State Of Environment

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Inform project manager

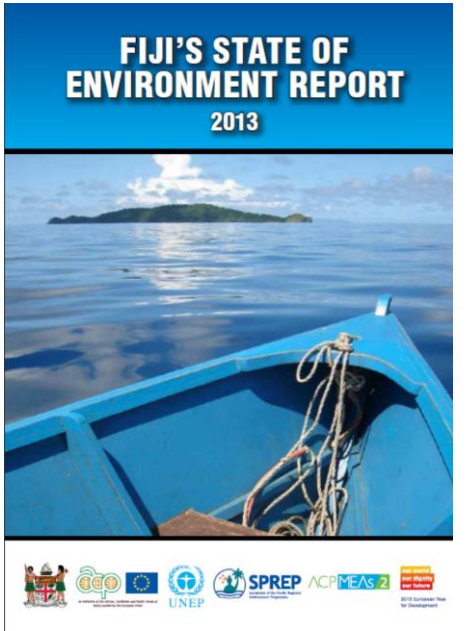
SOE - Context

- Round of regional SOEs done in early 1990s
- Some countries have continued the process over the past 25 years. Others.. Not

ENVIRONMENTAL INFORMATION FOR DECISION MAKING

Current SOE status in the Pacific

- Current in the last 5 years- Samoa, Fiji, Cooks, Niue, RMI.. Palau
- In progress- FSM, Solomon Islands, Tonga
- Planned early 2019 – PNG, Kiribati, Samoa, Fiji
- Planned- Vanuatu, Tuvalu, Nauru



7 Thematic Areas

NO	THEMATIC CONTENT	THEMATIC LEAD
1	Atmosphere and Climate	Office of the Environmental Planning and Policy Coordination (OEPPC) and Environmental Protection Authority (EPA)
2	Land	Ministry of Resources and Development (MRD)
3	Marine (Inshore and offshore)	Marshall Islands Marine Resources Authority (MIMRA)
4	Biodiversity	Office of the Environmental Planning and Policy Coordination (OEPPC) and Environmental Protection Authority (EPA)
5	Culture and Heritage	Ministry of Internal Affairs
6	Built Environment	Ministry of Resources and Development (MRD) Ministry of Public Works (MOPW) Marshalls Energy Company (MEC) Majuro Water and Sewer Company (MWSC) Majuro Atoll Waste Company (MAWC)
7	Nuclear Legacy	Ministry of Foreign Affairs The 4 Atolls local governments

Theme 1: Atmosphere and Climate

ATMOSPHERE AND CLIMATE – OZONE DEPLETING SUBSTANCES

Stratospheric ozone is naturally generated at high altitudes (15–50km) above the earth's atmosphere and has a role to play in the global effort to combat climate change. RMI became a Party to the 1995 Vienna Convention on the Protection of the Ozone Layer, the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer and the 1990 London Amendment, on 11 March 1993. It became a party to the 1992 Copenhagen Amendment on 24 May 1993. Accordingly, it is required to control the consumption of chlorofluorocarbons (CFCs), halons, methyl chloroform (1,1,1-trichloroethane), carbon tetrachloride, hydrochlorofluorocarbons (HCFCs), hydrobromofluorocarbons (HBFCs), "other halogenated CFCs" and methyl bromide at this time.

RMI is not a party to the 1997 Montreal Amendment or the 1999 Beijing Amendment to the Montreal Protocol. It is considering ratification of these amendments and is classified as operating under Article 5 of the Montreal Protocol – as such it is entitled to assistance from the Multilateral Fund to comply with its obligations (RMI ODS action plan).

Status: Good Trend: Improving Data Confidence: Medium

Only three types of ozone depleting substances are known to have been imported into RMI in bulk form: (CFCs) and (HCFCs) which are used for refrigeration and air-conditioning, and methyl bromide used for quarantine fumigation. Other than the use of methyl bromide for fumigation, consumption of ODS in RMI is exclusively in the refrigeration and air conditioning sector.

