

PACIFIC POPS RELEASE REDUCTION PROJECT

Reducing Persistent Organic Pollutants (POPs) in the Pacific region through the improved management of solid and hazardous waste

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SPREP
Secretariat of the Pacific Regional
Environment Programme



uPOPs Prevention and Chemical Awareness: Considerations for Awareness-Raising Campaigns



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Stop the POPs!

Contents

Contents	1
1 Introduction.....	2
1.1 Target audience for the guideline	2
1.2 Objective	2
1.3 Content of the Guideline	2
2 Overview of uPOPs.....	3
2.1 What are POPs and uPOPs	3
2.2 Common sources of uPOPs in Pacific island countries.....	3
2.3 Routes of uPOPs releases.....	3
3 Key elements of effective awareness campaigns	5
3.1 Identify the issue and why a campaign is planned	5
3.2 Specify the purpose of the campaign.....	5
3.3 Identify the specific objectives of the campaign.....	5
3.4 Identify the target audience for the campaign	5
3.5 Identify the key messages.....	5
3.6 Determine the activities	5
3.7 Select the communication tools.....	6
3.8 Identify who will implement the campaign and the campaign partners	6
3.9 Determine how to measure the success of the campaign.....	7
4 Campaign examples.....	8
4.1 Campaign to promote composting – an alternative to open burning	8
4.2 Campaign for improved healthcare waste management	9
4.3 Campaign to promote waste reduction, reuse and recycling.....	10
4.4 Campaign to improve used oil management.....	11
4.5 Campaign to promote healthy vehicles	12
4.6 Campaign to reduce exposure to uPOPs from domestic cooking	13
4.7 Campaign to improve the management of chemicals	14
Appendix 1: List of resources.....	15

1 Introduction

1.1 Target audience for the guideline

The *uPOPs Prevention and Chemical Awareness: Considerations for Awareness-Raising Campaigns* (the Guideline) is aimed at national, provincial and local government institutions and other organisations which intend to implement campaigns to make people more aware of unintentionally produced Persistent Organic Pollutants (uPOPs) and the need to prevent them. The guideline includes measures to prevent and reduce uPOPs emissions, as well as to improve the management of chemicals. As uPOPs releases and chemicals cut across several sectors (e.g. agriculture, health, environment, transport), the Guideline has been written in general terms to allow it to be used for awareness campaigns across different sectors.

1.2 Objective

The main objective of the Guideline is to provide guidance and resources to create national and community-level awareness campaigns to inform and positively influence community attitudes, behaviours and beliefs around waste management, chemicals management, and other activities that contribute to the generation of uPOPs.

1.3 Content of the Guideline

Chapter 2 of the Guideline provides a very brief overview of the Stockholm Convention, and uPOPs. Chapter 3 describes key elements of an effective awareness-raising campaign, which should be considered when developing national and local awareness-raising campaigns. Examples of these key elements are illustrated in Chapter 4, which contains seven campaign briefs covering priority areas for uPOPs emissions reduction in Pacific island countries. These campaign briefs are by no means exhaustive in the issues or approaches they cover; rather, they are provided as examples of issues and approaches that could be covered in national or community-level awareness-raising campaigns.

2 Overview of uPOPs

2.1 What are POPs and uPOPs

Persistent organic pollutants (POPs) are a group of toxic chemicals that can travel long distances through air and water, and accumulate in the fatty tissues of humans and other animals. They do not degrade quickly over time, and as a consequence, potentially expose people to serious health issues including cancer, birth defects and immune system impairments.

Due to these concerns, POPs are regulated by the Stockholm Convention on POPs, a global multilateral environmental agreement that requires Parties to take action to eliminate or restrict the production, use and environmental release of POPs. The Stockholm Convention (www.pops.int) entered into force on 17th May 2004, and it currently regulates 28 POPs, which can be classified into two categories:

1. **Intentionally produced POPs**, are (or were previously) manufactured for a range of uses including as pesticides in agriculture, insecticides in disease control (for example DDT), flame retardant additives to electrical and electronic equipment and textiles, and electrically insulating and coolant fluids in electrical apparatus.
2. **Unintentionally produced POPs (uPOPs)**, are produced: as the result of thermal processes involving organic matter and chlorine; or as the by-products of manufacturing other chemicals. The uPOPs listed under the Stockholm Convention are:
 - Polychlorinated dibenzo-p-dioxins (dioxins)
 - Polychlorinated di-benzofurans (furans)
 - Hexachlorobenzene (HCB, also intentionally produced)
 - Hexachlorobutadiene (HCBd, also intentionally produced)
 - Pentachlorobenzene (PeCB, also intentionally produced)
 - Polychlorinated biphenyls (PCBs, also intentionally produced)
 - Polychlorinated naphthalenes (PCNs, also intentionally produced).

