have long service lives. Thus, it is possible that the stock of HBCD that ends up in the environment is increasing. Proper planning is needed to adequately manage the disposal of waste containing HBCD.

Production and use

HBCD is not produced in Saint Kitts and Nevis. However, it may still be in use in products containing HBCD. An inventory of HBCD containing products was not possible since there is no information available on the status of HBCD in products imported into the country and it is difficult to identify products that contain the chemical. Additionally, potential importers and users of HBCD containing products have no knowledge of whether or not items they import and distribute contain HBCD (CARPHA 2017b).

HBCD in polystyrene (EPS and XPS) in current use and stock

HBCD in EPS/XPS in construction (major use)

An inventory of the current use and stock of HBCD in EPS and XPS construction insulation material was not possible; however, it is expected that small quantities are used given that residential buildings are not commonly insulated. Government buildings may be insulated; however, it was not possible to determine if the insulating material contains HBCD.

HBCD in EPS/XPS in packaging (minor)

Most packaging is considered not to contain HBCD. However, an inventory of HBCD (EPS) into products (disposable drinking cups, pizza boxes and wrapping paper, etc.) cannot be established in this study since it is not known what share of these materials are treated with HBCD. In such cases product testing would be required to determine if HBCD is present.

HBCD in textiles and other minor uses

An inventory of HBCD (EPS) in textiles, furniture, children's sleepwear, nursing pillows could not be established in this study since it is not known what share of these materials are treated with HBCD.

Policy and regulatory framework

There is no legislation or policy specifically targeted at the management of HBCD.

Monitoring data

There have not been many studies on POP-PBDEs/HBCD and its effects in the country.

Potential health impacts

HBCD is toxic to aquatic and soil organisms. New scientific findings have contributed significantly to our understanding of chronic, long-term effects of the toxicity and hazards of HBCD exposure both to wildlife and humans. The toxicological endpoints of concern for HBCD in humans are thyroid hormone disruption, neurodevelopmental deficits and cancer.

2.3.5 Assessment of Polychlorinated naphthalene (PCNs) (Annex A, part I)

PCNs are products that are made by chlorination of naphthalene. PCNs can enter the environment through usage or accidental leakage during storage, fire, or transport.

Production and use

PCNs were mainly used between 1920 and 1960, but remained high volume chemicals until the 1970s (AMAP, 2004; Jakobsson & Asplund, 2000; Secretariat of the SC, 2017b). PCNs were used in the same applications as PCBs, however with different focus of products.

PCNs were commonly used in open applications like sealants, paints and plastic additives; however, short-chain chlorinated paraffins (SCCP) are currently used in these applications.

The total production and use of PCNs (150,000 t) is estimated at approximately 10% of the production and use of PCBs (approximately 1.35 million t) (Secretariat of the SC, 2017b). Given the considerably lower historic and earlier uses, PCNs have already entered end of life to a large extent. There is no indication that PCNs are intentionally used in products or articles today (Secretariat of the SC, 2017b).

PCNs usage in Saint Kitts and Nevis was and should be addressed within PCB management refer to the subchapter 2.3.2.

Policy and regulatory framework

In the absence of a regulatory framework specifically for the control and management of hazardous and toxic substances, there is no legislation or policy in Saint Kitts and Nevis governing the import and use of PCNs.

Potential health impacts

PCNs dissolve readily in oils and in the fatty tissues of fish, birds and mammals and are, thus, accumulated by living organisms at all levels of the food chain. Human exposure to these contaminants is mainly through the consumption of food, particularly fish caught in contaminated waters, and to a much lesser extent through direct contact with contaminated water. Chemical induced toxicities include effects on the immune system, which may lead to diminish resistance to infectious agents.

2.3.6 Assessment with respect to Annex B chemicals Dichlorodiphenyltrichloroethane (DDT)

DDT was used widely during World War II as an insecticide to protect soldiers from contracting malaria, typhoid and other vector-transmitted diseases. Its use as an insecticide continued after the War, especially on cotton plantations. In countries where malaria is an epidemic, DDT is still used. DDT is chemically stable and persistent (as much as 50% can remain in the soil 10 - 15 years after application) and its residues have been detected as far as the Arctic. Under Annex B in the SC, DDT can be used for disease control.

Production, import, export and use

DDT has been banned for quite some time, and is not present on the list of approved chemicals that are permitted to enter Saint Kitts and Nevis (CARPHA, 2017a).

Policy and regulatory framework

The Pesticides and Toxic Chemicals Control Board regulates all aspects of pesticide and toxic chemicals, including DDT entering and used in Saint Kitts and Nevis.

Monitoring data

CEHP conducted a study of human exposure to POPs and other toxicants in Saint Kitts and Nevis. The results of the study showed that mothers from Saint Kitts and Nevis were exposed to very low concentrations of POPs. Dichlorodiphenyldichloroethylene (DDE), the major metabolite of DDT, was detected in 39% of women while DDT was detected in 11% of the sample. The low concentrations of DDT detected indicated that exposure was recent. Additionally, low concentrations of organophosphate pesticides were found in the urine of mothers (Saint Kitts and Nevis NIP, 2014). A summary of the findings of a human POP exposure study and other toxicants in Saint Kitts and Nevis is presented in subchapter 2.3.1.

Potential health impacts

Studies suggest that DDT may be related to various diseases, including cancers, as well as having neurological, mental and reproductive effects. Children may be more susceptible to the effects of pesticides due to increased exposure via food and breast milk, underdeveloped detoxification pathways, and longer life expectancy in which to develop diseases with long latency periods (Cohen, 2007).

Seafood consumption is an important route of human exposure to organic contaminants. Residual levels of organochlorine pesticides (OCPs), including DDTs were determined in a wide variety of seafood products collected from eleven (11) coastal cities in southern China in June and October 2005. The results indicated that OCPs were predominated by DDTs. Risk assessment against various standards clearly showed that seafood products were highly contaminated by DDTs and may pose health threats to consumers all over the world. DDT has also been associated with eggshell thinning in birds.

2.3.7 Assessment of Perfluorooctane sulfonic acid (PFOS), its salts and PFOSE (Annex B, Part III chemicals)

PFOS is a fully fluorinated organic substance whose common use is as a salt, or as part of larger polymers. PFOS-related substances are often derived from PFOS, as it is intermediate for their synthesis. PFOS is therefore restricted along with PFOS-related substances, which can degrade to PFOS (precursors). Other per- and polyfluoroalkyl substances (PFAS) are not listed in the SC but perfluorooctanoic acid (PFOA) was evaluated by the POP Review Committee as POP and PFAS have been listed as emerging policy topic under the Strategic Approach to International Chemical Management (SAICM).

PFOS is the best surface-active compound with extremely low surface tensions. Also, other PFAS containing multiple fluorine atoms can be polyfluorinated or perfluorinated and also have surfactant properties. They were used widely in textile impregnation because of their ability to effectively lower the surface tension of water, as compared to hydrocarbon surfactants. PFOS and PFAS or degradation products are chemically stable (both in industrial applications and in the environment) due to their strong carbon-fluorine bonds.

Under the SC, the acceptable uses for PFOS include medical devices, metal plating, pesticide manufacturing (insecticides for leaf-cutting ants), and electronic industries and firefighting foam (since there were no alternatives in 2009) (Secretariat of the SC, 2015c). However, alternatives are available for these applications (POPRC, 2016). Specific exemptions for PFOS can be applied for chemically driven oil production, insecticides (for control of ants, termites), metal plating and electronic industries. However, it must be noted that alternatives for PFOS should be phased into these applications wherever possible.

Production, import and use

Firefighting foam use (Current/historic use and stock)

PFOS, its salts and related substances are not manufactured in Saint Kitts and Nevis. The major current use of PFOS and PFOS-related substances in Saint Kitts and Nevis was in firefighting foams used for hydrocarbon fires. Aqueous film-forming foams (AFFF) comprised the main use of PFOS/PFAS substances. Saint Kitts and Nevis Fire and Rescue Services imports its PFOS/PFAS containing foam from National Foams in the USA.

Stock of PFOS containing foams

The only national body that uses these PFOS/PFOS-containing foams is the Saint Kitts and Nevis Fire and Rescue Services. The Government of Saint Kitts and Nevis maintains five (5) fire stations between the twin-island state: RLB International Airport Fire Station, Sandy Point Fire Station and Tabernacle Fire Station in Saint Kitts, and Newcastle Fire Station (located at the Vance Amory International Airport in Nevis) and Charlestown Fire Station in Nevis. Of these locations, AFFF are stocked at RLB International Airport Fire Station and the Newcastle Fire Station. In 2016, the quantity of PFOS-based foam stocked was 4471.87 L in vehicles and 662.45 L in reserves (Table 2-5) (CARPHA, 2017 c). It should be noted that according to the safety data sheet – NMS#320 Aer-O-Lite TM C6 6% AFFF, - the concentration of fluoroalkyl surfactants is 1 – 5%. Consequently, it unknown whether this firefighting foam contains only PFOS and or other PFAS chemicals. The estimated amount of PFOS/PFAS will be an upper estimation of the content of PFOS/PFAS. Therefore, assessment of the firefighting foam is needed.

The amount of PFOS containing mobile fire extinguishers in private institutions has not been assessed in this inventory.

Table 2-5: Stockpiles of PFOS/PFOS related firefighting foams at fire service stations in Saint Kitts and Nevis in 2016.

User Category	Type of PFOS foam used	Quantity of PFOS related foam stock (2016) (L)	
		Vehicles	Reserve
Newcastle Fire Station (Nevis)	*Aer-O-Lite AFFF 6% (NFC320)	NA	NA
	AFFF 6%	3,406.87	662.45
Charlestown Fire Station (Nevis)	No AFFF used	-	-
Robert L Bradshaw International Airport Fire Station (Saint Kitts)	*Aer-O-Lite AFFF 6% (NFC320)	1065	0
Sandy Point Fire Station (Saint Kitts)	AFFF 6%	NA	NA
Tabernacle Fire Station (Saint Kitts)	AFFF 6%	0	0
Sub-Total		4,471.87	662.45
Grand Total PFOS-based foam stocks at the fire services			5,134.32

(Source: CARPHA, 2017c)

*According to the MSDS the concentration of fluoroalkyl surfactants is 1 – 5%; NA- not available

Estimation of PFOS in stock (2016)

Saint Kitts and Nevis's total stockpile of PFOS foam in 2016 was estimated at 5134.32 L (5288.35 kg) (Table 2-5). The largest stockpile of foam was at the Newcastle Fire Station. Fire trucks from Newcastle Fire Station serve Newcastle and Charlestown (CARPHA, 2017c).

The total estimated content of PFOS in Saint Kitts and Nevis, based on the quantity of PFOS/PFOS-containing firefighting foams in stock in 2016, ranged from 26.44 to 79.33 kg. The Newcastle Fire Station accounted for almost 80% of the content, and RLB International Airport made up the remaining 20% (Table 2-5).

Current and historical use of PFOS containing foams

PFOS firefighting foams have been used in Saint Kitts and Nevis for some time. When the PFOS foams were introduced on the islands, members of the fire service were instructed and trained in proper use. However, information on the site and quantity of foam used during these training sessions was unavailable except for Runway 28, located on the eastern side of Newcastle Fire Station. In 2016, approximately 150 gallons (567.81 L) of PFOS-related foam was used during testing of the fire vehicles, equipment and operations (CARPHA, 2017c). There have been no major hydrocarbon fires in the history of Saint Kitts and Nevis, which would have required the use of PFOS foams.

Synthetic carpets, textiles and leather and related stockpiles

Synthetic carpet (tufted carpets) was a major use area of PFOS. Synthetic carpets are considered a PFOS stockpile today. The main use was before 2002 (at the time of high PFOS production volumes). For the synthetic carpets mainly the nylon and polyacryl fibres were treated with a PFOS polymer. Final PFOS concentration is approximately 0.3% (GUT, 2011). Since synthetic carpets has a long service life of approximately 20 years and possibly longer, synthetic carpets from 2002 and earlier are still in use. A quantity of 10,544.84 kg of rugs/carpets was imported into Saint Kitts and Nevis in 2016. The composition of the rugs/carpets, whether they were made of natural or synthetic fibres or were impregnated textiles, was unknown. Some PFOS-containing textiles may have entered the country, but this amount in current use may be almost negligible since the height of production of PFOS-containing carpets coincided with the height of PFOS production, before 2002. The amount of PFOS containing carpets could not be estimated within the inventory frame. A part and possibly the greater part of PFOS treated carpets produced from 1970s to 2002 have probably already been disposed of at the Conaree Landfill in Saint Kitts and the Low Ground Landfill in Nevis (CARPHA 2017c).

PFOS has been used in treated textiles like outdoor jackets, awnings/sunblinds, stain repellent furniture and umbrellas. PFOS treated paper was used in fast food boxes, pizza boxes, fast food wrapping, backing paper, muffin cups, and popcorn packages, among other areas. PFOS treated textiles and paper has shorter service life and the PFOS treated textiles and papers mainly produced

before 2002 have largely entered end of life and are in landfills and dumpsites with related releases. Alternatives to PFOS, including other PFAS non-fluorinated alternatives have been in use for a few years. It is likely that PFOS and other treated paper and textiles have been and are imported into Saint Kitts and Nevis considering the high share of treated food contact paper (Schaidler et al., 2017). The islands have a Kentucky Fried Chicken, Burger King, Subway and Domino's Pizza branch and these popular international fast-food companies might use packaging that contains PFAS since a large share of such food wrapping contain PFAS (Schaidler et al., 2017) and possibly might have contained PFOS in the past.

Policy and regulatory framework

There is no legislation that covers specifically PFOS and related chemicals in Saint Kitts and Nevis. However as stated in subchapter 2.2.4 there is legislation that covers various aspects of chemicals management in the country.

Monitoring data

There is no data relating to PFOS monitoring in Saint Kitts and Nevis.

Potential health impacts

PFOS like other POPs can have an adverse effect on human health, biodiversity, and ecosystems. They can lead to serious health effects including certain cancers, birth defects, dysfunctional immune and reproductive systems, greater susceptibility to disease, and damages to the central and peripheral nervous systems (Secretariat of the SC, 2015c; UNEP, 2010).