According to the data submitted to the Ozone Secretariat, RMI must freeze its consumption of CFCs at 1.16 ODP tonnes from 1 July 1999. According to the same data, by 2000 RMI had reduced imports of CFCs to 0.53 ODP tonnes (Figure 48). It is therefore in full compliance with its obligations (RMI ODS action plan). As of 2004, RMI has banned CFCs and has committed to phasing out HCFCs by 2030 as part of the Montreal and Vienna protocols (Ozone Layer Regulation 2004) (Figure 49 and 50).

FIGURE 48. Marshall Islands ODS consumption (UNEP Data Center).

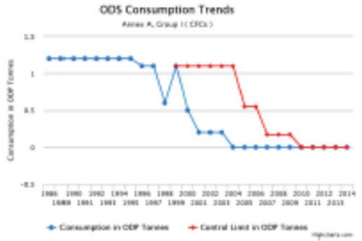


FIGURE 49. Marshall Islands CFCs consumption (UNEP Data Center).

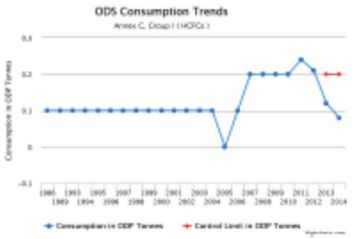


FIGURE 50. Marshall Islands HCFCs consumption (UNEP Data Center).

Theme 2: Land

AGRICULTURE: LAND UNDER CULTIVATION

Agriculture is an essential part of the RMI culture and economy, particularly around crops such as taro, coconut, banana, pandanus and papaya, and livestock such as pig, chickens and ducks. Goats were recently introduced. As the total area under cultivation is unknown, an agriculture census needs to be carried out to set a baseline and also to identify all areas under cultivation. Figure 65 shows the giant swamp taro pits on Ebon. Coconut plantations are the most common form of agriculture in RMI (Figure 66).

The main challenge to agriculture and animal husbandry on an atoll is scarcity of water and low soil fertility. RMI is located seven degrees north of the equator, which means there is a little variation in annual temperature. However, the northern part of the RMI is much drier with an annual average of 20 inches, compared to the average annual rainfall of 160 inches in the southern atolls. The negative trend in annual rainfall may contribute to a decrease in agriculture productivity, however the data trend is incomplete.

This indicator tracks the number of households involved in agriculture and livestock production, and the variety of crops being cultivated.

Status: Fair Trend: Deteriorating Data Confidence: Low

Based on anthropological evidence, the Marshallese depended on small scale agriculture prior to Western contact. This has declined based on the 2011 census. However, the RMI has not conducted a nationwide agricultural census to assess the area under cultivation, trends in crop production and economic output (Merlin et al, 1994).

In 2011, census data shows that over half the households were engaged in growing crops, a slightly lower percentage in raising livestock, and a fifth of the households involved in copra production (Census 2011). Fifty two percent of households were engaged in growing crops, mainly for subsistence, 42 percent grew crops for subsistence only, ten percent grew crops for both income and subsistence, and less than one percent grew crops for income alone (Figure 67). Both urban and rural populations were engaged at similar percentages in agricultural production (Figure 68). However, copra production in rural areas is nearly ten times higher than in urban areas due to the large amount of land needed to make it economically feasible.

Nearly all households were involved in agricultural production prior to Western contact. The current rate of 52 percent of households represent an obvious decline in agriculture participation. It is not possible to say when this decline occurred or whether it was fast or slow.

The Laura farmers' association, which provides local produce to the largest market in RMI, is collecting data on produce sold for 17 different crops. This dataset is the best available on quantity and variety of crops grown. While the Laura area is just one of many, it indicates the crop varieties grown and the seasonality of local crop availability.

Data from the Laura farmers' association shows seasonal trends in crop production, with the highest yields in the summer months (Figure 68). The top three products by weight are radishes, cucumbers and pell gourds. Given the

FIGURE 65. Iaraj – giant swamp taro plantation on Ebon (Mark Merlin).

FIGURE 66. Coconut Plantation in the RMI (Photo: Steve T. Trimble).

Theme 3: Marine

INSHORE MARINE ENVIRONMENT PERCENT LIVE CORAL COVER

Live coral reef cover is a significant indicator of the overall state of the inshore ecosystems. For this indicator, live coral cover is defined as the area covered with living coral, both stony and soft corals (Figure 79).