2.2 Common sources of uPOPs in Pacific island countries

- Waste incinerators, including for healthcare and quarantine wastes, and animal carcasses
- Production of ferrous and non-ferrous metals, including burning of copper cables to reclaim copper; and e-waste recycling
- Power generation using petroleum fuels and biomass, and domestic cooking with biomass (wood, coconut husks, etc)
- Cement kilns firing hazardous wastes (e.g. used lubricating oil), brick production, and asphalt mixing plants
- Transportation, including vehicles and vessels with 4-stroke, and 2-stroke engines, diesel engines, and heavy oil fired engines
- Biomass burning (e.g. field burning of agricultural residues), waste burning—including backyard burning and fires on landfills and dumpsites, and forest fires
- Drying of biomass (e.g. copra), crematoria, and tobacco smoking
- Production and use of chemicals including petroleum refining, and recycling of contaminated paper
- Landfills, waste dumps, landfill mining, sewage treatment, open water dumping, composting and used oil disposal – *these are routes of uPOPs releases rather than sources of uPOPs formation and release.*

2.3 Routes of uPOPs releases

Once formed, uPOPs may be released to several environmental media (air, water and land) and process outputs (products and residues) as summarised in Table 1. Awareness campaigns should not only address the sources of uPOPs formation (Section 2.2), but also the release routes described here. For example, an awareness campaign to reduce uPOPs in healthcare waste management should raise awareness of good segregation and incineration techniques that reduce formation of uPOPs; and also ash management and disposal practices to prevent further environmental releases of uPOPs that have formed.

Table 1: uPOPs release routes

Release group	Release route	Examples
Environmental media	Air	Atmospheric release of gases from dump fires and low-temperature combustion of healthcare waste
	Water (surface and ground water, including marine and estuarine water)	Discharge of wastewater containing POPs into rivers and oceans
	Land (surface soils)	Dumpsites POPs stockpile, burial, and previous application sites Land where burning activities (such as domestic cooking with wood) occurs
Process outputs	Products (such as chemical formulations, including pesticides or consumer goods such as paper, textiles, etc)	Stockpiles of DDT, pesticides, and other POPs
	Residues (including certain liquid wastes, sludge and solid residues, which are handled and disposed of as waste or may be recycled)	Sludge from sewage treatment (biosolids) Incinerator bottom ash and fly ash

Source: *Toolkit for identification and quantification of releases of dioxins, furans and other unintentional POPs under Article 5 of the Stockholm Convention, January 2013.* Available at <<http://toolkit.pops.int/>>.

3 Key elements of effective awareness campaigns

3.1 Identify the issue and why a campaign is planned

A key first step to a successful campaign is to identify the issue you want to address and the behaviours, attitudes or knowledge you want to change (see examples in Chapter 4). Be clear on why you are planning a uPOPs campaign. Why is the issue important? Why do people need to become aware of it? And why is a campaign the tool to achieve this goal?¹

To justify the need for the campaign, data should be used, where available, to illustrate the scale of the problem nationally and regionally. Useful data could include the amount of people affected by the issue, the level of public awareness around the issue, and the public health and environmental impacts surrounding the issue, would be useful in helping to establish the case for action.

3.2 Specify the purpose of the campaign

The overall purpose of the campaign should be connected to the issue being addressed and should describe in plain terms what you expect to achieve by the end of the campaign. For example, the purpose of a particular uPOPs campaign might be “to stop backyard burning in outer islands”.

3.3 Identify the specific objectives of the campaign

The specific objectives of the campaign are the lower level goals that must be met in order to achieve the purpose. Where possible, objectives should be SMART, i.e. they should be:¹

- **Specific** – Each objective should be clear and unambiguous, rather than general and vague.
- **Measurable** – Each objective should include some sort of indicator that will allow you to be able to measure progress.
- **Achievable** – It is important that each objective is realistic and attainable.
- **Relevant** – It is important to choose objectives that are relevant to the campaign.
- **Time-based** – It is important to have target dates for each objective to establish a sense of urgency.

3.4 Identify the target audience for the campaign

A target audience refers to the group of people whose behaviours, attitudes or knowledge you are trying to change with the campaign. The target audience must be decided at this stage of the process as they will influence the format of the campaign, the key messages and methods used, and the call to action (see section 3.7). Examples of target audiences for uPOPs awareness include policy makers, the general public, waste managers, and other government departments.

3.5 Identify the key messages

Key messages are the core points of information you want the target audiences to hear, understand and remember. They are used to help focus communication under the campaign. Key messages should be clear (free of jargon and technical language), concise, and consistent. Focus on three to five key messages per topic and write one to three sentences for each key message. As a guide, you should be able to read or speak the key messages in 30 seconds or less.² Examples of key campaign messages are provided in Chapter 4.

3.6 Determine the activities

Activities should be chosen that fit with the audience, support the key messages, and can be completed within the campaign budget and available human resource. It may be helpful to first brainstorm lots of activities and then select the

¹ European Literacy Policy Network (n.d.). *Guidelines to running an awareness raising campaign*, http://www.eli-net.eu/fileadmin/ELINET/Redaktion/Awareness_raising/Guideline_Running_a_campaign.pdf, accessed 26 March 2018.

² Model Systems Knowledge Translation Center (n.d.). *Developing key messages for effective communication*, http://www.msktc.org/lib/docs/KT_Toolkit/Key_Message_Development_508.pdf, accessed 26 March 2018.

best ones that will help you to achieve the campaign objectives and purpose. Examples of campaign activities are provided in Chapter 4.

3.7 Select the communication tools

Communication tools help you to get your message across to the target audience. Some tools may be more effective at reaching some audiences compared to others. Key communications tools to consider are summarised in Table 2.