2.3.8 Assessment of releases of unintentional produced chemicals (Annex C chemicals)

Four (4) of the original twelve POPs listed in the SC were unintentionally produced POPs (UPOPs). They are polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), hexachlorobenzene (HCBs) and polychlorinated biphenyls (PCBs) (the main amount of PCBs is intentionally created, but a minor amount is also produced unintentionally). Three (3) UPOPs have been recently added to the list: pentachlorobenzene (PeBz) added in 2009; polychlorinated naptalenes (PCNs) added in 2015 and, hexachlorobutadiene (HCBD) added in 2017.

UPOPs are commonly formed as by-products of various processes (chemical and thermal). They are produced unintentionally due to incomplete combustion, the production of organochlorine chemicals (pesticides, solvents, PVC, pigments), processes where elemental chlorine is present and thermal processes in the presence of all forms of chlorine (UNEP, 2013). During thermal processes the listed unintentional POPs are formed altogether within a certain concentration range between the different unintentionally POPs group. Therefore, for most of these processes and in particular thermal processes relevant for the country, it is sufficient to inventorise and reduce PCDDs/PCDFs and at the same time other unintentional POPs

are reduced in a similar manner (UNEP, 2013).

Production and use

Total emission of PCDDs/PCDFs for Saint Kitts and Nevis in 2016 was estimated at 0.062 g TEQ/a (Table 2-6). Emission as residue was the highest (0.028 g TEQ/a) and also the major contributor to the overall PCDDs/PCDFs emissions. The second highest emission of PCDDs/PCDFs was to air, (0.021 g TEQ/a) followed by emission from land and water (0.021 g TEQ/a and 3.0×10^{-4} g TEQ/a respectively).

The major contributor of PCDD/Fs to residue was source group 9, disposal (0.028 g TEQ/a), via category b, mixed domestic and industrial inputs. Minor emission of residue from the production of mineral products (4.3×10^{-4} g TEQ/a) and miscellaneous- crematoria, was 3×10^{-4} g TEQ/a. Source groups 6 (open burning processes) was the major contributors to the air emission (0.017 g TEQ/a) followed by group 3 (heat and power generation) where the emission was 0.003 g TEQ/a. Minor PCDDs/PCDFs emission to air also came from transportation and production of mineral products, 9.7×10^{-4} g TEQ/a and 5.0×10^{-5} g TEQ/a, respectively. In the latter source group, PCDDs/PCDFs air emission was low due to air cleaning technology (wet scrubbers) used when mixing asphalt. The only other emissions of PCDDs/PCDFs to the environment were through land from open burning processes (0.012 g TEQ/a) (CARPHA, 2017d).

Table 2-6: Estimated emissions of PCDD/Fs and other UPOPs for inventory in 2016.

Group	Source groups	Annual releases (g TEQ/a)				
		Air	Water	Land	Product	Residue
1	Waste Incineration	0.000	0.000	0.000	0.000	0.000
2	Ferrous and Non-Ferrous Metal Production	0.000	0.000	0.000	0.000	0.000
3	Heat and Power Generation	0.003	0.000	0.000	0.000	0.000
4	Production of Mineral Products	5×10^{-5}	0.000	0.000	0.000	4.3×10^{-4}
5	Transportation	9.7×10^{-4}	0.000	0.000	0.000	0.000
6	Open Burning Processes Production of Chemicals and Consumer	0.017	0.000	0.012	0.000	0.000
7	Goods	0.000	0.000	0.000	0.000	0.000
8	Miscellaneous	0.000	0.000	0.000	0.000	2.8×10^{-5}
9	Disposal	0.000	2.9×10^{-4}	0.000	0.000	0.028
10	Identification of Potential Hot-Spots	0.000	0.000	0.000	0.000	0.000
1-10	Total	0.021	2.9×10^{-4}	0.012	0.000	0.028
	Grand Total	0.062				

(Source: CARPHA, 2017d)

Details of main Source Groups and Categories are stated below based on the 2016 inventory in Saint Kitts and Nevis (CARPHA, 2017d).

Source group 1 – Waste Incineration

Incineration is a high-temperature thermal treatment in which substances (usually organic substances) are burnt in a contained environment or system. The result is the conversion of the waste to a mixture of ashes, flue gas and more heat. Many use incineration because it provides the benefit of dramatically decreasing the mass of the waste, leaving behind ashes that are much more easily disposed of. If improperly executed, incineration can lead to the release of harmful substances, including carbon monoxide and dioxins. Of the seven (7) source categories under this source group 1, only *source category 1(c) Medical waste incineration* was applicable to Saint Kitts and Nevis and is discussed in this subchapter. In Nevis, municipal and industrial waste, sewage sludge, waste wood and biomass and animal carcasses are routed to the Low Ground Landfill. There is no incinerator at this site but only green waste, which is subject to open burning at the facility. The residue is disposed of at the landfill. In Saint Kitts, both the Ross University and the Joseph N France (JNF) General Hospital house incinerators.

Source group 4 – Production and Mineral Products

The source categories relevant to Saint Kitts and Nevis under this source group was *4(f) Asphalt mixing*. No mineral production occurs in Nevis. However, there is an asphalt plant in Nevis, which is contracted to surface roads. The plant is diesel powered with a semi continuous operation. While the annual production of the Asphalt plant is 7,220 t/a, its capacity is 292,000 t/a. The furnace process heater and turbine internal gas temperature operation 155⁰C. The system has a wet scrubber and heat recovery. The operating gas temperature is 180⁰C, with an exit temperature from the Abatement Pollution Control System (APCS) of 175 ⁰C. The flux of exit gas is 150 - 180 ⁰C. The sludge generated is transported to the landfill, while the wastewater is recycled and reused. Thus, the PCCD/PCDF air emission was 5.1 x 10⁻⁴ g TEQ/a and residue emission was 4.3 x 10⁻⁴ g TEQ/a.

Source group 5 - Transport

Most vehicles today with internal combustion engines that use gasoline are 4-stroke. Four-stroke engines are found in cars, buses, trucks, etc.; two-stroke engines are used in mobile machinery, mopeds, scooters, motorcycles, snow/leaf blowers, pressure washers, jet skis and boats, for example. Four-stroke engines operate in a cycle consisting four stages: the intake stroke, the compression stroke, the power stroke and the exhaust stroke. Typically, 4-stroke engines use less fuel, and completely burn the fuel. Two-stroke engines perform all four of these actions, but in one up and down movement. These engines use more fuel than 4-stroke engines and emit exhaust gases with each fresh charge or intake. The source categories relevant to Saint Kitts and Nevis under this source group were *5(a) 4-stroke engine, 5(b) 2-stroke engine and 5(c) Heavy diesel engines*. The total PCCD/PCDF air emission for source group 5 (Transport) is equal to 9.7 x 10⁻⁴ g TEQ/a.

Source group 6 - Open burning

Opening burning of waste is prohibited in Saint Kitts and Nevis. However, there is no formal policy that specifically addresses the burning of waste. There is no burning of waste at the Conaree Landfill (Saint Kitts). Given that Nevis Solid Waste Management Authority's (NSWMA) Low Ground Landfill does not house an incinerator, all green waste, animal carcasses and waste wood and waste biomass are burnt in the open. NSWMA does not grant permission to residents or companies to engage in open burning of wood waste from construction or demolition. Both source categories (6a) *Biomass burning* and (6b) *Waste burning and accidental fires* under source group 6 Open burning processes, were relevant to Saint Kitts and Nevis.

Category 6a Biomass burning:

- Class 1 - Agricultural residue burning in the field, impacted, poor burning conditions - As the NSWMA's Low Ground Landfill does not house an incinerator, open burning of certain organic waste materials is practiced. In 2016, NSWMA burnt 6 246 t of biomass. The PCDDs/PCDFs for air was 0.003 g TEQ/a, and PCDDs/PCDFs emission for land was 3.1×10^{-4} g TEQ/a.
- Class 5 - Grassland and savannah fires - In Saint Kitts the total number of emergency calls recorded for brush fires in 2016 was 77. Estimates of the area and quantity of material burned were not available.

Category 6b Waste burning and accidental fires:

- Class 2 - Accidental fires houses and factories - The Nevis Charlestown Fire Station reported that 10 houses burned during the inventory year. No factory fires were recorded in 2016. In Saint Kitts there were 17 house fires and one (1) commercial fire according to emergency calls. The PCDD/Fs for air and land was 0.011 g TEQ/a.
- Class 3 - Open burning of domestic waste -In Saint Kitts the total number of emergency calls recorded for garbage fires was 23. However, the quantity of domestic waste burned was not available.
- Class 4 - Accidental fires in vehicles - In Saint Kitts the number of emergency calls for vehicular fires was 23, while that for Nevis was 3. The emission of PCDD/PCDF to air was calculated as 0.003 g TEQ/a and that for land was 4.7×10^{-4} g TEQ/a.

Source group 9: Disposal/Landfill

In 2015 the total quantity of waste disposed of at the Conaree Landfill (Saint Kitts) was 42, 567.53 t, while in 2016 the quantity of waste totalled 42,825.68 t. The breakdown of the quantities of the different types of waste disposed of at the Conaree Landfill for 2016 was not available for this inventory. Considering that most of the waste does not have a particularly high PCDD/FS potential, the lower average PCDD/F impact factor ($5 \mu\text{g TEQ/t}$) was used. Therefore for approximately 42,825.68t of total waste disposed at the site, the waste contained approximately 0.21g TEQ/a PCDD/Fs for the inventory year (2016).

In Nevis the total waste disposed at the Low Ground Landfill (Nevis) was 9166.23 t. Similarly, using the lower average PCDD/Fs impact factor, then the waste contained approximately 0.0046 g TEQ/a PCDD/Fs.

Thus, the total estimated emission of PCDD/Fs for the landfills in Saint Kitts and Nevis was 0.21 g TEQ/a.

Policy and regulatory framework

In Saint Kitts and Nevis there is no legislation specifically dealing with management of UPOPs.

Monitoring data

CEHP programme initiated a study in 2007 where levels of prenatal exposures to dioxins (among other POPs) were investigated in 10 Caribbean countries (including Saint Kitts and Nevis).

The results of the study indicated that Saint Kitts and Nevis showed low levels of dioxin exposure (4.5 Dioxin (pg/g lipid) compared to Canada (8.9 Dioxin (pg/g lipid)) (Forde & Dewailly, 2012).

Potential health impacts

PCDDs and PCDFs, because of their lipophilic and persistent nature, are accumulated in various organs of wild animals and the human body in adipose tissue and liver in particular, through the food chain. About 90 – 98% of the average exposure of humans to PCDDs and PCDFs results from dietary intake with food of animal origin being the predominant source. The toxic and biochemical responses induced by PCDDs and PCDFs include carcinogenicity, endocrine, reproductive, neurobehavioral and immune effects (Arisawa, 2005).

2.3.9 Information on the state of knowledge on stockpiles, contaminated sites and wastes, identification, likely numbers, relevant regulations, guidance, remediation measures and data on releases from sites

POPs pesticide stockpiles and wastes

Under the FAO project for the Caribbean Obsolete Pesticides Inventory, “Capacity Building related to Multilateral Environmental Agreements in African, Caribbean and Pacific (ACP) countries – Clean-up of Obsolete Pesticides, Pest Management and Sustainable Pest Management”, a total of thirteen sites/stores of obsolete pesticides were located and 73,058 kg of obsolete pesticides reported (FAO, 2012). Presently there is no stockpile of POPs pesticides in Saint Kitts and Nevis. All of the obsolete pesticides identified in the project were exported as part of the same FAO project (Refer to the Annex).

POPs Pesticide Contaminated Sites

A soil expert was contracted under component 2 of the FAO “Disposal of Obsolete Pesticides

including POPs, Promotion of Alternatives and Strengthening Pesticides Management in the Caribbean” to deal with remediation of soil at contaminated sites. Samples were taken for identification purposes (in July 2017) and a plan/protocol is to be developed to help participating countries deal with contaminated sites, particularly contaminated soil. Sites that were identified as contaminated were designated as not to be used for other purposes until the plan/protocol was completed. Contaminated soil was reported for two (2) sites in Saint Kitts and Nevis, New River Estate (on Nevis) and Saint Kitts Sugar Manufacturing Corporation Agronomy Station (on Saint Kitts). According to the report, the contaminant profile indicated a range of pesticides, including organophosphates, organochlorines and unknown chemicals (FAO, 2016). Currently the sites that have been labelled as contaminated are:

- New River Estate (Nevis)
- Saint Kitts Sugar Manufacturing Corporation - Buckley’s Estate (Saint Kitts)
- Needsmust Site (Saint Kitts) (CARPHA, 2017a)

HBCD and PBDE potentially contaminated sites

The Conaree Landfill (Saint Kitts) and the Low Ground Landfill (Nevis) are considered as potentially contaminated sites since POP-PBDEs are disposed of at these locations. Also, HBCD treated textiles or EPS/XPS might have been disposed in landfills. Additionally, if HBCD is/has been used at construction sites, these areas will be considered as potentially impacted (the release from HBCD in EPS/XPS is relatively small and does not lead to significant contamination at insulated houses however if EPS/XPS foam is not managed then it can be distributed in the environment including marine litter) (CARPHA 2017b).

PFOS potentially contaminated sites

PFOS contaminated sites are generated from poor management (storage, transport, use, disposal) of PFOS/PFOS-based products. The landfill sites in Saint Kitts and Nevis would be potentially contaminated (Conaree Landfill (Saint Kitts) and Low Ground Landfill (Nevis)) since they are the final sites for waste products. Additionally, the areas where firefighting training is conducted using PFOS/PFOS related foams would be potentially contaminated (RLB International Airport, Saint Kitts; Newcastle Fire Station, Nevis) (CARPHA, 2017c).