Coral cover provides an indirect measure of land-use impacts and erosion, fishing pressure, relative sea surface temperature (SST), presence of disease and predators like the crown of thorns starfish and mechanical damage from anthropogenic sources or natural phenomena like typhoons. Trends in live coral cover indicate the relative resiliency and health of coral ecosystem at a given site. This indicator is a basic data type for most surveys. The lagoon reef ecosystem is a critical factor in an atoll environment where it provides shelter, protein and income for local communities.

Status: Good Trend: Mixed Data Confidence: Medium

FIGURE 78B. Corals in Woja, Allinglaplap Oceanside (Photo by: Karl Fellenius).

Coral cover across atolls is relatively healthy, at or above the Indo-pacific average of 22 percent (Figures 80 and 81). Coral reefs in RMI undergo a cycle of decline and recovery from crown of thorns starfish (COTS) or typhoons. One example is the COTS outbreak in southern Majuro between 2004 and 2009 (Waddell, J.E. and A.M. Clarke (eds.), 2008).

Coral cover in RMI is relatively healthy. However, the coral bleaching event in 2014 may have reduced coral cover and recovery. A survey at the end of 2014 suggested that up to half of Majuro's coral cover was affected. Documentation of coral bleaching events in Majuro from 2008 to 2014 indicates that this is becoming more common. However, the dominant coral species found in Majuro is Porites rus, which is more resistant to changes in temperature and sunlight exposure compared to other species.

Variations in coral cover trends show higher coral cover in rural atolls, compared to urban atolls. However, the overall healthy reef system has the capacity to provide all the fish protein needed for human consumption now and into the future, provided appropriate management measures are put in place (PROCFish, 2009).

Consistent coral monitoring is needed at key sites to establish trends in live coral cover.

While coral cover data is not available prior to the nuclear tests in the 1950s, the current information for Bikini Atoll indicates that it represents an anomaly for the atolls for

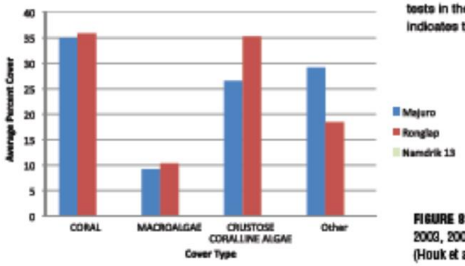
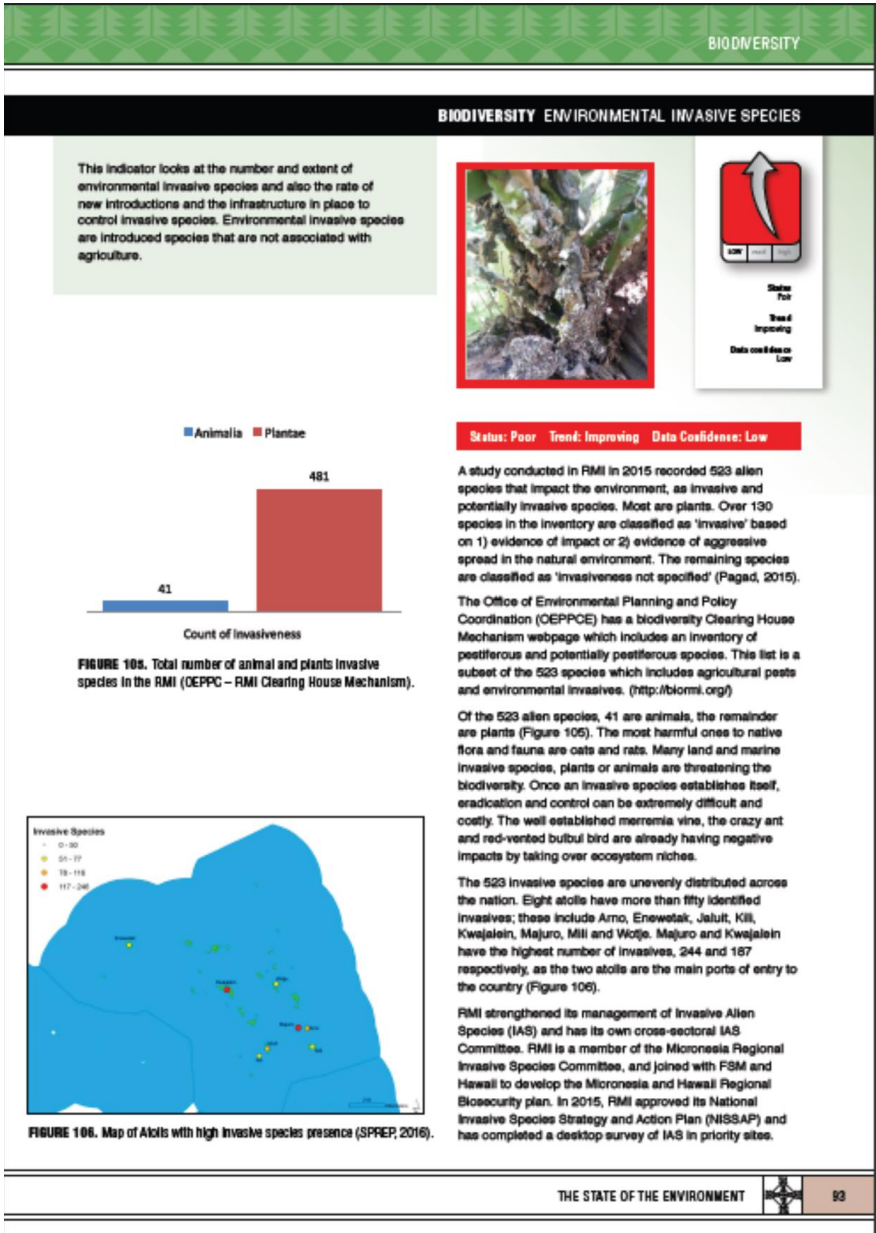