Table 2: General communication tools

Communication tool	Description
Brochures	These can be used to promote the campaign in general, or specific activities
Community meetings	Communal gatherings are interactive and provide a feedback loop to improve the campaign
Advertising	Includes billboards, posters, stickers, banners, newspaper ads/comics, and radio/TV ads
Events	Includes workshops, 'day of action', fun walks, etc
Instructional demonstrations	Provision of practical 'how-to' instruction to the target audience
Games, quizzes, contests	Interactive method of engaging with the target audience to get the message across
Information or fact sheets	Includes how-to guidelines and similar materials that provide guidance and information
Person-to-person	Word of mouth is an effective form of awareness raising
Presentations	Campaign presentation at meetings, service clubs (e.g. Rotary and Lions Clubs), and other forums
Public service announcement	A brief announcement on local media of facts (who, what, where, when, why) about the campaign
News release	An article sent to media to prompt stories or highlight events
Social media/networking	Using Facebook, twitter, YouTube, etc to engage with the target audience
Videos	Includes animated stories and documentaries
Websites	Campaign information and resources posted online and linked to popular websites

3.8 Identify who will implement the campaign and the campaign partners

As uPOPs are released from sources that are under the responsibility of different departments (e.g. waste, agriculture, health, and transport), it could be more effective to organise a joint campaign between two (or more) organisations. Potential partners include: other government departments; non-governmental, civil society, and faith-based organisations which have already established strong community links and complementary programs; businesses, and media partners such as the local newspaper or radio station. It could also be beneficial to partner with local celebrity and/or community ambassadors to help promote the campaign. These ambassadors should be widely-respected persons with some influence over the target audience. Potential ambassadors could include local sports stars, radio personalities, or community leaders. A summary of potential campaign partners is provided in Table 3.

Table 3: General communication tools

Source of uPOPs	Potential partners
Waste incineration	Ministry of Health for healthcare waste incineration Ministry of Agriculture (Quarantine or Biosecurity) for quarantine waste incineration Leaders of communities potentially affected by incinerators
Burning of wires and e-waste recycling to reclaim metals	Department of Labour Landfill/dumpsite operators; Waste management and recycling companies NGOs, CSOs and FBOs that work with marginalised and vulnerable populations
Power generation	Electricity producers, energy companies
Domestic cooking with biomass	Ministry responsible for internal or rural affairs Ministry of Forestry (e.g. if biomass used for cooking is contributing to deforestation) Cook stove and fuel suppliers Traditional community leaders NGOs, CSOs and FBOs that work with the targeted communities
Cement kilns fining hazardous wastes	Department of Labour Cement manufacturers Waste management and recycling companies Chamber of Industry and Commerce

Source of uPOPs	Potential partners
Vehicles and vessels burning fossil fuels in engines	Ministry of Transport and Shipping; Land Transport Authorities Ministry of Health Industry associations (e.g. Taxi Associations, Motor Vehicle Associations)
Biomass burning (e.g. pre-harvest burning of sugar cane fields)	Ministry of Agriculture Farmers Associations NGOs, CSOs and FBOs involved in agriculture
Waste burning (backyard burning, dump/landfill fires)	Public Health Department Ministry responsible for internal or rural affairs Landfill/dumpsite operators; Waste management and recycling companies, NGOs, CSOs and FBOs that work with the targeted communities
Accidental fires (e.g. houses, factories, vehicles)	Fire Department Landfill/dumpsite operator & Waste management and recycling companies (transporters and recipients of the burnt material) Property/vehicle insurance companies
Forest fires	Ministry of Forestry Ministry of Agriculture (e.g. forest fires caused by slash and burn practices) Farmers Associations
Drying of biomass (e.g. copra)	Ministry of Agriculture Farmers Associations
Crematoria	Crematorium operators
Tobacco smoking	Ministry of Health Tobacco importers and retailers
Production and use of chemicals including petroleum refining and recycling of contaminated paper	Ministry of Labour (occupational health and safety issues) Chemical producers Waste management and recycling companies Chamber of Industry and Commerce
Landfills, waste dumps, landfill mining, sewage treatment, open water dumping, composting and used oil disposal	Ministry of Health Ministry of Agriculture Operators of relevant facilities (landfills, sewage treatment plants, etc) Lubricant oil importers Waste management and recycling companies

3.9 Determine how to measure the success of the campaign

It's import to define the awareness activities measures for success from the outset. Success can be measured at several levels:

- Activity level – measures at this level report 'what' and 'how much' have been produced by the campaign activities (e.g. 500 how-to-compost brochures disseminated, 100 persons shown how to compost, etc)
- Outcome level - measures at this level reflect the changes that happen because of the campaign (e.g. 20 households practicing backyard composting)
- Impact level –measures at this level describe the ultimate effect after the campaign aim or purpose is achieved (e.g. zero uPOPs emissions from waste burning). The impact of a campaign can be difficult to measure, as there may be other factors at play. That is, the impact observed now could also be the result of previous projects, or activities conducted by other people or groups that are not associated with the campaign.

It is recommended to incorporate the three levels of success measures into national campaigns. As activity level measures or indicators (e.g. 500 posters disseminated) are easily derived from the corresponding activities (e.g. 'disseminate posters'), the campaign briefs in the next section, focus only on examples of outcome and impact level indicators.