The related ground water contamination (from landfill leachate or use of firefighting foam) can lead to relevant contamination of drinking water as has been recently demonstrated for the US (Hu et al., 2016). But also soil can be contaminated and lead to further contamination of food (Brambilla et al., 2015). Information on water and soil quality monitoring in these areas was not available at the time of the inventory. There is no known groundwater storage in the area around Runway 28 in Newcastle, so the risk of water contamination at this site is minimal. There are also no residential areas within the immediate vicinity (CARPHA, 2017c).

PCDD/Fs and other UPOPs potentially contaminated sites

A summary of the source categories for contaminated sites and hot spots relevant to Saint Kitts and Nevis are Conaree Landfill (Saint Kitts), Low Ground Landfill (Nevis) and JNF General Hospital (Saint Kitts).

Saint Kitts does not and has not practised thermal cable smouldering. However, in Nevis there has been historic thermal cable smouldering outside the Low Ground Landfill. Consequently, the area outside this facility where the burning occurred could be potentially contaminated with PCDD/Fs and other UPOPs. PCP was not used for wood treatment or agriculture in Saint Kitts and Nevis.

The landfill sites may be potentially PCDD/Fs contaminated sites because products containing PCDD/Fs may be disposed of at such sites. Potentially PCB contaminated sites will also be potential PCDD/Fs contaminated sites (CARPHA, 2017d). Figure 2-3 below shows the POP potentially contaminated sites in Saint Kitts and Nevis.

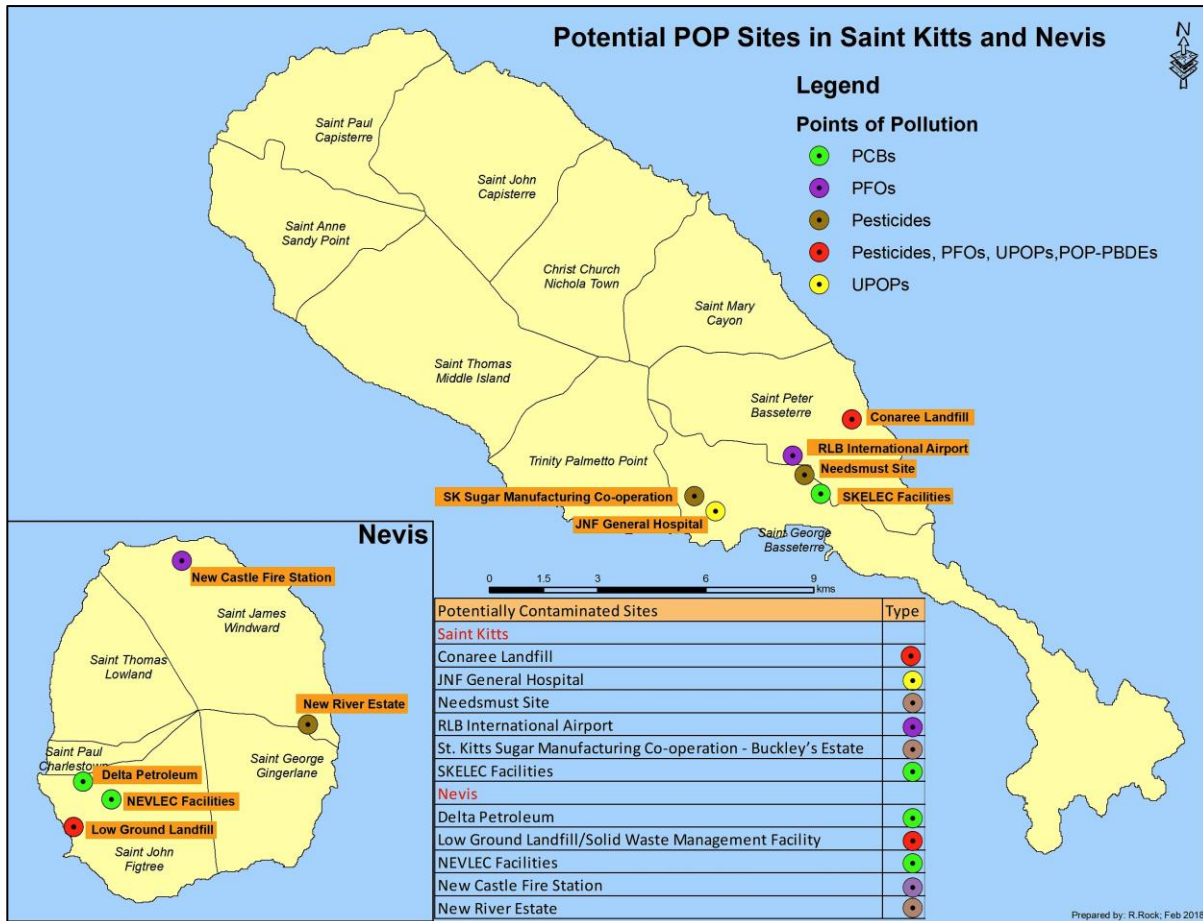


Figure 2-3 Potentially POPs contaminated sites in Saint Kitts & Nevis.

2.3.10 Summary of future production, use and releases of POPs – requirements for exemptions

In Saint Kitts and Nevis no specific exemptions for any of the POPs chemicals listed in the SC are required. Except for PFOS, an assessment of the need of exemptions has not been conducted. Applications for exemptions in Saint Kitts and Nevis would be for firefighting foams. However, PFOS and PFOS-related foams have only been used minimally on the two islands. Consequently, exemptions may not be likely. There should be an assessment if an exemption is needed for stocked firefighting foam containing PFOS considering the risk to ground and surface water.

2.3.11 Existing programmes for monitoring releases and environmental and human health impacts, including findings

The Caribbean EcoHealth Programme's study of human exposure to POPs and other toxicants (mercury, lead and pesticide metabolites) discussed in subchapter 2.3.1 was the only monitoring conducted in Saint Kitts and Nevis thus far. Other POPs monitoring is needed in the country.

2.3.12 Current level of information, awareness and education among target groups; existing systems to communicate such information to the various groups; mechanism for information exchange with other Parties to the Convention

Current level of information, awareness and education among farmers

The PTCCB facilitates training and educational activities, through the Ministry of Agriculture and also private experts, in the areas of pesticides and toxic chemicals (including POPs). Additionally, Rapid Bioassay of Pesticide Residues (RBPR) laboratories on Saint Kitts and on Nevis provide pesticide residue tests of vegetables fruits and crops for local farmers and vendors and also educate them on the proper use of pesticides.

Current level of information, awareness and education among laboratories and industries

Owing to its composition, the PTCCB is able to actively and regularly engage key stakeholders in laboratories and industries regarding POPs and other toxic chemicals.

Current level of information, awareness and education among the general public

The Saint Kitts and Nevis Bureau of Standards (SKNBS) is the key agency in the dissemination of information on POPs and other toxic chemicals. The existing systems used by the SKNBS to communicate such information to the various groups, include:

- An active social media presence: SKNBS website and Facebook page are regularly updated with POPs news and information;
- National workshops/seminars; and

- Annual Ministry of Agriculture Open Day: The SKNBS gives tours of its facilities and informational talks and exhibits on its role and responsibilities (including its work with MEAs like the Stockholm Convention on POPs).

The PTCCB, in collaboration with the Ministry of Agriculture and Environment, also hosts an annual ‘Pesticides Week’ where various activities highlight the importance of sound use, management and disposal of pesticides and other toxic chemicals.

There is no formal system for information exchange at present. Information is exchanged on an informal basis as the need arises.

2.3.13 Mechanism to report under Article 15 on measures taken to implement the provisions of the Convention and for information exchange with other Parties to the Convention

Under Article 15 of the SC the Government of Saint Kitts and Nevis is obligated to report on measures taken to implement the provisions of the Convention and for information exchange with other Parties. The national reporting period for the SC is every four years and its format is in accordance with that established by the COP at its first meeting (decision SC-1/22).

Saint Kitts and Nevis has reported under Article 15. Currently, there is no formal system for information exchange with other Parties of the Convention. However, contacts and information exchange with other Caribbean countries was established during the regional POPs project, which was facilitated through the regional workshops.

2.3.14 Relevant activities of non-governmental stakeholders (including industry, civil society, research community)

Non-governmental stakeholders in Saint Kitts and Nevis have not been involved in any specific activities with regards to POPs chemical management.

2.3.15 Overview of technical infrastructure for POPs assessment, measurement, analysis, alternatives and prevention measures, research and development – linkage to international programmes and projects.

In Saint Kitts and Nevis there is no technical infrastructure in place for POPs assessment, measurement, analysis, alternatives and prevention measures, research and development.

2.3.16 Overview of technical infrastructure for POPs management and destruction

In Saint Kitts and Nevis POPs management and destruction is governed by the Pesticides and Toxic Chemicals Control Act Cap 9.18; particularly PART VIII “General Provisions” of the Act:

Detention of seized articles.

- (1) The inspector or medical examiner may, after seizing any article in accordance with the provisions of this Act, order that the article be kept or stored in the building or place where it is seized or be kept or stored in another place as he or she may deem fit.
- (2) The inspector or medical examiner shall, after seizing any article in accordance with the provisions of this Act, give written notice to the owner of the article or to a person in whose possession the article was at the time of seizure, in which notice he or she shall state the grounds upon which the article was seized and, where appropriate, state what had to be done for the purpose of complying with the provisions of this Act and the regulations made under this Act.

Disposal of seized article.

- (1) Subject to the provisions of subsection (3) of this section, an inspector or medical examiner, as the case may be, shall release any article seized by him or her when the relevant provisions of this Act and the regulations made under this Act have been complied with.
- (2) Subject to the provisions of subsection (3) of this section, where the owner of an article or person in whose possession the article was at the time of the seizure consents, in writing, to the destruction of the article, the article shall be forfeited to the Crown, and shall be disposed of as the Minister may, on the advice of the Board, direct or as may be prescribed by regulations made under this Act.
- (3) Where proceedings are instituted pursuant to the provisions of this Act any article that is seized under this article shall not be released or destroyed before the proceedings are concluded.

There is no destruction capacity on the islands and therefore POPs are either exported or sent to the landfill.

2.3.17 Identification of impacted populations or environments, estimated scale and magnitude of threats to public health and environmental quality and social implications for workers and local communities

The scale and magnitude of threats to public health and environmental quality and social implications for workers and local communities in Saint Kitts and Nevis is low. However, as previously stated a study of human exposure to POPs and other toxicants was done by the CEHP, which showed that mothers from Saint Kitts and Nevis were exposed to very low concentrations of POPs (see subchapter 2.3.1). An assessment of exposure to the newly listed POPs has not been conducted.

2.3.18 Details of any relevant system for the assessment and listing of new chemicals

In the event that any chemical is identified under the Stockholm Convention Secretariat, they would be reported by Saint Kitts and Nevis' National Focal Point, and will be included in the POPs NIP programme at the appropriate time. However, there is no specific system to assess new chemicals used in products or processes.

2.3.19 Details of any relevant system for the assessment and regulation of chemicals already in the market

There is no legislation that deals specifically with the assessment and management of POPs chemicals in Saint Kitts and Nevis. However, there are legislation and regulations that deal with various classes of toxic chemicals, particularly the Pesticides and Toxic Chemicals Control Act Cap 9.18.

The assessment and regulation of chemicals already in the market is addressed under Part IV of the Act "Control of Pesticides and Toxic Chemicals":

Restriction on manufacture, etc. of controlled product

- (3) No person shall, subject to the provisions of subsection (3) of this section,
 - (a) manufacture, import, sell, store in marketable quantities, or transport a controlled product, unless that controlled product is registered in accordance with the provisions of this Act or the regulations made under this Act;
 - (b) import a controlled product into the country without a license issued in that respect in accordance with the provisions of this Act or the regulations made under this Act;
 - (c) store a controlled product in marketable quantities, unless the premises in which the controlled product is stored are licensed in accordance with the provisions of this Act or the regulations made under this Act; or
 - (d) manufacture, import, sell, store in marketable quantities, dispose of, or transport a controlled product, unless the person does so in accordance with the provisions of this Act or the regulations made under this Act.
- (4) For the purposes of this section, and subject to the provisions of subsection (4)(b), a person shall be deemed to store a controlled product in marketable quantities if the quantities found on his or her premises are larger than is reasonably necessary for his or her domestic or farm use.
- (5) The provisions of subsections (1) and (2) shall come into force either

- (a) four months after the coming into force of this Act; or
 - (b) where an application for registration or a license is made within four months after the coming into force of this Act, on the determination of that application.
- (6) For purposes of this Act,
- (a) “controlled product” includes a pesticide, toxic chemical, or any substance or product specified in the Second Schedule to this Act; and
 - (b) chemical weapons that may be classified as controlled products shall not be dealt with under this Act until the protocol for handling chemical weapons under the Chemical Weapons (Prohibition and Control) Act, Cap. 19.19 has been complied with. *[Amended by Act 22/2007]*
- (7) The Minister may, on the recommendation of the Board, by Order, amend the Second Schedule to this Act.

2.4 NIP IMPLEMENTATION STATUS

The status of implementation with the SC requirements is compiled in Table 2-7.

Table 0-7: The Stockholm Convention requirements and NIP implementation and level of compliance of Saint Kitts and Nevis.

Convention Article	Status of implementation	Comments
ARTICLE 3 Measures to reduce or eliminate releases from intentional production and use	For POPs pesticides refer subchapter 2.3.1	There is no production of POP pesticides in Saint Kitts and Nevis. The Pesticides and Toxic Chemicals Control Board is the agency responsible for approval of imports of all pesticides entering the country.
	For PCBs refer to subchapter 2.3.2.	Saint Kitts and Nevis does not produce PCBs and importation has been banned. The principal use of PCBs in Saint Kitts and Nevis was dielectric fluids in electrical transformers by the SKELEC and NEVLEC, which are responsible for the generation, transmission and distribution of electricity in the twin island state. The findings from the 2016 PCB Rapid Assessment suggest that PCB oils are no longer used in Saint Kitts and Nevis.