FIGURE 80. Majuro and Rongelap substrate categories from 2003, 2004 (NRAS). Namdrik was recently surveyed in 2013 (Houk et al, 2013).

Theme 4: Biodiversity



BIODIVERSITY

BIODIVERSITY ENVIRONMENTAL INVASIVE SPECIES

This indicator looks at the number and extent of environmental invasive species and also the rate of new introductions and the infrastructure in place to control invasive species. Environmental invasive species are introduced species that are not associated with agriculture.

FIGURE 105. Total number of animal and plants invasive species in the RMI (OEPPC – RMI Clearing House Mechanism).

Status: Poor Trend: Improving Data Confidence: Low

A study conducted in RMI in 2015 recorded 523 alien species that impact the environment, as invasive and potentially invasive species. Most are plants. Over 130 species in the inventory are classified as 'invasive' based on 1) evidence of impact or 2) evidence of aggressive spread in the natural environment. The remaining species are classified as 'invasiveness not specified' (Pagad, 2015).

The Office of Environmental Planning and Policy Coordination (OEPPCE) has a biodiversity Clearing House Mechanism webpage which includes an inventory of pestiferous and potentially pestiferous species. This list is a subset of the 523 species which includes agricultural pests and environmental invasives. (http://bionmi.org/)

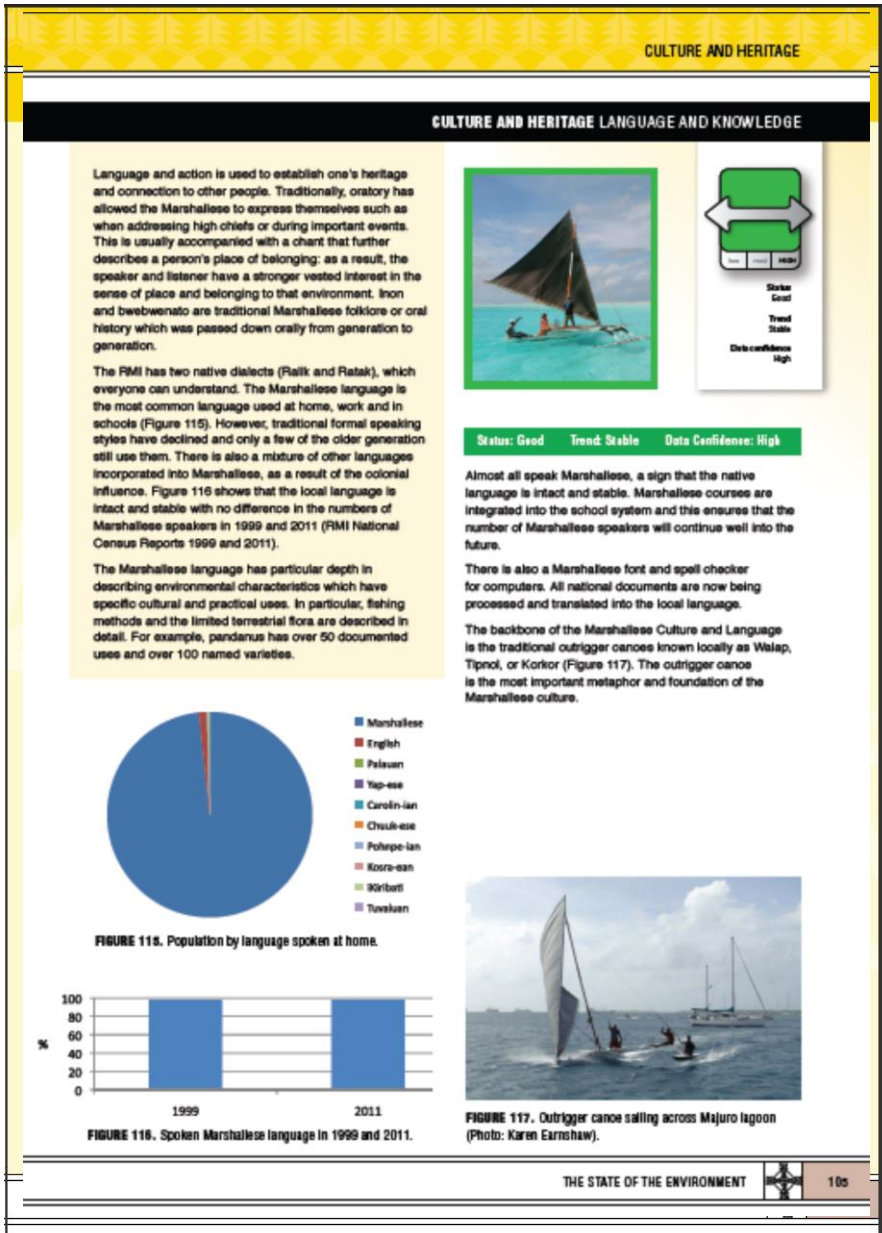