4 Campaign examples

4.1 Campaign to promote composting – an alternative to open burning

What behaviours or practices need to be changed?	<p>People may burn their waste for any number of reasons including because of lack of access to a waste collection service and/or disposal site; to avoid attracting pests, or simply because they've always done it.</p> <p>Burning of food scraps and garden wastes (and other wastes) in an open fire or an outdoor container produces smoke which can contain dioxins, furans, other uPOPs, and fine particles. Inhaling this smoke over time can cause the dioxins and furans to build up in the bodies of humans and animals, leading to cancer, damage to the immune system, and reproductive problems. Dioxins and furans can be passed on from mother to babies and infants through human milk.</p>
What is the alternative?	<p>Food scraps and garden waste can be composted. Composting is the natural biological decomposition of organic waste such as food or plant material by bacteria, fungi, worms and other organisms under aerobic (occurring in the presence of oxygen) conditions. The result of composting is an accumulation of partially decayed organic matter called compost. Compost is useful – it nourishes our soil, and helps plants grow.</p>
Campaign purpose	To reduce the practice of open burning of waste
Specific objectives	<ol style="list-style-type: none"> To raise awareness of the dangers of open burning To promote composting of organic waste To encourage waste reduction, reuse, and recycling
Target audience	Schools, households, communities, restaurants, local councils, gardeners, farmers
Key messages	<ul style="list-style-type: none"> Burning waste produces toxic smoke that pollutes the air and can make you and your family sick. You burn it, you'll breathe it. Composting kitchen scraps and garden waste is an easy and natural process that produces compost that can be used to produce healthier fruits and vegetables with less chemicals Reduce, reuse, and recycle your waste
Campaign activities	<p>Conduct door-to-door information sessions on the negative impacts of open burning</p> <ul style="list-style-type: none"> Conduct community workshops to demonstrate backyard composting Prepare and disseminate a how-to guideline on various composting methods Provide subsidies on composting bins <ul style="list-style-type: none"> Conduct a recycling bin design/decoration competition (compost bins as prizes) Prepare and disseminate factsheets on waste reduction and reuse tips Encourage recycling companies to establish community recycling bins
Implementing entity	<ul style="list-style-type: none"> Department of Environment / Waste Management Agency
Partners	<ul style="list-style-type: none"> Waste management unit/department/agency International and domestic non-governmental organisations, community-based organisations, and faith-based organisations Community waste champions Recycling companies
Measures of success	<p><i>Outcome:</i></p> <ul style="list-style-type: none"> Reduction of households in xxx (e.g. specific villages) practicing backyard burning Increase in households in xxx (e.g. specific villages) practicing composting
	<p><i>Impact:</i></p> <ul style="list-style-type: none"> Total annual uPOPs emissions from waste burning reduced
Resources	See Appendix 1

4.2 Campaign for improved healthcare waste management

What behaviours or practices need to be changed?	<p>Healthcare waste (HCW) refers to waste generated from provision of health care. A majority of HCW (about 75-90%) is general waste, which includes paper, plastic packaging, waste food, and other wastes that have not been in contact with patients. A smaller fraction (10-25%) is infectious and/or hazardous waste (e.g. hypodermic needles, blood, chemicals, pharmaceuticals, medical devices and radioactive materials) that require special handling, treatment and disposal. Human exposure to infectious HCW can result in injury and infections such as human immunodeficiency virus (HIV), and hepatitis viruses B and C.</p> <p>When infectious/hazardous HCW is not being managed in an environmentally sound manner, it poses occupational and public health risks to patients, healthcare workers, waste handlers and transporters, and communities. Improper management practices have also introduced harmful substances including pharmaceuticals, chemicals, and heavy metals into the environment. The by-products of HCW incineration include dioxins, furans, particulate matter, and heavy metals.</p>
What is the alternative?	<p>Establish national HCW guidelines to guide all healthcare facilities on what should and should not be classified as infectious/hazardous HCW; and on the appropriate management of specific waste streams (e.g. pharmaceuticals, chemicals, and infectious waste).</p> <p>A program for environmentally sound management of HCW based on best available techniques (BAT) and best environmental practices (BEP), should be implemented and enforced. This program should, at a minimum, focus on three key elements: waste reduction at source, waste segregation, and waste incineration.</p>
Campaign purpose	To increase awareness of environmentally sound management of HCW
Specific objectives	<ol style="list-style-type: none"> 1. To reduce the amount of HCW generated 2. To improve HCW segregation practices in healthcare facilities 3. To improve the safe treatment and disposal of infectious/hazardous HCW
Target audience	Orderlies, nurses, incinerator operators, health inspectors, procurement staff, hospital administrators
Key messages	<ul style="list-style-type: none"> ▪ Buy the right products at the right time and use them before expiry ▪ Segregating HCW into the right bin is safer for staff, patients and the general public; results in less infectious and hazardous waste to manage; and saves the hospital money ▪ Treat and dispose of HCW in accordance with established guidelines
Campaign activities	<ul style="list-style-type: none"> ▪ Create a hospital 'Green Team' to help the hospital improve HCW management ▪ Develop and implement a sustainable procurement plan for healthcare commodities ▪ Establish a training program to provide HCW segregation training to nursing and housekeeping staff at regular intervals (e.g. quarterly) ▪ Prepare instructional posters on HCW segregation and post them at segregation points ▪ Establish a training program to provide relevant hospital staff with training on HCW handling, storage, treatment and disposal at regular intervals ▪ Establish national (or adopt international) guidelines on HCW treatment and disposal
Implementing entity	Department of Health
Partners	HCW management contractors, nursing schools
Measures of success	<p><i>Outcome:</i></p> <ul style="list-style-type: none"> ▪ Reduction in HCW generated ▪ HCW incinerated to national guidelines <p><i>Impact:</i></p> <ul style="list-style-type: none"> ▪ Quantity of uPOPs emissions from HCW incineration decreased
Resources	See Appendix 1