Convention Article	Status of implementation	Comments
	For DDT refer to subchapter 2.3.6	DDT has been banned for quite some time, and is not present on the list of approved chemicals that are permitted to enter Saint Kitts and Nevis.
ARTICLE 4 Register of exemptions	Saint Kitts and Nevis did not register for any specific exemptions	Not Applicable
ARTICLE 5 Measures to reduce or eliminate releases from unintentional production	Refer to subchapter 2.3.8 where pollution control technology and Best Practical Treatment methods are used	In Saint Kitts, both the Ross University and the JNF General Hospital house incinerators. Opening burning of waste is prohibited in Saint Kitts and Nevis. There is no burning of waste at the Conaree Landfill (Saint Kitts). NSWMA does not grant permission to residents or companies to engage in open burning of wood waste from construction or demolition.
ARTICLE 6 Measures to reduce or eliminate releases from stockpiles and wastes	Refer to subchapter 2.3.9	Under the FAO project for the Caribbean Obsolete Pesticides Inventory, “Capacity Building related to Multilateral Environmental Agreements in African, Caribbean and Pacific (ACP) countries – Clean-up of Obsolete Pesticides, Pest Management and Sustainable Pest Management”, a total of thirteen (13) sites/stores of obsolete pesticides was located and 73,058 kg of obsolete pesticides were identified and exported (FAO, 2012).
ARTICLE 7 Implementation plans	Saint Kitts and Nevis submitted its first NIP on September 30, 2014.	Not Applicable
ARTICLE 8 Listing of chemicals in Annexes A, B and C	Saint Kitts and Nevis has never submitted a proposal on the listing of new chemicals in Annexes A, B and C to the COP.	Not Applicable
ARTICLE 9 Information exchange	Refer to subchapter 2.3.12	Not Applicable

Convention Article	Status of implementation	Comments
ARTICLE 10 Public information, awareness and education	Refer to subchapter 2.3.12	Not Applicable
ARTICLE 11 Research, development and monitoring	Refer to subchapter 2.3.11	The Caribbean EcoHealth Programme's conducted a study of human exposure to POPs and other toxicants in Saint Kitts and Nevis. However, at the country level there is no formal programme of identification and monitoring of POPs chemicals in Saint Kitts and Nevis.
ARTICLE 12 Technical assistance	The organizations that have provided technical assistance to Saint Kitts and Nevis are GEF, UNIDO, BCRC-Caribbean, FAO	Not Applicable
ARTICLE 13 Financial resources and mechanisms	Financial resources are needed for the implementation of the Convention. Saint Kitts and Nevis has initiated payment of pledges and has recently received invoices from the SC Scretariat.	Not Applicable
ARTICLE 15 Reporting	Saint Kitts and Nevis did not submit any report pursuant to Article 15 of the Convention	Not Applicable

Convention Article	Status of implementation	Comments
ARTICLE 16 Effectiveness evaluation	Saint Kitts and Nevis did not participate in the WHO human milk study for the basic POPs (POPs pesticides, PCB, PCDD/F and HCB)	Not Applicable
ARTICLE 17 Non-compliance	In Saint Kitts and Nevis there is no procedure nor institutional mechanisms for determining non-compliance been approved and developed	Not Applicable
ARTICLE 19 Conference of the Parties	Saint Kitts and Nevis attended the Stockholm Convention COPs in 2011, 2013, 2015 and 2017.	Not Applicable
ARTICLE 21 Amendments to the Convention	Saint Kitts and Nevis accepted all the Stockholm Convention amendments.	Not Applicable
ARTICLE 22 Adoption and amendment of annexes	Saint Kitts and Nevis accepted all the Stockholm Convention amendments of the annexes.	Not Applicable
ARTICLE 24 Signature	Saint Kitts and Nevis signed the Stockholm Convention: NA (http://chm.pops.int/Countries/StatusofRatifications/PartiesandSignatoires/tabid/4500/Default.aspx)	Not Applicable

Convention Article	Status of implementation	Comments
ARTICLE 25 Ratification, acceptance, approval or accession	Saint Kitts and Nevis ratified the Stockholm Convention on 21/05/2004.	Not Applicable
ARTICLE 26 Entry into force	The Stockholm Convention entered into force in Saint Kitts and Nevis on 19/8/2004.	Not Applicable

3 STRATEGY AND ACTION PLAN ELEMENTS OF THE NATIONAL IMPLEMENTATION PLAN

The Government of Saint Kitts and Nevis (GSKN) acceded to the Stockholm Convention in 2004 and remains committed to the protection of human health and the environment and also to upholding its international commitments in this regard. Since becoming a Party to the Stockholm Convention, the GSKN has worked assiduously to develop effective strategies for addressing POPs and submitted its first NIP in 2014.

The GSKN is also dedicated to other international conventions, protocols and frameworks such as the Basel Convention on the Control of Transboundary Movement of Hazardous Waste and their Disposal, Rotterdam Convention on the Prior Informed Consent Procedure (PIC) for certain Hazardous Chemicals and Pesticides in International Trade, Montreal Protocol on Substances that Deplete the Ozone Layer and the Strategic Approach to International Chemicals Management (SAICM). Consequently, this NIP seeks to capitalize on any synergies across the various MEAs that Saint Kitts and Nevis is party to.

This chapter has two (2) elements: a formal policy statement and the implementation strategy for the NIP. The implementation strategy sets out specific (updated or new, where relevant) action plans or strategies to achieve Convention obligations and additional priorities/objectives set by the country.

3.1 POLICY STATEMENT

Saint Kitts and Nevis' strong commitment to reducing and eliminating the use of POPs and other toxic chemicals is evident by the Federation becoming a Party to the Stockholm Convention in 2004. The Government of Saint Kitts and Nevis will continue to develop and implement the necessary strategies and practical measures in order to fulfil its obligations under the Convention.

3.2 IMPLEMENTATION STRATEGY

The implementation strategy describes a strategy to support the comprehensive actions to be undertaken in order for Saint Kitts and Nevis to meet its obligations under the Stockholm Convention. These activities are based on the analysis of the country's baseline situation, the country's obligations under the Stockholm Convention, as well as national policies relevant to chemicals management. Respective objectives and activities were identified for institutional and regulatory strengthening measures, environmentally sound management of POPs and public and stakeholder awareness, information and education.

The implementation strategy will be guided by the following:

- Harmonizing the NIP activities in synchronicity with the policies and approaches of the Basel, Rotterdam and Minamata Conventions, SAICM and other relevant frameworks for chemicals management;
- Clearly defining all POPs related roles and responsibilities of government ministries and agencies based on their mandates;
- Ensuring that the general public and all other stakeholders are made aware of the effects of POPs; and
- Ensuring actions also complement the Sustainable Development Goals (SDGs) with specific relevance to POPs and other hazardous chemicals and wastes in particular: (3) Good Health and Well-Being; (6) Clean Water and Sanitation; (11) Sustainable Cities And Communities; (12) Responsible Consumption And Production; (14) Life Below Sea; and (15) Life on Land.



3.3 ACTION PLANS INCLUDING RESPECTIVE ACTIVITIES AND STRATEGIES

3.3.1 Activity: Institutional and regulatory strengthening measures

Table 3-1: Institutional and regulatory strengthening measures.

Priorities	Activities	Performance indicators	Time frame	Responsible Agencies	Budget (XCD)
Cooperation among institutions					
Coordinate activities of the different institutions in the administration and collaboratively monitor chemical and waste management including implementation of the NIP and uses of pesticides	Create a database of key institutions and stakeholders	Database completed and available	Ongoing	SKNBS	No Cost

Assess and set responsibilities of ministries and other authorities for the life cycle management of POPs and other hazardous chemicals (SAICM synergy) and wastes (Basel synergy)	Establish a database of ministries and other authorities	Database established and available	Ongoing	SKNBS	No Cost
Legal and policy framework (legal/regulatory activities for individual POPs are included in the respective action plans)					
Assess and harmonize existing legal/policy framework on POPs and other hazardous chemicals (SAICM synergy)	Review existing legal/policy framework and amend (where necessary) to include POPs and other hazardous chemicals	Cabinet approval of amendments	12 months	SKNBS	No Cost
Inform and capacitate institutions and stakeholders on regulations and on enforcement and compliance of regulations on POPs and other hazardous chemicals (SAICM synergy)	Share information on compliance	Informational material regularly disseminated	Ongoing	SKNBS PTCCB	No Cost

3.3.2 Activity: Measures to reduce or eliminate releases from intentional production and use (Article 3)

Article 3 of the Stockholm Convention requires Parties to take legal and administrative measures to regulate, with the goal of eliminating, the production, use, import and export of the chemicals listed in Annexes A and B of the Convention. Under the Convention, import and export of Annex A and B chemicals are allowed only for specific listed uses and purposes or for environmentally sound disposal. Any import or export of Annex A and B chemicals should be carried out in compliance with the provisions of existing international prior informed consent instruments, such as the Rotterdam Convention.

In addition to exercising regulatory control over import, export, production and use, Parties with regulatory and assessment schemes for new or existing pesticides or industrial chemicals are required to include in these schemes consideration of a number of screening criteria listed in Annex D of the Convention.

The national priorities established in relation to achieving compliance with Article 3 of the Stockholm Convention are to:

- **Take legal measures to prohibit the production, use, import and export of POPs pesticides, with the exception of export for environmentally sound disposal**

There are no facilities for the manufacture of any of the POPs in Saint Kitts and Nevis or use of any of the POPs to manufacture other products; all products are imported. The objective of this action is to reinforce the surveillance system in order to prevent the import, use, storage and wastes from POPs, pesticides and other toxic chemicals in the country. In practice, the current Pesticides and Toxic Chemicals Control Act and Regulations effectively ban import and use of all but some the most recently added POPs chemicals and the activity essentially involves the addition of these to the lists of banned or restricted chemicals under the regulations. It would extend bans on import and use to products containing all Annex A POPs chemicals. This activity is intended to make the required regulatory adjustments to existing Pesticides and Toxic Chemicals Control Regulations to formalize the restricted and acceptable use as allowed under the Convention. In order to meet these goals, the necessary interventions are required. These are outlined in Table 3-2.

- **Take administrative measures to prohibit the import and export of PCBs and PCB-containing equipment**

There is no manufacture of PCBs in Saint Kitts and Nevis but there exists a Pesticides and Toxic Chemicals Control Board (PTCCB) which monitors import and export of PCBs (and other hazardous materials). As it is possible that there remains the potential (although negligible) for importing dielectric fluid and transformers that contain PCBs, security measures should be implemented to require the import of PCB-free transformers and other electrical equipment and dielectric fluids. Moreover, a strategy on hazardous substances management, which proposes a regime for the legal and regulatory control of chemicals, including pesticides, in all aspects of their life cycle, has been developed by the PTCCB. At present, there is currently a regulatory system in place in Saint Kitts and Nevis to control the production, import, export and use of industrial chemicals such as PCBs. The necessary interventions are outlined below in Table 3-2.

Table 3-2: Measures to reduce or eliminate releases from intentional production and use (Article 3).

Priorities	Activities	Performance indicators	Time Frame	Responsible Agencies	Budget (XCD)
Take legal actions to eliminate the production, use, import and export of POPs pesticides, with the allowance of export for environmentally sound disposal	Submit a recommendation to the Chair of the PTCCB and the Ministry of Legal Affairs which requests the addition of Annex A and B chemicals that are not presently banned to the list of banned and severely restricted pesticides.	Chemicals added to the respective list(s)	3 months	SKNBS PTCCB Department of Environment	No Cost
	For each new POPs pesticide added to Annex A or B, submission to the Chair of the PTCCB copies of the proposal, risk profile and risk management profile prepared in respect of that chemical, along with a copy of the decision of the Conference of Parties to include it in the Convention, and a recommendation that the chemical should be formally banned, if such action has not already been taken.	Required documentation submitted to PTCCB	Ongoing	SKNBS	No Cost
	Circulation to members of the Board the relevant information documents about POPs pesticides, followed by action by the PTCCB to ban/severely restrict the chemical(s) in question.	Information documents circulated	Ongoing	PTCCB	No Cost
	Issuance of public notices that the chemicals/pesticides in question have been banned/severely restricted.	Public Notices disseminated	Ongoing		

3.3.3 Activity: Production, import and export, use, stockpile, and waste of Annex A POPs pesticides (Annex A Part I chemicals)

Table 3-3: Production, import and export, use, stockpile, and waste of Annex A POPs pesticides (Annex A Part I Chemicals).

Priorities	Activities	Performance indicators	Time Frame	Responsible Agencies	Budget (XCD)
Develop an adequate legislative framework and policy for POPs pesticides.	Assess and develop/update of the national legislative and regulatory framework on POP pesticides, as well as on counterfeit/illegal trade of pesticides.	Assessment and update completed	24 months	PTCCB Customs and Excise Department SKNBS	240,495
	Develop regulatory frame for GHS and related labelling	GHS regulatory framework developed	24 months	PTCCB SKNBS	
	Legislate mandatory use of PPE for staff working in contaminated /potentially contaminated sites	Relevant law(s) revised by Parliament	36 months	Department of Labour Ministry of Health Attorney General's Chambers SKNBS	
	Enforce rules and regulations for use of POP pesticides/pesticides in general	5-10% reduction in pesticides spills/acid-ents annually	Ongoing	Department of Agriculture Department of Environmental Health	
	Legislate that any users of pesticide should be certified in the proper use of these chemicals.	Relevant law(s) revised by Parliament	36 months	Department of Labour Ministry of Health Attorney General's Chambers	

Priorities	Activities	Performance indicators	Time Frame	Responsible Agencies	Budget (XCD)
				SKNBS	
Sound Life Cycle Management of POPs Pesticides HHPs (Handling, storage, transfer and disposal of POPs pesticides and POPs pesticides wastes)	Promote the “triple-rinse” technique for used, empty pesticides containers	Training and monitoring programme established	Ongoing	Department of Agriculture PTCCB	No Cost
Education and awareness of stakeholders (policy makers; customs, farmers NGOs and the public) (integrated in the awareness of HHPs (SAICM synergy)	Initiate safety training and awareness activities for the custom officers, retailers on identification of POPs, as well as on differentiating between counterfeit/illegal pesticides and allowed pesticides on the market.	Training and awareness conducted	Ongoing	Department of Agriculture PTCCB SKNBS	No Cost
	Initiate training activities of all stakeholders involved during the pesticides life-cycle on the environmental sound management of pesticides.	Training and awareness conducted	Ongoing	Department of Agriculture PTCCB SKNBS	No Cost
	Initiate awareness activities/initiatives/programmes on POP pesticides and proper usage including use of personal protective equipment (PPE), licensing and registration of pesticides, through the use of social media, newspapers and workshops.	Awareness activities conducted	Ongoing	Department of Agriculture PTCCB SKNBS Government Information Services	No Cost

3.3.4 Activity: Production, import and export, use, identification labelling, removal, storage, and disposal of PCBs and equipment containing PCBs (Annex A, Part II chemicals)

The test results obtained from the in-country sampling of PCBs and PCB-containing equipment in 2016 showed that all samples recorded PCBs concentrations lower than 50 ppm (the Stockholm Convention threshold for PCB contamination). Thus, the recommendations were that (1) no oil or equipment be tagged for disposal and (2) the oil from transformers and other pieces of equipment (that have not been tested for PCBs), should not be blended with the oil already demonstrated to be PCB-free.

In light of the level and the progress of the management of PCBs and PCB-containing equipment in Saint Kitts and Nevis, no new activities were proposed and the intervention detailed under the related priority (“Take administrative measures to prohibit the import and export of PCBs and PCB-containing equipment”, subchapter 3.3.2) continue to be relevant.

3.3.5 Activity: Production, import and export, use stockpiles, and wastes of hexaBDE and heptaBDE (Annex A, Part IV chemicals) and tetraBDE and pentaBDE (Annex A, Part V chemicals) HBCD (Annex A, Part VII), (and HBB, where applicable (Annex A, Part I chemicals))

The main industries in Saint Kitts and Nevis that use POP PBDEs (hexaBDE, heptaBDE, tetraBDE and pentaBDE) and HBCD include:

- Electrical and electronics industry;
- Transport industry;
- Furniture industry;
- Textiles industry; and
- Construction industry.

Inventories for both the electrical and electronic industry (EEE/WEEE), and the transport industry were established for Saint Kitts and Nevis. As a newly listed chemical in the SC, the major focus of activities in Saint Kitts and Nevis are on regulation related to disposal and management of waste from WEEE, polymers/plastics from derelict vehicles, and POP-PBDE-containing products as well as awareness among stakeholders and the public.

Table 3-4: Production, import and export, use stockpile, and wastes of hexaBDE and heptaBDE (Annex A, Part IV Chemicals) and tetraBDE and pentaBDE (Annex A, Part V Chemicals) HBCD (Annex A, Part VII), and HBB, where applicable (Annex A, Part I Chemicals)).

Priorities	Activities	Performance indicators	Time Frame	Responsible Agencies	Budget (XCD)
Establish a regulatory framework for management of POP-BFRs (hazardous chemicals) and related articles and waste categories.	Update/ enforce national legislation on POP-PBDEs, including regulatory framework for end of life vehicles and WEEE management, and, if present, also HBCD management, as well as on environmentally sound management	Relevant law (s) updated	36 months	Department of Environmental Health Solid Waste Management Agencies SKNBS	81,510
	Regulate and enforce usage and importation (since Saint Kitts and Nevis does not manufacture PBDEs and HBCD)	Regulations developed and implemented	36 months	Solid Waste Management Agencies Customs and Excise Department Traffic Department	
	Develop legislation to restrict import of used vehicles manufactured before 2005 (those manufactured in USA).	Law enacted by Parliament	36 months	Customs and Excise Department Traffic Department Attorney General's Chambers	

Priorities	Activities	Performance indicators	Time Frame	Responsible Agencies	Budget (XCD)
Update and refine inventory of PBDEs (with DecaBDE) and HBCD containing articles and wastes/resources and develop or update appropriate databases for information management.	Conduct in-depth POP-PBDEs inventory considering also the recently listed DecaBDE, as well as in-depth HBCD inventory.	Inventory completed	24 months	PTCCB SKNBS Solid Waste Management Agencies Customs and Excise Department	135,845
Sound Life Cycle Management of PBDE and HBCD product and waste categories (EEE/WEEE, end of life vehicle, insulation foam, and possibly textiles, furniture etc.)	Promote the implementation of the BAT/BEP for the recycling and waste disposal of articles containing PBDEs and for use of HBCD.	Awareness programme developed	Ongoing	PTCCB SKNBS Government Information Services	81,510
	Include the POP-PBDEs and HBCD waste in the general waste management framework.	Waste management framework updated	12 months	PTCCB Solid Waste Management Agencies SKNBS	No Cost

3.3.6 Activity: Production, import and export, use stockpile, and waste of DDT (Annex B, Part II chemicals) if used in the country

DDT has been banned for quite some time, and is not present on the list of approved chemicals that are permitted for entry into Saint Kitts and Nevis. However, it is unknown if DDT has entered Saint Kitts and Nevis illegally.

3.3.7 Activity: Production, import and export, use, stockpile, and wastes of PFOS, its salts and PFOSE (Annex B, Part III chemicals)

The major current use of PFOS and PFOS-related substances in Saint Kitts and Nevis is in firefighting foams used for hydrocarbon fires. The only national body that uses these PFOS/PFOS-containing foams is the Saint Kitts and Nevis Fire and Rescue Services. Additionally, foams

potentially containing PFOS and PFOS-related substances are stocked at RLB International Airport Fire Station and the Newcastle Fire Station (with a range of 26.44 kg to 79.33 kg). Thus, emissions of PFOS ranged from 2.92 kg and 8.77 kg.

As a newly listed chemical in the SC, the focus of activities in Saint Kitts and Nevis would be varied but must include decision on the need for exemptions, regulation related to use and disposal, refining of the inventory, as well as awareness among stakeholders and the public.

Table 3-5: Production, import and export, use, stockpile and waste of PFOS, its salts and PFOSE (Annex B, Part III Chemicals).

Priorities	Activities	Performance indicators	Time Frame	Responsible Agencies	Budget (XCD)
Establish policy and regulatory frame for the use, management and substitution of PFOS and related substances and PFAS in industrial uses and in products and waste (SAICM synergy)	Expand the scope of the PTCCB to include PFOS stakeholders (professional users)	PFOS stakeholder added to the PTCCB	3 months	PTCCB	No Cost
	Amend existing laws, or develop new laws related to the restriction on importation (more stringent) and control and management of PFOS and PFAS.	Relevant laws amended or enacted by Parliament	36 months	PTCCB SKNBS Attorney General's Chambers	81,510
	Decide on the need for exemption and registration of exemption.	Decision made and action taken	6 months	PTCCB	No Cost
Built knowledge and capacity for management of PFOS/PFAS containing products and waste categories)	Destruction or export of PFOS containing waste; ESM of PFAS containing products.	PFOS/PFAS waste/products disposed	36 months	PTCCB Fire and Rescue Services Department of Environmental Health	300,000
	Phase-out of materials containing PFOS/PFAS	PFOS/PFAS materials phased out	36 months	Fire and Rescue Services PTCCB	70,640

Priorities	Activities	Performance indicators	Time Frame	Responsible Agencies	Budget (XCD)
Apply BAT/BEP is in exempted uses	Proper labelling of products containing PFOS (and PFAS).	Products labelled	12 months	Fire and Rescue Services	No Cost
Assess PFOS alternatives in used/exempted uses and substitute PFOS with the most sustainable chemical and non-chemical solution)	Compile information on alternatives to PFOS and related substances (including fluorinated and non-fluorinated alternatives).	Information compiled and made available	6 months	Fire and Rescue Services PTCCB SKNBS	No Cost
	Research and development into alternative.	Feasible alternative confirmed	6 months	Fire and Rescue Services PTCCB	No Cost
Training and awareness raising for stakeholder groups on PFOS and PFAS and establishing approach for information exchange	Education and awareness drives on BAT/BEP for the management and use of PFOS/PFOS related firefighting foams. The target individuals should be fire fighters and other professional users of PFOS firefighting foam.	Awareness programme implemented	Ongoing	Fire and Rescue Services PTCCB SKNBS	81,510

3.3.8 Activity: Register for specific exemptions and the continuing need for exemptions (Article 4)

This sub-chapter is not applicable to Saint Kitts and Nevis. However, Saint Kitts and Nevis recognises that newly listed SCCPs and DecaBDE (listed in 2017), and PFOA (to be listed in May 2019), may require establishment of an informed registration process for needed exemptions. Consequently, Saint Kitts and Nevis may wish to assess if exemptions are needed for these POPs.

3.3.9 Activity: Measures to reduce releases from unintentional production (Article 5)

Under Article 5 Parties are obligated to undertake methods to decrease releases from anthropogenic sources of each of the chemicals indicated in Annex C of the Convention, with the goal of continued minimization and, elimination where possible.

The chemicals indicated in Annex C of the Convention are as follows:

- Polychlorinated dibenzo-p-dioxins (PCDDs)
- Polychlorinated dibenzofurans (PCDFs)
- Polychlorinated biphenyls (PCBs)
- Hexachlorobenzene (HCBs)
- Pentachlorobenzene (PCBs)
- Polychlorinated naphthalene (PCNs)
- Hexachlorobutadiene (HCBD)

Recognition of the significant potential for unintentional release of POPs chemicals, and the limitations of the present regulatory framework to address such releases, has made this activity another high importance within the NIP Action Plan.

A measure that is required by Article 5 is to construct and implement an action plan that is designed to identify, characterize and address the release of the chemicals indicated in Annex C and thus included under the NIP.

Among other measures required by Article 5, Parties are required to promote the application of measures to reduce unintentional release and the development, where appropriate, require the use of modified materials to prevent unintentional production and release. Furthermore, Parties require national action to promote awareness, train and encourage personnel to adopt best available techniques and best environmental practices.

The unintentional production and release of POPs from burning of waste was identified by the POPs inventory as the greatest contributor of highly toxic chemicals in Saint Kitts and Nevis. The awareness of these toxic pollutants is not well known and thus burning of waste is quite common and not performed with the use of the best possible techniques. These unintentional pollutants are released on day-to-day activities, hence the concern to remediate this problem.

The national priorities for achieving compliance with Article 5 of the Stockholm Convention are to:

- **Promote the use of BAT and BEP for existing waste incinerators**

There has not been an official inventory specific to existing sources that contribute to unintentional release of POPs, and thus, general sources are targeted, such as solid waste and medical waste incinerators and the burning of agricultural waste. Therefore, actions to reduce releases from these existing sources are focused but not limited to this category as more research will be done to acquire an updated inventory of existing sources. The actions required to encourage and ensure the use of BAT and BEP in waste incineration are detailed in Table 3-7.

- **Require the use of BAT and BEP for new source facilities**

The Stockholm Convention requires each Party to phase-in requirements for BAT to be used for new sources within 4 years of the entry into force of the Convention for that Party. Parties are also required in accordance with its action plan, to incorporate the use of BAT and BEP for all new sources. Saint Kitts and Nevis is expected to complete this phase-in by December 2018.

The Department of Physical Planning (Ministry of Sustainable Development) and the Department of Environment (Ministry of Agriculture) are responsible for control of environmental impacts of new developments, and as such perform and review environmental impact assessments (EIAs).

Accordingly, the provisions that should be taken to require/encourage the use of BAT and BEP by means are detailed in Table 3-7.

- **Develop and maintain source inventories and release estimates**

In order to meet the requirements of Article 5, Saint Kitts and Nevis must recognize and categorize unintentional releases of POPs and correspondingly, develop, update and maintain source inventories and release estimates. These inventories would inform the development of national priorities and measures to attend to these releases, and thus allow the success of the strategies to be assessed to determine effectiveness.

The Obsolete Pesticides Inventory and Environmental Risk Assessment were conducted during the year 2010 and the measures to reduce or eliminate unintentional releases developed based on the results of that inventory. There is a need to implement actions to refine the inventory to ensure quality of data is assured. The interventions/proposed activities are detailed in Table 3-7.

It is proposed that these actions are incorporated into the activities of air quality assessments of the Department of Environment (Ministry of Agriculture) and Department of Environmental Health (Ministry of Health).

- **Review the effectiveness of the measures taken to reduce releases of UPOPs**

A specific requirement under Article 5 is that there should be a review of the strategies to reduce UPOPs releases and their success evaluated every five years. The results of such reviews are to be included in reports submitted pursuant to Article 15 of the Convention. The specific reporting requirement for this Article is the review and evaluation of measures for reducing UPOPs releases to determine effectiveness.

Table 3-6: Measures to reduce releases from unintentional production (Article 5).