4.3 Campaign to promote waste reduction, reuse and recycling

What behaviours or practices need to be changed?	Most of the 'waste' we produce is really a valuable resource that can be reused, recycled or composted, such as paper, cardboard, metals, and glass, food scraps, and garden clippings. However, much of this resource is currently not separated from other waste and is instead buried in landfills or open dumpsites where they are wasted and take up lots of space. This is a particular problem for smaller Pacific countries with limited financial resources because land space is limited and constructing and operating new landfills is expensive. When this waste is burnt in fires at landfills and dumpsites, it generates thick black smoke which contains dioxins, furans, and other toxic compounds.	
What is the alternative?	Separating and reusing, recycling materials from the waste stream saves space at local landfills and dumpsites and creates a potential source of income that can be used to subsidize the overall operation of the waste management system. Before promoting the separation of a specific waste stream (e.g. glass), it is important to ensure there is a viable opportunity to reuse, recycle or compost the stream to prevent it ending up in a landfill or dump (e.g. crush the glass and reuse as an aggregate in concrete)	
Campaign purpose	To increase waste reduction, reuse and recycling (the 3Rs)	
Specific objectives	1. To encourage and support waste reduction initiatives 2. To promote opportunities to reuse and recycle waste	
Target audience	Households, communities, businesses, government offices, schools, waste and recycling companies	
Key messages	<ul style="list-style-type: none"> ▪ Don't waste our islands — reduce, reuse and recycle ▪ Put the right waste in the right bin ▪ Reducing, reusing and recycling waste keeps waste out of landfills and delays the need for new landfills ▪ Burying some types of materials in landfills and dumpsites is a waste of money 	
Campaign activities	<ul style="list-style-type: none"> ▪ Door-to-door informational sessions with households/businesses on the 3Rs ▪ Establish annual eco-award for businesses that do well in the 3Rs ▪ Develop and disseminate a 3R guide for businesses, and 3R factsheet for households ▪ Develop and promote a list of 'green products' to encourage purchasing of products that have minimal waste impacts <ul style="list-style-type: none"> ▪ Conduct 'green purchasing' workshops with businesses to promote the use of recycled and recyclable products with recycled and recyclable packaging ▪ Advertise arrangements for recycling collection/drop-off ▪ Promote waste segregation at public events such as sporting and cultural events ▪ Conduct competitions to design recycling logos/mascots ▪ Establish an online marketplace to facilitate sale/exchange of used goods ▪ Host 'swap-meets' or 'swap/shops' to facilitate sale/exchange of used goods 	
Implementing entity	Department of Environment / Waste management Agency	
Partners	Waste and recycling companies, NGOs, faith-based organisations, service clubs, Chamber of Industry and Commerce, small business association	
Measures of success	<i>Outcome:</i>	<ul style="list-style-type: none"> ▪ Increased quantity of used goods/material sold or exchanged through marketplace or swap meets ▪ Eco-award established and businesses actively nominating their activities for award ▪ Green product list widely available and informing consumers
	<i>Impact:</i>	<ul style="list-style-type: none"> ▪ Increase in volume of [material 1], material [2], [etc] recycled ▪ Decrease in amount of waste received at landfill each month ▪ Decreased open burning
Resources	See Appendix 1	