Priorities	Activities	Performance indicators	Time Frame	Responsible Agencies	Budget (XCD)
Promote the use of BAT and BEP for existing waste incinerators to reduce or eliminate UPOPs	Perform environmental audits at municipal solid waste and medical waste incinerators. This activity would also contribute to the upgrading of subsequent national inventories of UPOPs.	Audits completed	Ongoing	Department of Environment Department of Environmental Health	54,340
	Implement BAT and BEP awareness and training among personnel at waste incinerators, and regulatory personnel. This activity should be preceded by on-site assessments of the techniques and practices in use at the targeted facilities.	Awareness programme implemented	Ongoing	PTCCB Department of Environmental Health SKNBS	81,510
Require the use of BAT and BEP for new source facilities	Incorporate BAT and BEP considerations as part of environmental impact assessments for future developments in the pertinent source categories.	Awareness programme implemented	As Needed	PTCCB Department of Environmental Health SKNBS	No Cost
Develop and maintain source inventories and release estimates	Identify, in conjunction with stakeholders, measures to address data gaps and requirements for sound management of UPOPs.	Gap Analysis conducted	12 months	PTCCB SKNBS	250,000
	Development of a system to update the dioxins and furans inventory.	Inventory system developed	12 months	Department of Environment	
	Implement air quality monitoring assessment plan to determine release estimates/ quantification of HCB and PCBs with appropriate guidance.	Air quality monitoring assessment plan implemented	12 months	Department of Environmental Health	

Priorities	Activities	Performance indicators	Time Frame	Responsible Agencies	Budget (XCD)
Review the effectiveness of the measures taken to reduce releases of UPOPs	Review and evaluation of measures for reducing UPOPs releases to determine effectiveness.	Monitoring and evaluation programme developed	Ongoing	PTCCB	No cost
Establish policy and legal framework for reduction and minimization of unintentional POPs (PCDD/Fs, PCNs, HCB, PCBs and HCBD)	Amend existing laws, or develop new laws where necessary, related to the management of UPOPs possibly within an integrated pollution prevention and control approach	Relevant laws amended or enacted by Parliament	24 months	PTCCB Department of Environmental Health Attorney General's Chambers SKNBS	81,510
Reduce releases from open burning of wastes (private burning & landfill fires) and biomass burning by improvement of waste management (waste hierarchy; circular economy)	Implement sound management of waste especially in the area of collection of white and bulk goods.	ESM Techniques implemented	Ongoing	Solid Waste Management Agencies	300,000
Establish monitoring of PCDD/F and other UPOPs and relevant pollutants from Annex II and III sources and	Monitoring and assessment and securing of potentially contaminated sites (i) Assessment of sites where e-waste and cable burning take place (ii) Assessment of the impact of landfill open burning on the vicinity	Monitoring programme developed and Assessment completed	12 months 24 months	Solid Waste Management Agencies PTCCB Department of Environment	330,000

Priorities	Activities	Performance indicators	Time Frame	Responsible Agencies	Budget (XCD)
human exposure) Identification, assessment and management of potentially Dioxin/UPOPs contaminated sites and securing /remediation				Department of Environmental Health	
	Update the national disaster plan to include UPOPs.	National disaster plan updated	6 months	PTCCB National Emergency Management Agency (NEMA) SKNBS	No Cost
	Identify, secure and develop a database of the potentially UPOPs contaminated sites in Saint Kitts and Nevis.	Database developed	6 months	PTCCB Ministry of Health SKNBS	No Cost

3.3.10 Activity: Identification and management of stockpile, waste and article in use, including release reduction and appropriate measures for handling and disposal (Article 6)

Under Article 6 Parties are obligated to undertake measures to manage releases from stockpiles and wastes consisting of or containing chemicals listed in Annex A or Annex B wastes in an environmentally sound manner. A stockpile may be defined as a pile or storage location of POPs chemicals or equipment or materials containing or contaminated with POPs for which there are still allowed uses in a country according to the register of specific exemptions and the list of acceptable purposes in Annexes A and B of the Convention. A stock is considered to be waste if that stock no longer has permitted use under the terms of Annex A or Annex B.

Article 6 of the Stockholm Convention requires parties to develop appropriate strategies to identify stockpiles consisting of or containing chemicals listed in Annex A, B or C. When identified, Parties are responsible for the implementation of strategies for environmentally sound management of the stockpiles. Parties should also endeavour to construct a plan of suitable strategies for identifying sites contaminated by chemicals listed in Annex A, B or C. The Convention does not require remediation of these sites, but remediation of any possible sites should be done in an

environmentally sound manner. Any retrieval, recycling reclamation or reuse of POPs is not allowed. Wastes should not be transported across international boundaries without taking into account relevant international rules, standards and guidelines, such as those of the Basel Convention.

The national priorities for achieving compliance with Article 6 of the Stockholm Convention are to:

- **To take measures so that wastes are disposed of in an environmentally sound manner**

A priority recognized by stakeholders during the Convention impact appraisal was that these wastes should be disposed of safely at the earliest possible opportunity. Unfortunately, Saint Kitts and Nevis has neither the infrastructure or the capacity for disposal of POPs waste or other hazardous chemical waste in an environmentally sound manner. Consequently, hazardous waste is stored at sanitary landfills. The provisions that should be taken to ensure that wastes are disposed in an environmentally sound manner are detailed in Table 3-8.

- **To identify stockpiles, products and articles in use and waste consisting of, containing or contaminated by POPs chemicals**

The aforementioned Obsolete Pesticides Inventory was done in 2010 and thus requires updating as new POPs are included in the Stockholm Convention. It will be necessary to develop/revise inventories to identify products in use and wastes consisting of, or contaminated with, such new POPs. Also, identification and classification of sites potentially contaminated with POPs should be included as the inventory does not provide any information regarding this issue. In order to address this priority, several interventions were proposed (Table 3-8).

- **To ensure the management and remediation of stockpiles/waste products in an environmentally sound manner**

In parallel with Articles 3 and 5, this action represents the highest level of importance in the NIP Action Plan. Its focus is addressing the POPs and related chemical wastes in SKN and ensuring that the strategies are implemented to guarantee effective management of future chemical waste generation, including POPs wastes. This involves a programme to collect and provide secure consolidated storage for POPs that would not otherwise be afforded an adequate level of care and custody.

Table 3-7: Identification and management of stockpiles, waste and article in use, including release reduction and appropriate measures for handling and disposal (Article 6).

Priorities	Activities	Performance indicators	Time Frame	Responsible Agencies	Budget (XCD)
Take measures so that wastes are disposed of in an environmentally sound manner	Establish a secure storage site for POPs pesticides and other unwanted pesticides.	Storage site identified	6 months	Solid Waste Management Agencies PTCCB SKNBS Department of Environment	30,000
Identify stockpiles, products and articles in use and waste consisting of, containing or contaminated by POPs chemicals	Risk assessment of potentially contaminated POPs chemicals (stockpiles, products, articles)	Risk assessment completed	12 months	Solid Waste Management Agencies	68,000
	Regular updating of inventory.	Inventory updated	Ongoing	PTCCB	14,000
	Provide training in good pesticides stock management, including storage, record-keeping and stock taking and the use of adequate personal safety measures for personnel in the relevant fields.	Training activities conducted	Ongoing	SKNBS Department of Agriculture	No cost
Ensure the management and remediation of stockpiles/waste products in an environmentally sound manner	Develop a suitable management plan and remediate stockpiles/waste products in an environmentally sound manner.	Management plan developed	24 months	Solid Waste Management Agencies PTCCB SKNBS Department of Agriculture	570,000
	Develop and implement remediation strategies.	Strategies implemented	24 months	Department of Environment	

3.3.11 Activity: Identification of contaminated sites (Annex A, B, and C Chemicals) and, where feasible, remediation in environmentally sound manner

All parties to the SC are required to develop strategies to identify sites contaminated with POPs and while the Convention does not explicitly require remediation of these sites, it stipulates that remediation is carried out in an environmentally sound manner. Table 3-9 details the proposed interventions/activities towards identification of POPs contaminated sites.

Table 3-8: Identification of contaminated sites (Annex A, B and C Chemicals), securing and remediation in an environmentally sound manner.

Priorities	Activities	Performance indicators	Time frame	Responsible Agencies	Budget (XCD)
Establish a regulatory framework for contaminated sites	Develop/update legislation to set criteria for determining contaminated sites for relevant POPs.	Legislation is enacted by Parliament	48 months	PTCCB Department of Environment Attorney General's Chambers SKNBS	81,510
	Develop/update legislation on liability related to contamination and clean-up procedures. (Polluter Pays Principle (PPP)).	Legislation is enacted by Parliament	48 months	PTCCB Department of Environment Attorney General's Chambers SKNBS	81,510
Develop methodology to identify, assess and prioritize POPs contaminated sites considering available guidance documents	Develop methodology to identify, assess and prioritize sites contaminated with Annex A, B and C chemicals	Methodology implemented	24 months	PTCCB Department of Environment Department of Environmental Health SKNBS	54,000
	To participate in or to follow the UNEP working group on POPs contaminated sites.	Working group reports completed and disseminated	Ongoing	PTCCB SKNBS	No Cost

Priorities	Activities	Performance indicators	Time frame	Responsible Agencies	Budget (XCD)
Secure POPs contaminated sites, and where feasible conduct remediation of contaminated sites	Identify potential remediation technologies available.	Remediation technologies identified	24 months	PTCCB Department of Environment Department of Environmental Health SKNBS	300,000
	Seek opportunities to train and upgrade skills of personnel in the assessment, securing and remediation of contaminated sites.	Number of personnel trained	36 months	PTCCB Department of Environment Department of Environmental Health SKNBS	

3.3.12 Activity: Facilitating or undertaking information exchange and stakeholder involvement

This activity supports the establishment of a system for information exchange on POPs at the national, regional and international level. Parties have to provide the access to updated information on the activities aimed at reducing/eliminating POPs and the impact on humans health and the environment. Exchange of information among Parties to the Stockholm Convention is conducted through the National Focal Points and with the support of the Secretariat of the Stockholm Convention. The development of a comprehensive strategic information exchange and communication plan is one step towards successful implementation of the NIP. The communication plan will ensure that the public is aware of POPs management issues through various media and encourage buy-in.

Table 3-9 Facilitating or undertaking information exchange and stakeholder involvement.

Priorities	Activities	Performance indicators	Time frame	Responsible Agencies	Budget (XCD)
Information exchange on POPs in the region and internationally	<p>Development of a mechanism that information generated in the Stockholm, Basel and Rotterdam Secretariat and SAICM Secretariat reach the country and the stakeholders.</p> <p>Mechanism that information on POPs from the country with regional or international relevance are communicated to the regional Basel and/or Stockholm centres and to the BRS secretariat.</p>	POPs information disseminated regularly	Ongoing	<p>PTCCB</p> <p>Department of Agriculture</p> <p>Department of Environment</p> <p>SKNBS</p>	No Cost
Access of information and documents for national stakeholders	Establish mechanism that key documents, information and news on POPs and hazardous chemicals can be found by stakeholders.	Websites, social media platforms etc. regularly updated	Ongoing	<p>PTCCB</p> <p>SKNBS</p>	No Cost

3.3.13 Activity: Public and stakeholder awareness, information and education (Article 10)

Under Article 10 Parties are required to promote and facilitate awareness, information dissemination and training among various groups, including workers, scientists, educators, technical and managerial personnel, youth and the public. Parties are also requested to encourage stakeholders, such as industry and professional users, to promote and facilitate the provision of information on POPs.

There has not been any targeted awareness programmes related to POPs undertaken in SKN, prior to the initiation of the NIP preparation work. It is recommended that other governmental and non-governmental organizations, for example the Ministry of Agriculture and the Labour Department, be closely involved in the delivery of such awareness programmes.

Considering the requirements of the Stockholm Convention and the recommendations of the Impact Appraisal, the following priority has been identified: To increase awareness of the policy and decision makers and public on POPs.

To increase awareness of the policy and decision makers and the public on POPs

The parties, as well as key stakeholders from public and private sectors involved in implementing the action plan, will have information concerning the level of awareness of key stakeholders and the general public. Also, risk groups and the general public should be provided with education and awareness raising programmes on POPs. At the level of the households many Saint Kitts and Nevis residents are not aware of the health impacts of household chemicals. There is a clear need to educate the public about the hazards associated with POPs pesticides and with the inappropriate use of pesticides in general. The interventions necessary to address this priority are detailed in Table 3-11.

Table 3-10: Public, Policy/Decision Makers and Stakeholder awareness, information and education (Article 10).

Priorities	Activities	Performance indicators	Time Frame	Responsible Agencies	Budget (XCD)
Increase awareness of the public, policy /decision makers and stakeholders on POPs	Preparation of educational materials on POPs	Materials readily available	Ongoing	PTCCB	68,000
	Conduct seminars/workshops for public, policy /decision makers and stakeholders involved in POPs management.	Number of workshops conducted	Ongoing	Department of Agriculture Department of Environment SKNBS	

3.3.14 Activity: Effectiveness evaluation (Article 16)

This sub-chapter is not relevant to Saint Kitts and Nevis.

3.3.15 Activity: Reporting (Article 15)

Saint Kitts and Nevis has sought to improve its mechanisms for collecting, compiling and managing data, as well as providing the statistical information needed to comply with Article 15 of the Stockholm Convention, in which it states that each Party has the responsibility to inform the Conference of the Parties of the measures adopted to enforce the provisions of the Convention, as well as the effectiveness of said measures.

Table 3-11: Reporting (Article 15)

Priorities	Activities	Performance indicators	Time Frame	Responsible Agencies	Budget (XCD)
Comply with Article 15 reporting	Compile information for reporting (updated inventory and other information) Submit report to the secretariat (website)	Reporting achieved according to the deadline	Reporting for 2018 then every 4 years	SKNBS	No cost
	Train officers to fulfil reporting requirements	Trained officers	On going	SKNBS	
	Incorporate reporting on POPs into the annual report of the department responsible for environmental protection	Report updated and completed	Annual	PTCCB Department of Environment SKNBS	
	Regular reporting on implementation of action plans and strategies identified in the NIP	Reports completed and disseminated	Ongoing	SKNBS	

3.3.16 Activity: Research, development and monitoring (Article 11)

The Stockholm Convention requires in Article 11, encouragement and undertaking of appropriate research, development, monitoring and cooperation pertaining to POPs. There is need for an investigative monitoring programme to determine the levels of POPs in the environment of Saint Kitts and Nevis. The activities of such a programme are outlined in Table 3-14.

No specific research and development activities for developing POPs destruction technologies or for alternate pesticides (to DDT) are proposed. As previously stated, DDT has been banned for many years and there are no stocks in the country. Consequently, the research activities are limited to environmental monitoring.

Table 3-12 Research, development and monitoring (Article 11)

Priorities	Activities	Performance indicators	Time Frame	Responsible Agencies	Budget (XCD)
Monitoring and analysis of POPs and other chemicals	Upgrade laboratories for testing and analysis.	Upgraded laboratories	36 months	SKNBS Department of Agriculture Department of Environmental Health	400,000
	Develop a monitoring and analysis plan to investigate levels of POPs and chemicals. Also, implementation of a database to record the actions taken and to monitor the established indicators.	Monitoring and analysis plan developed			136,000
	Monitoring health of agricultural and industry workers exposed to POPs and chemicals, and equipment containing POPs and chemicals.	Monitoring programme implemented	24 months	Ministry of Health Department of Labour	130, 000
	Access technical assistance from countries with well-established POPs monitoring and analysis programme. a. Identify, contact and collaborate with countries that have experience in POPs monitoring and analysis. b. Mobilize financial and technical assistance to enable monitoring POPs.	Technical assistance received	Ongoing	SKNBS	In-kind

3.3.17 Activity: Technical and financial assistance (Article 12 and 13)

Table 3-13 Technical and financial assistance (Article 12 and 13).