4.4 Campaign to improve used oil management

What behaviours or practices need to be changed?	<p>Lubricating and hydraulic oils are essential for the proper functioning of vehicle engines, generators, and other machines. Some of this oil is consumed or dissipated during use. Once the remaining oil becomes too dirty to function as intended, it is replaced with new oil, and the used oil is often discarded on the ground, in drains, or stored in drums and containers that eventually disintegrate and leak used oil into the environment. In some cases, used oil is also inappropriately used as a dust suppressant on roads, to protect wood from termites, as a weed killer, and for line marking of sports fields. Open burning of used oil (e.g. on landfills and dumps) also creates dioxins and furans.</p> <p>If used oil and the contaminant it contains are disposed of inappropriately and released into the environment, they can harm humans, plants, animals, fish and shellfish.³</p>
What is the alternative?	<p>Used oil can be cleaned and re-refined into new oil that is used again. Used oil can also be combusted as a fuel in high-temperature industrial processes, including in the steel and cement manufacturing industries. Used oil should be collected and temporarily stored in an environmentally safe manner until it can be exported to re-refineries to make new oil or to appropriate industries to be used as fuel. Establishing an oil product stewardship scheme in which a recycling levy is charged on every litre of new oil imported, would provide the revenue to fund the collection and export arrangements.</p>
Campaign purpose	To improve the environmentally sound management of used oil
Specific objectives	<ol style="list-style-type: none"> To raise awareness of the dangers of used oil To promote options for safe used oil management
Target audience	Vehicle repair shops, businesses that operate machinery and/or conduct in-house vehicle maintenance, do-it-yourself vehicle owners
Key messages	<ul style="list-style-type: none"> It takes one litre of oil to contaminate one million litres of water Do not pour used oil down drains, septic tanks, wells or onto the ground, it will contaminate our food and water Collect used oil in a leak-proof can or container, taking care not to spill any when removing it from your vehicle or equipment <i>Add a positive message of what specifically should be done with used oil in the country</i>
Campaign activities	<ul style="list-style-type: none"> Conduct one-on-one informational sessions with businesses on used oil management Develop and distribute instructional leaflets/posters for do-it-yourselfers Develop and promote animated series on used oil management (using local artists) Develop and promote a voluntary industry code of practice for used oil management Provide awards for vehicle repair shops that manage used oil in accordance with the code Conduct informational workshops with relevant government officials and industry to promote the establishment of an oil product stewardship scheme
Implementing entity	Department of Environment / Waste Management Agency
Partners	Oil importers, industry associations, Chamber of Commerce and Industry
Measures of success	<p><i>Outcome:</i></p> <ul style="list-style-type: none"> Increased number of businesses adopting used oil management best practices Decreased instances of used oil being released into the environment
	<p><i>Impact:</i></p> <ul style="list-style-type: none"> Reduced uPOPs production through burning of waste oil Reduced quantities of total petroleum hydrocarbons in water at agreed monitoring points
Resources	See Appendix 1

³ <http://www.environment.gov.au/protection/publications/factsheet-why-we-should-recycle-used-motor-oil>

4.5 Campaign to promote healthy vehicles

What behaviours or practices need to be changed?	<p>The process of burning petrol, diesel and other fuels to power motor vehicles emits a variety of air pollutants into the environment. These air pollutants include particulate matter, nitrogen oxides, sulphur dioxides, carbon monoxide, and uPOPs (dioxins and furans). Exposure to these pollutants have been linked to birth defects, cancer and other serious illnesses.</p> <p>Poorly maintained vehicles emit more air pollutants. Black smoke emanating from vehicles is an indication that the vehicle is wasting fuel and engine damage is probably occurring.</p>	
What is the alternative?	Routine vehicle servicing eliminates many problems that cause smoke emissions and saves the vehicle owner time and money. Limiting the age of vehicles that can be imported and requiring vehicles to be fitted with emission control devices, contributes to reductions in vehicle emissions.	
Campaign purpose	To promote healthy vehicles	
Specific objectives	To raise awareness of vehicle emissions and how to reduce them	
Target audience	All vehicle owners	
Key messages	<ul style="list-style-type: none"> Take good care of your vehicle to reduce air pollutants 	
Campaign activities	<ul style="list-style-type: none"> Conduct poster/slogan design competitions to promote healthy vehicles Place posters/signage on busy roads and intersections Disseminate posters/flyers on benefits of good vehicle maintenance to reduce emissions. Flyers should be strategically disseminated at Customs, car dealerships, service workshops, and vehicle licensing/registration offices Conduct an enforcement drive to crack down on smoky vehicles (If this is an offence under the local laws) Prepare and disseminate factsheets comparing fuel economy and operating costs of common vehicle brands Advocate internally for a maximum age restriction on imported vehicles, and for imported vehicles to be fitted with mandatory emission control systems 	
Implementing entity	Department responsible for transportation and vehicle licensing	
Partners	Motor vehicle workshops, vehicle insurance companies, car dealerships	
Measures of success	<i>Outcome:</i>	<ul style="list-style-type: none"> Increased number of vehicles serviced
	<i>Impact:</i>	<ul style="list-style-type: none"> Total annual quantity of uPOPs emitted from motor vehicles reduced
Resources	See Appendix 1	