Priorities	Activities	Performance indicators	Time frame	Responsible Agencies	Budget (XCD)
Source technical assistance towards the successful implementation of the Convention (Article 12)	Assess technical needs Identify sources of technical assistance Request technical assistance	Technical assistance received	Ongoing	SKNBS	In-kind
Source financial assistance towards the successful implementation of the Convention	Assess financial needs Identify sources of financial assistance Request financial assistance through proposal writing	Financial assistance received	Ongoing	SKNBS	No Cost

3.4 DEVELOPMENT AND CAPACITY-BUILDING PROPOSALS AND PRIORITIES

I. Development/Amendment of specific (existing) legislation/legal instruments on sound management of chemicals and hazardous waste

There is a need to assess and develop/update the national legislative and regulatory framework for chemicals management including all POPs. Of particular importance are the newly listed POPs, POP-PBDE/HBCD as it pertains to the management of ELV and WEEE; proper disposal/recycling of the polymers/plastics/foams in ELV. The newly listed chemical PFOS/PFAS and its related chemicals necessitate new laws related to the restriction on importation and control and an integrated approach to the management of these POPs and other hazardous chemicals and their waste. Generally, existing laws may need to be amended, or new laws developed where necessary. In some cases, the scope of legislation needs to be expanded and there should be greater cohesion in laws to allow for better enforcement.

Effective, well-written and enforced legislation on chemicals management will ensure sustainable management of both land and water resources and protection of the country's food supply through the use of safer alternatives.

This priority area contributes to SDG 3, 4, 8, 9, 11, 12 and 16.

II. Education, training/capacity building and awareness-raising on chemicals management issues including hazardous and chemical waste

Education and awareness on all groups of POPs including the newly listed POPs (POP pesticides, PFOS, PBDE/HBCDs, PFOS, PCDD/Fs and other UPOPs) has to be targeted towards the key stakeholders; public, government officials, policy makers, waste managers/officers, recyclers, custom officers, farmers, firefighters, etc. Additionally, training on the use of Best Available Technologies (BAT) and Best Environmental Practises (BEP) for chemical and waste management among stakeholders is necessary. These initiatives will ultimately have an impact on human behaviour, which can lead to changes in consumption patterns, safety measures employed and disposal practices. Thus, the impact of POPs and other hazardous chemicals on relevant environmental media, water supply and food resources will be minimized and more sustainable. Education and awareness must be an integral part of any holistic and integrated approach to addressing Saint Kitts and Nevis's priority areas.

The priority contributes to SDG 1, 2, 3, 5, 8, 9, and 12 and 16.

III. Improvement of waste management and introduction of waste hierarchy towards circular economy and reduction of unintentionally formed POPs from open burning

There is a need to change the perception of waste to that of a resource and embrace the concept of waste hierarchy towards a circular economy (e.g. recycling). It is important to improve management of waste from POPs (PBDE/HBCD, PCB, pesticides, etc.) and the relevant waste material streams. This priority will have far reaching impacts on interconnected environmental issues thus generating multiple benefits for the country. Such benefits may include jobs for waste-pickers and/or recyclers. Additionally, reducing releases from open burning of wastes (domestic/private burning and landfill fires) through use of more integrated waste management strategies, not only reduces exposure to POPs but also to other co-pollutants (PAHs, soot, particulates, dangerous gases, etc.) and thus reduces risks to human health and vulnerable environmental media.

General improvement in waste management and implementation of waste hierarchy towards a more circular economy include benefits related to integration of GEF 7 priorities, potential for job creation and contribution to SDGs (2, 3, 6, 7, 8, 9, 11, 12, 13).

IV. Contaminated site assessment and management

Potentially POPs contaminated sites from all POPs groups due to historic or current POP related activities is a reality in Saint Kitts and Nevis like other Caribbean countries. Thus, activities related to assessment, identification, mapping, securing and remediation of such sites are considered as very high priority in these islands. Sound management of waste is urgently needed. Potentially POPs-contaminated sites (PFOS) can threaten the safety of water sources (groundwater and surface water), aquatic organisms (and associated food chains), grazing animals and humans that

consume these animals. These potentially contaminated sites need to be sampled and tested for the presence of POPs. The lack of capacity and financial resources would initially require external financial assistance with the hope of Saint Kitts and Nevis becoming self-reliant in the near future.

The priority and associated activities would contribute to SDG 3, 6, 11, 14 and 15.

V. Monitoring of POPs, initiating research and collaborations

Continuous monitoring of POPs in food, food products, environmental media (ground water, soil, sediment) and human breast milk has to be a priority in order to protect human life. Of equal importance is research on specific sectors of the population where exposure to POPs is most likely; firefighters, solid waste management workers, recyclers etc. There is a lack of capacity for POPs monitoring in Saint Kitts and Nevis thus heavy reliance on external sources and funding is essential. Information on POP levels in food, humans, water sources and soil will contribute to refining the country's priorities and lead to effective implementation of the SC.

The priority contributes to SDG 1, 2, 3, 5, 8, 9, and 12 and 16.

VI. BAT/BEP for Dioxin/UPOPs reduction and integrated pollutant prevention and control

Improvements are needed in air quality monitoring related to releases of dioxins/UPOPs from for example medical incinerators. Also, it was revealed that no emission standards are in place in Saint Kitts and Nevis. Thus, there is urgent need to establish emission limits and the related legislation. BAT and BEP have to be incorporated within into any appropriate emission limits established. This would be combined with an integrated pollution prevention and control mechanism as mentioned in the Stockholm Convention BAT/BEP guidelines.

The implementation of BAT/BEP contribute to the overall reduction of pollution release and is an important cornerstone for the overall reduction and control of soil, air and water pollution. BAT/BEP also can contribute to reduction of energy consumption and related Greenhouse gas emissions. Using BAT/BEP in an integrated pollution prevention and control framework with industries (and other sectors) will contribute to an integrated approach to tackling interconnected environmental issues and generating multiple benefits aligned to the GEF 6 and 7 strategies. This priority contributes to SDG 2, 3, 6, 11 and 12 and can also contribute to SDG 1 and 8 if the local working force and technologies are used.

3.5 TIMEFRAME FOR THE IMPLEMENTATION STRATEGY AND ACTION PLANS

The individual action plans items in sub-chapter 3.3 consist of individual timeframes for implementing the corresponding activities. The timeframes vary from short term (6 months) to medium term (48 months) and also include ongoing activities.

3.6 RESOURCES AND REQUIREMENTS

Table 3-14 presents the total projected costs estimates for the quantifiable priority areas/activities in the NIP. It is important to note that these are rough estimates and would require review to reflect the actual cost of activities at the time of implementation. Saint Kitts and Nevis is aware that the financial resources from GEF and other international funding agencies/organizations may not be sufficient to cover the full implementation costs of proposed activities; hence co-funding is a consideration.

The Government may consider regional projects aligned to the NIP implementation to attract regional funding by international agencies.

Additionally, it may be necessary for the Government/relevant agency to mobilise the participation of the related domestic economic sectors, as well as investors for the implementation of the National Plan. Additionally, the Government/relevant agency may use campaigns and other approaches to attract capital and take advantage of the financial resources available from international financial organizations.

The NIP will be implemented through mobilization of various finance resources such as state budget, bilateral grant aid/agreements, GEF grants, extended producer responsibility contribution, polluter pays principle contributions, loans, financing from organizations and individuals (citizens), etc. For example, the estimated cost for contaminated site assessment could come from the owner of the contaminated site. Furthermore, some of the proposed activities can partly be financed by the regular waste management budget since PBDE in e-waste or end-of-life vehicles belongs to the general waste management tasks of the country. Here, funding can come largely from extended producer responsibility and for vehicles and some of the electronics, co-funding can from the value of the resources in the waste.

Considering the larger share of co-funding needed for GEF projects, appropriate and robust co-funding sources and approaches are needed. The following approaches and strategies may be considered for co-funding:

- The SC NIP will be coordinated and integrated where appropriate with other related national plans and programs on waste management, resources management, sustainable

development, climate change, or programs or projects on science and technology, in order to attract investments and increase capital efficiency. By linking to general chemical and waste management, co-funding can partly come from national budgets dedicated to chemical and in particular to waste management.

- For the management of POPs contaminated stocks and wastes, extended producer responsibility (EPR) contributions can become an important funding source for the environmentally sound management of waste fractions. Several waste fractions related to POPs can be addressed by an extended producer responsibility frame:
 - E-waste including e-waste plastic
 - End of life vehicle (including the polymers)
 - Empty pesticides containers and stockpiles
 - Synthetic carpets

The implementation of extended producer responsibility needs the development of a respective policy and regulatory framework. Consumers need to bear a part of the cost of waste management since a range of POPs is included in consumer products.

In setting-up funding for waste management, the value of the waste needs to be considered as co-financing sources. For example, vehicles have an inherent value (200 to 400 USD) based on the metal content and this value can be used to also manage the non-valuable fraction of plastic, polymers and pollutants. Particular e-waste fractions have a value and can contribute to financing e-waste management. This requires the development of a waste management framework, which allows for the separation of valuables like metals and consideration of the management of the non-valuable fractions.

- Owners of POP waste have to contribute a considerable share of the management cost:
 - Owners of PCBs (utility sector) have major responsibility for a large share of the PCB containing transformers and other equipment
 - PFOS firefighting foams
 - End of life vehicle (including the polymers)
- The improvement of recycling and recovery schemes also can contribute to financing of waste management including POPs management. The separation of recyclable plastic also reduces the volume of the plastic fraction to be treated.
- The polluter pays principle (PPP) can likely be used in the area of contaminated sites and hot spots. Before the principle can be applied the related regulatory framework needs to be set-up so that PPP can be used as co-financing source.

Table 3-14: Estimated budget for priority activities for POPs management in Saint Kitts and Nevis.

National Priorities (detailed are in sub-chapter 3.3)	Estimated Budget XCD
Development/Amendment of specific (existing) legislation/legal instruments on sound management of chemicals and hazardous waste (648,045 XCD).	
Develop an adequate legislative framework and policy for POPs pesticides.	240,495
Establish a regulatory framework for management of POP-BFRs (hazardous chemicals) and related articles and waste categories.	81,510
Establish policy and a regulatory framework for the use, management and substitution of PFOS and related substances and PFAS in industrial uses and in products and waste (SAICM synergy).	81,510
Establish policy and legal framework for reduction and minimization of unintentional POPs (PCDD/Fs, PCNs, HCB, PCBs and HCBD).	81,510
Establish a regulatory framework for contaminated sites.	163,020
Education, training/capacity building and awareness-raising on chemicals management issues including hazardous and chemical waste (149,510 XCD).	
Training and awareness raising for stakeholder groups on PFOS and PFAS and establishing approach for information exchange	81,510
Increase awareness of the public on POPs	68,000
POPs stockpile management and improvement of waste management and introduction of waste hierarchy towards circular economy and reduction of unintentionally formed POPs from open burning (1,434,150 XCD).	
Sound Life Cycle Management of PBDE and HBCD product and waste categories (EEE/WEEE, end of life vehicle, insulation foam, and possibly textiles, furniture etc.)	81,510
Reduce releases from open burning of wastes (private burning & landfill fires) and biomass burning by improvement of waste management (waste hierarchy; circular economy)	300,000
Take measures so that wastes are disposed of in an environmentally sound manner	30,000
Identify stockpiles, products and articles in use and waste consisting of, containing or contaminated by POPs chemicals	82,000
Ensure the management and remediation of stockpiles/waste products in an environmentally sound manner	570,000
Built knowledge and capacity for management of PFOS/PFAS containing products and waste categories)	370,640
Assessment and management of contaminated sites (354,000 XCD).	
Develop methodology to identify, assess and prioritize POPs contaminated sites considering available guidance documents	54,000
Secure POPs contaminated sites, and where feasible conduct remediation of contaminated sites	300,000
Monitoring of POPs, initiating research and collaborations (996,000 XCD).	
Monitoring and analysis of POPs and other chemicals	666,000
Establish monitoring of PCDD/F and other UPOPs and relevant pollutants from Annex II and III sources and human exposure)	330,000

National Priorities (detailed are in sub-chapter 3.3)	Estimated Budget XCD
Identification, assessment and management of potentially Dioxin/UPOPs contaminated sites and securing /remediation	
BAT/BEP for Dioxin/UPOPs reduction and integrated pollutant prevention and control (136,350 XCD).	
Promote the use of BAT and BEP for existing waste incinerators to reduce or eliminate UPOPs	136,350
Update and refining of inventories (385,845 XCD).	
Update and refine inventory of PBDEs (with DecaBDE) and HBCD containing articles and wastes/resources and develop or update appropriate databases for information management.	135,845
Develop and maintain source inventories and release estimates	250,000
Estimated costs for quantifiable priorities	4,103,900