4.6 Campaign to reduce exposure to uPOPs from domestic cooking

What behaviours or practices need to be changed?	<p>Cooking with biomass in residential households is a widespread practice in many Pacific countries, particularly in rural areas. Cooking may take place in open fire pits, earth ovens, and wood-burning stoves and ovens, using wood harvested from forests mangroves, driftwood, treated wood, coconut shells/husks and other biomass. Dioxins and furans are formed because of the incomplete combustion of the biomass using these cooking methods as well as from the use of salt laden biomass (e.g. mangrove wood, drift wood), and treated wood.⁴</p> <p>The World Health Organization estimated that as at 2000, the indoor smoke from combustion of biomass was responsible for 2.9% (1.6 million) of all deaths globally; 59% of the deaths from indoor smoke were women, while 56% of the deaths were children under 4 years old.⁵</p>
What is the alternative?	<p>The health and environmental impacts of domestic cooking can be reduced by shifting away from biomass stoves and towards cleaner options such as liquified petroleum gas (LPG), electric stoves or methane stoves (based on a biogas digester). Where making this shift is too costly, the use of well-designed biomass stoves with dry, well-seasoned biomass, and avoiding the use of salt laden or contaminated wood would be an improvement.⁴</p> <p>It is important to note that in instances where open fires are valued for other purposes such as providing a gathering point for communal events, biomass drying, and repelling insects, it will be difficult to get public buy in for alternatives that do not provide equivalent benefits.</p>
Campaign purpose	To reduce the adverse health and environmental impacts of domestic cooking
Specific objectives	<ol style="list-style-type: none"> To reduce human exposure to uPOPs from domestic cooking To encourage the adoption of improved cooking appliances
Target audience	Households and communities that rely on cooking with biomass; women and children who spend the most time around fires
Key messages	<ul style="list-style-type: none"> Inhaling smoke while cooking will make the family (especially women and children) sick Efficient stoves produce less harmful smoke, cook faster, use less wood, and save money Efficient stoves use less wood and help to preserve the forests and mangroves
Campaign activities	<ul style="list-style-type: none"> Conduct community meetings on the health effects of smoke inhalation and measures to reduce indoor smoke Provide awareness training to extension workers in health, agriculture and forestry, to help with long-term promotion of best practices in rural/remote communities Disseminate list of improved cooking appliances available locally Offer incentives to encourage trade-in of inefficient stoves for improved stoves Conduct community demonstrations on construction and operation of improved stoves Conduct a small-scale biogas digester pilot project to demonstrate the production and use of biogas from sewage and animal wastes Conduct poster design competitions (prize to include improved cooking appliances)
Implementing entity	Department of Health, Department responsible for rural/internal affairs
Partners	NGOs that work with women; stove suppliers, Department of Agriculture and Forestry
Measures of success	<p><i>Outcome:</i></p> <ul style="list-style-type: none"> Increased number of households switching to improved cooking appliances and adopting improved cooking practices Decreased human exposure to uPOPs through domestic cooking
	<p><i>Impact:</i></p> <ul style="list-style-type: none"> Reduction in uPOPs emissions from cooking with biomass
Resources	See Appendix 1

⁴ UNEP 2008, Guidelines on best available techniques and provisional guidance on best environmental practices relevant to Article 5 and Annex C of the Stockholm Convention on Persistent Organic Pollutants, Geneva, Switzerland: UNEP, p94.

⁵ WHO (2004). *The world health report 2002: Reducing risks, promoting healthy life*. Geneva: WHO, pp226.

4.7 Campaign to improve the management of chemicals

What behaviours or practices need to be changed?	<p>Chemicals have been widely used in many sectors including in agriculture (e.g. pesticides), and in school laboratories for teaching purposes. In agriculture, sites where dioxin-containing pesticides have been applied may also be sources of uPOPs releases. Safe management of these chemicals and associated stockpiles, wastes, and potentially contaminated sites requires access to information, and an appreciation of the adverse effects of chemicals on human health and the environment.</p> <p>Many countries currently lack a robust risk assessment process to guide the purchasing and usage of new chemicals. Most chemicals are imported without regard for their health and environmental impacts, and without considering whether less toxic alternatives are available. Once procured, most chemicals are not appropriately managed; they may be stored inappropriately with other incompatible and reactive chemicals, and unwanted chemicals may be discarded in drains or with general waste. Occupational health and safety standards for those working with chemicals may also be lacking or weakly enforced.</p>
What is the alternative?	Everyone involved in the management of chemicals (from importation through to use and disposal) should understand the human health and environmental risks of the chemicals they are working with and the consequences of mismanagement. They should be given the training (appropriate to their responsibilities) and tools (including personal protective equipment) to implement sound chemical management practices.
Campaign purpose	To improve awareness of practices for the sound management of chemicals
Specific objectives	<ol style="list-style-type: none"> To raise awareness of sound management practices for agricultural chemicals To raise awareness of sound management practices for school laboratory chemicals
Target audience	<p>For agricultural chemicals: Farmers, farm workers, and pesticide distributors</p> <p>For laboratory chemicals: School principals, chemistry teachers, students</p>
Key messages	<ul style="list-style-type: none"> Store chemicals securely to minimise impacts to human health and the environment Use appropriate personal protective equipment (PPE) when working with chemicals
Campaign activities	<ul style="list-style-type: none"> Promote implementation of the International Code of Conduct on Pesticide Management⁶ Prepare and disseminate training videos and ads on agricultural chemicals management Conduct enforcement drives for safe chemicals management (e.g. proper storage, PPE usage) Establish a Good Practice Award for farms and companies implementing good practices Promote organic farming practices <ul style="list-style-type: none"> Develop and disseminate laboratory chemical management booklets/videos for schools (covering inventory, storage, usage, and disposal of wastes and unwanted chemicals) Conduct poster design competitions on safe usage, storage and disposal of chemicals Incorporate appropriate aspects of chemicals management into the curriculum at schools and teachers' training colleges
Implementing entity	Department of Agriculture, Department of Education (for lab chemicals)
Partners	Department of Environment, Farmers' Associations, Schools, chemical suppliers
Measures of success	<p><i>Outcome:</i></p> <ul style="list-style-type: none"> Number of farms and businesses engaging in sound management practices for agricultural chemicals Number of schools that adopt sound management practices for school laboratory chemicals
	<p><i>Impact:</i></p> <ul style="list-style-type: none"> Quantity of unwanted chemicals in storage
Resources	See Appendix 1

⁶ http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/Code/CODE_2014Sep_ENG.pdf

Appendix 1: List of resources

Stop the POPs

- General POPs information: <https://www.sprep.org/gefpaspops/home>
- Stop the POPs animation video : <https://www.youtube.com/watch?reload=9&v=GmOZdhvhPTw&feature=youtu.be>

Composting

- Rubbish is a Resource!: https://www.sprep.org/att/publication/000496_WasteKitBookLR.pdf
- Smart Choices for a Cleaner and Safer Pacific poster: http://www.sprep.org/attachments/pacwaste/A4_Poster_RGB.jpg
- Easy Composting Guideline: <http://www.environment.nsw.gov.au/resources/communities/languageresources/110742-Composting-English.pdf>
- Composting at home: <https://www.epa.gov/recycle/composting-home>
- Banana Circles: <https://permaculturenews.org/2014/04/08/banana-circles/>

Healthcare waste management

- Safe HCW management: https://www.healthcare-waste.org/fileadmin/user_upload/resources/Safe-Management-of-Wastes-from-Health-Care-Activities-2.pdf
- HCW management training: http://www.who.int/water_sanitation_health/facilities/waste/training_modules_waste_management/en/
- Reducing PVC use in hospitals: https://noharm-uscanada.org/sites/default/files/documents-files/114/Reducing_PVC_in_Hosp.pdf
- Mercury free medicine guidelines: <https://practicegreenhealth.org/pubs/mercfree.pdf>
- Purchasing and inventory control: <https://secure.jdeducation.com/JDCourseMaterial/FundPurch.pdf>
- Green team explained: <https://practicegreenhealth.org/pubs/toolkit/greenteam/CreatingEffectiveGreenTeams.pdf>

Domestic waste segregation and recycling

- Rubbish is a Resource! (Chapter 1): https://www.sprep.org/att/publication/000496_WasteKitBookLR.pdf
- Pacific Waste Education Handbook (Unit 6): https://www.sprep.org/attachments/Publications/Pacific_Waste_Education_Handbook_2012_Web.pdf
- Decision maker's Guide to Solid Waste Management (Chapter 6): <http://www.bvsde.paho.org/bvsars/i/fulltext/decision/decision.pdf>

Used oil management

- Health & environmental impacts of used oil: http://www.ruralresidentialliving.com.au/waste_management/resource_downloads/Used%20oil%20-%20health%20and%20environmental%20impacts.pdf
- Used oil re-refining & reuse: www.basel.int/Portals/4/Basel%20Convention/docs/meetings/sbc/workdoc/old%20docs/tech-r9.pdf
- Used oil management: <http://wedocs.unep.org/handle/20.500.11822/7760>
- Code of practice for workshops: <https://www.ehp.qld.gov.au/assets/documents/regulation/pr-cp-motor-vehicle-workshop.pdf>

Vehicle emissions

- Vehicle emissions posters: <http://summitcountyhealth.org/environmental-health/emissions-awareness-program/>
- Causes of smoky vehicles: <https://www.epa.nsw.gov.au/your-environment/air/reducing-motor-vehicle-emissions/causes-smoky-vehicles>

Domestic cooking with biomass

- List of publications on stoves: http://journeytoforever.org/at_woodfire.html#Improvedstoves
- Design principles for wood burning cook stoves: <http://www.pciaonline.org/files/Design-Principles-English-June-28.pdf>
- Stockholm Convention BAT/BEP Guideline (Part III Source Category (c): Residential combustion sources): <http://chm.pops.int/Implementation/BATandBEP/BATBEPGuidelinesArticle5/tabid/187/Default.aspx>
- General resources on biomass cook stoves and a discussion forum: <http://stoves.bioenergylists.org/about>
- General information on various stove types: <http://cleancookstoves.org/technology-and-fuels/stoves/index.html>
- How to make, use and enjoy solar cookers: <http://www.solarcooking.org/plans/Plans.pdf>
- Biodigester installation manual: <http://www.fao.org/ag/aga/agap/frg/recycle/biodig/manual.htm>
- VACVINA biogas plant information and construction video: <https://paksc.org/pk/biogas-plant-design/1014-vacvina-biogas-model-construction-video/>
- Biogas basics, including socio-cultural aspects: <http://www.biyogazder.org/makaleler/mak07.pdf>

Chemicals management

- Understanding pesticide labels: <https://store.extension.iastate.edu/Product/5696>
- Impacts of pesticide use in developing countries: <http://collections.infocollections.org/ukedu/en/d/Jid22ie/3.3.html>
- Management of small quantities of unwanted and obsolete pesticides: http://www.fao.org/fileadmin/user_upload/obsolete_pesticides/docs/small_qties.pdf
- Code of conduct and guidelines on the distribution and use of pesticides: <http://www.fao.org/docrep/005/y4544e/y4544e00.htm>
- Agricultural pesticide personal protective equipment: https://dspace.library.colostate.edu/bitstream/handle/10217/182442/AEXT_050212015.pdf?sequence=11
- School chemistry laboratory safety guide: <https://www.cdc.gov/niosh/docs/2007-107/pdfs/2007-107.pdf>
- Green chemistry overview: <https://www.epa.gov/greenchemistry>
- Chemicals storage guide: https://ehs.stonybrook.edu/resources/_documents/Chemical%20Storage%20Guide.pdf