REFERENCES

- Asplund L, Svensson BG, Nilsson A, et al. (1994). PCB, p,p'-DDT and p,p'-DDE in human plasma related to fish. *Arch Environ Health*. 49, 477-486.
- AMAP (Arctic Monitoring and Assessment Programme). (2004). *AMAP Assessment 2002: Persistent Organic Pollutants in the Arctic*. Arctic Monitoring and Assessment Programme (AMAP), Oslo, Norway. xvi +310 pp.
- Animals (International Movement and Diseases) Act. No. 1 of 1987.
- Arisawa K, Takeda H, Mikasa H. (2005). Background exposure to PCDDs/PCDFs/PCBs and its potential health effects : a review of epidemiologic studies, *J Med Invest*. 52(1-2), 10-21.
- Biosafety Act. No. 14 of 2012.
- Brambilla G, D'Hollander W, Oliaei F, Stahl T & Weber R. (2015). Pathways and factors for food safety and food security at PFOS contaminated sites within a problem based learning approach. *Chemosphere*. 129,192-202.
- Caribbean EcoHealth Programme. (2012). *Prenatal exposure to Persistent Organics Pollutants (POPs), Pesticides, and Heavy Metals in the CARICON Region*.
- Cohen and Liza Oates. (2007). *Human Consumption Of Agricultural Toxicants From Organic And Conventional Food*, Wellness Group, School of Health Sciences, RMIT University, Melbourne, Australia.
- FAO (Food and Agriculture Organization). (2012). *Pesticide residues in food 2012 Joint FAO/WHO Meeting on Pesticide Residues*. Report of the Joint Meeting of the FAO Panel of Experts on Pesticide Residues in Food and the Environment and the WHO Core Assessment Group on Pesticide Residues Rome, Italy, 11-20 September 2012.
- FAO (Food and Agriculture Organization). (2016). http://www.fao.org/agriculture/crops/news-events-bulletins/detail/en/item/1109645/icode/?no_cache=1 Accessed March 2018
- Forde M and Dewailly E. (2012). *Prenatal exposure to Persistent Organic Pollutants (POPs), pesticides, and heavy metals in the CARICOM Region: CARICOM Report*, October 2012. Caribbean EcoHealth Programme (CEHP).
- GUT (2011). *PBPK modeling for PFOS and PFOA: Validation with human experimental data* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4159678/>
- Hu X C, Andrews D Q, Lindstrom A B, Bruton T A, Schaidler L A, Grandjean P, Lohmann R, Carignan C C, Blum A, Balan S A, Higgins C P, and Sunderland E M. *Detection of Poly- and Perfluoroalkyl Substances (PFASs) in U.S. Drinking Water Linked to Industrial Sites, Military Fire Training Areas, and Wastewater Treatment Plants*. *Environ. Sci. Technol. Lett.*, 2016, 3 (10), 344–350.
- Hutchinson S. (2016). *Saint Kitts Strategy and Action Plan for Agriculture (2017-2021)* Government of Saint Kitts And Nevis Basseterre, Saint Kitts & Nevis December, 2016.
- IDB (Inter-American Development Bank). (2013). *The Private Sector Assessment Report (PSAR)*

- Jakobsson E and Asplund L (2000). Polychlorinated Naphthalenes (PCNs) <http://www.bookmetrix.com/detail/chapter/66099ae2-ca1c-4e99-988a-09fcfc1e50c6#citations> Accessed March 2018.
- National Bureau of Standards Act. Cap 23.15. Rev 31 Dec 2002. Government of Saint Kitts and Nevis.
- National Conservation and Environment Protection Act. No. 5 of 1987. Government of Saint Kitts and Nevis.
- National Disaster Management Act. No. 5 of 1998. Government of Saint Kitts and Nevis.
- CARPHA (Caribbean Public Health Agency). (2017a). National Inventory Report of POPs Pesticides in Antigua and Barbuda. 2017. GEF 5558: Development and Implementation of a Sustainable Management Mechanism For Persistent Organic Pollutants (POPs) in the Caribbean.
- CARPHA (Caribbean Public Health Agency). (2017b). National Inventory Report of listed Polybrominated Diphenyl Ethers (POP-PBDEs), Hexabromobiphenyl (HBB) and Hexabromocyclododecane (HBCD) in Antigua and Barbuda. 2017. GEF 5558: Development and Implementation of a Sustainable Management Mechanism For Persistent Organic Pollutants (POPs) in the Caribbean.
- CARPHA (Caribbean Public Health Agency). (2017c). National Inventory Report of Perfluorooctane Sulfonic Acid (PFOS) and Related Chemicals in Antigua and Barbuda. 2017. GEF 5558: Development and Implementation of a Sustainable Management Mechanism For Persistent Organic Pollutants (POPs) in the Caribbean.
- CARPHA (Caribbean Public Health Agency). (2017d). National Inventory Report of Unintentional POPs (UPOPs) in Antigua and Barbuda. 2017. GEF 5558: Development and Implementation of a Sustainable Management Mechanism For Persistent Organic Pollutants (POPs) in the Caribbean.
- OECS Ship and Waste Management. (2003). OECS Solid and Ship-Generated Waste Management Project Unit https://www.google.gy/search?source=hp&ei=twXWWq7vNNGyZWl80bCADg&q=OECS+Ship+and+Waste+Management%2C+2003&oq=OECS+Ship+and+Waste+Management%2C+2003&gs_l=psy-ab.3...1150.1150.0.2173.1.1.0.0.0.130.130.0j1.1.0...0...1c.2.64.psy-ab..0.0.0...0.ioDC-6ZIBj8 Accessed March 2018
- Pesticides and Toxic Chemicals Control Act. Cap 9.18. Rev 31 Dec 2009
- Plant Protection Act. Cap 14.09. Rev 31 Dec 2002.
- POPRC (POP Reviewing Committee). (2016). Report on PFOS Alternatives: “POPs in Articles and phase-out opportunity” publication <http://poppub.bcrc.cn/col/1408693347502/index.html>
- Rapid Assessment and Inventory of Stored PCB Oil and PCB Contaminated Equipment for Disposal (2016). Development and Implementation of a Sustainable Management Mechanism For PPOs In The Caribbean GEF #5558.

- Saint Kitts and Nevis Country Report. (2018). GEF 5558 – Development And Implementation of Sustainable Management Mechanism for Persistent Organic Pollutants (Pops) In Eight (8) Caribbean Countries. Mainstreaming Of Sound Chemical Management Into National Policy And Plans For Eight (8) Caribbean Countries. Reference Number: BCRC#5558_2017_001.
- Saint Kitts and Nevis NIP. (2014). Saint Kitts and Nevis National Implementation Plan for the Management of Persistent Organic Pollutants.
- Saint Kitts and Nevis Minamata Initial Assessment Report. (2018).
- Saint Christopher (Saint Kitts) and Nevis The Private Sector Assessment Report (PSAR) for Saint Kitts and Nevis.
- Saint Kitts and Nevis Pesticides and Toxic Chemicals Control Board. (2010). *Saint Kitts-Nevis Obsolete Pesticides Inventory and Environmental Risk Assessment Report*.
- Schaider LA, Balan SA, Blum A et al. (2017). Fluorinated Compounds in U.S. Fast Food Packaging. *Environ Sci Technol Lett*. 4(3), 105–111.
- Secretariat of the Stockholm Convention. (2015a). Guidance for the Inventory of commercial Pentabromodiphenyl ether (c-PentaBDE), commercial Octabromodiphenyl ether (c-OctaBDE) and Hexabromobiphenyls (HBB) under the Stockholm Convention on Persistent Organic Pollutants; Draft. UNEP/POPS/COP.7/INF/27.
- Secretariat of the Stockholm Convention. (2015b). Guidance for the inventory, identification and substitution of Hexabromocyclododecane (HBCD) (Draft March 2015).
- Secretariat of the Stockholm Convention. (2015c). Revised draft guidance for the inventory of perfluorooctane sulfonic acid and related chemicals listed under the Stockholm Convention. UNEP/POPS/COP.7/INF/26.
- Secretariat of the Stockholm Convention. (2017a). Draft guidance on preparing inventories of hexachlorobutadiene (HCBD). UNEP/POPS/COP.8/INF/18
- Secretariat of the Stockholm Convention. (2017b). Draft guidance on preparing inventories of polychlorinated naphthalenes (PCNs). Draft March 2017. UNEP/POPS/COP.8/INF/19.
- Shaw SD, Blum A, Weber R, Kannan K, Rich D, Lucas D, Koshland CP, Dobraca D, Hanson S, Birnbaum LS. (2010). Halogenated Flame Retardants: Do the Fire Safety Benefits Justify the Risks? *Reviews on Environmental Health* 25(4) 261-305.
- SKNBS (Saint Kitts and Nevis Bureau of Standards). (2016). <https://www.sknbs.org> Accessed March 2017.
- Solid Waste Management Act. No. 11 of 2009. Saint Kitts and Nevis.
- Stapleton HM, Sjödin A, Jones RS, Niehüser S, Zhang Y, Patterson DG Jr. (2008). Serum levels of polybrominated diphenyl ethers (PBDEs) in foam recyclers and carpet installers working in the United States. *Environ Sci Technol*. 42(9), 3453-3458.
- Thureson K, Bergman K, Rothenbacher K, Herrmann T, Sjölin S, Hagmar L, Pöpke O, Jakobsson K. (2006). Polybrominated diphenyl ether exposure to electronics recycling workers--a follow up study. *Chemosphere*. 64(11), 1855-1861.

- UNECE (United Nations Environment Programme United Nations Economic Commission for Europe). (2007). http://www.unece.org/fileadmin/DAM/trade/agr/standard/standard/stand_e.htm
- UNEP (United Nations Environment Programme). (2010). Start up guidance for the 9 new POPs (general information, implication of listings, information sources and alternatives).
- UNEP (United Nations Environment Programme). (2013). Toolkit for Identification and Quantification Releases of Dioxins, Furans and Other Unintentional POPs. <http://toolkit.pops.int/>.
- UNEP (United Nations Environment Programme). (2014). Report of the PCB expert group on assessment of the production of use PCB and its alternatives for disease control: <http://chm.pops.int/Implementation/PesticidePOPs/DDT/DDTMeetings/PCBEG52014/tabid/4178/mctl/ViewDetails/EventModID/874/EventID/531/xmid/12802/Default.aspx> Accessed March 2017.
- UNEP (United Nations Environment Programme). (2017). World Bank, Interim Guidance for developing a National Implementation Plan for the Stockholm Convention.
- US-EPA (US Environmental Protection Agency). (2013). “Polybrominated Diphenyl Ethers (PBDEs) Significant New Use Rules (SNUR)”. www.epa.gov/assessing-and-managing-chemicals-under-tsca/polybrominated-diphenylethers-pbdes-significant-new-use.
- US-EPA (US Environmental Protection Agency). (2018). Persistent organic pollutants: A global issue, a global response. <https://www.epa.gov/international-cooperation/persistent-organic-pollutants-global-issue-global-response> Accessed February 2018.
- World Bank the population of Saint Kitts and Nevis for 2018. <https://data.worldbank.org/country/st-kitts-and-nevis?view=chart> Accessed February 2018.

ANNEXES

Documentation of disposal of Obsolete pesticides

WASTE ACCEPTANCE DOCUMENT

Site: SK Kitts & Nevis
Date: 8/20/2016

Document No: Page 1

Pallet Number	Packaging Type and No	Content	State	UN No	Gross Weight	Tare Weight	Net Weight	FAO Verification	Contractor Verification	Shipping Container #
1	6HA1 - MBT	Ioxynil	L	2903	251	21	230	GH	RS	CLHU 8385575
1	6HA1 - MBT	Ioxynil	L	2903	250	21	229	GH	RS	CLHU 8385575
1	6HA1 - MBT	Ioxynil	L	2903	156	21	135	GH	RS	CLHU 8385575
1	6HA1 - MBT	Phostreat	L	2902	238	21	217	GH	RS	CLHU 8385575
2	6HA1 - MBT	Ioxynil	L	2903	257	21	236	GH	RS	CLHU 8385575
2	6HA1 - MBT	Ioxynil	L	2903	242	21	221	GH	RS	CLHU 8385575
2	6HA1 - MBT	Ioxynil	L	2903	252	21	231	GH	RS	CLHU 8385575
2	6HA1 - MBT	Ioxynil	L	2903	252	21	231	GH	RS	CLHU 8385575
3	6HA1 - MBT	Ioxynil	L	2903	253	21	232	GH	RS	CLHU 8385575
3	6HA1 - MBT	Phostreat	L	2902	227	21	206	GH	RS	CLHU 8385575
3	6HA1 - MBT	Phostreat	L	2902	232	21	211	GH	RS	CLHU 8385575
3	6HA1 - MBT	Ioxynil	L	2903	257	21	236	GH	RS	CLHU 8385575
4	13H3 - FIBC	Empty Plastic Packaging	S	NDW	38	3	35	GH	RS	CLHU 8385575
5	6HA1 - MBT	Malathion	L	2902	235	21	214	GH	RS	CLHU 8385575
5	6HA1 - MBT	Malathion	L	2902	145	21	124	GH	RS	CLHU 8385575
5	6HA1 - MBT	Malathion/Caustic Soda	L	2902	230	21	209	GH	RS	CLHU 8385575
5	6HA1 - MBT	Malathion/Washwater	L	2902	133	21	112	GH	RS	CLHU 8385575
6	13H3 - FIBC	Empty Plastic Packaging	S	NDW	38	3	35	GH	RS	CLHU 8385575
7	13H3 - FIBC	Empty Plastic Packaging	S	NDW	38	3	35	GH	RS	CLHU 8385575
8	13H3 - FIBC	Empty Plastic Packaging	S	NDW	38	3	35	GH	RS	CLHU 8385575
9	6HA1 - MBT	Phostreat	L	2902	240	21	219	GH	RS	CLHU 8385575
9	6HA1 - MBT	Ioxynil	L	2903	247	21	226	GH	RS	CLHU 8385575
9	6HA1 - MBT	Ioxynil	L	2903	252	21	231	GH	RS	CLHU 8385575
9	6HA1 - MBT	Ioxynil	L	2903	252	21	231	GH	RS	CLHU 8385575
10	6HA1 - MBT	Proflcol	L	2902	226	21	205	GH	RS	CLHU 8385575
10	6HA1 - MBT	Proflcol	L	2902	234	21	213	GH	RS	CLHU 8385575
10	6HA1 - MBT	Polyoxyethylene Tallow Amine	L	2902	224	21	203	GH	RS	CLHU 8385575


Contractor Acceptance

Signature: 
Name (Block Letters): Ross J. Smith

State
L = Liquid
S = Solid

Packaging
OT = Open Top (1A2, 1H2)
CT = Closed Top (1A1, 1H1)
SD = Salvage Drum
FIBC
IBC
CB = Cupboard Box

Project Acceptance

Signature: 
Name (Block Letters): JUNE HUGHES

DEPARTMENT OF ENVIRONMENT