Of the 523 alien species, 41 are animals, the remainder are plants (Figure 105). The most harmful ones to native flora and fauna are cats and rats. Many land and marine invasive species, plants or animals are threatening the biodiversity. Once an invasive species establishes itself, eradication and control can be extremely difficult and costly. The well established merremia vine, the crazy ant and red-vented bulbul bird are already having negative impacts by taking over ecosystem niches.

The 523 invasive species are unevenly distributed across the nation. Eight atolls have more than fifty identified invasives; these include Arno, Enewetak, Jaluit, Kili, Kwajalein, Majuro, Mili and Wotje. Majuro and Kwajalein have the highest number of invasives, 244 and 187 respectively, as the two atolls are the main ports of entry to the country (Figure 106).

RMI strengthened its management of Invasive Alien Species (IAS) and has its own cross-sectoral IAS Committee. RMI is a member of the Micronesia Regional Invasive Species Committee, and joined with FSM and Hawaii to develop the Micronesia and Hawaii Regional Biosecurity plan. In 2015, RMI approved its National Invasive Species Strategy and Action Plan (NISSAP) and has completed a desktop survey of IAS in priority sites.

FIGURE 106. Map of Atolls with high invasive species presence (SPREP, 2016).

Theme 5: Culture and Heritage



CULTURE AND HERITAGE LANGUAGE AND KNOWLEDGE

Language and action is used to establish one's heritage and connection to other people. Traditionally, oratory has allowed the Marshallese to express themselves such as when addressing high chiefs or during important events. This is usually accompanied with a chant that further describes a person's place of belonging: as a result, the speaker and listener have a stronger vested interest in the sense of place and belonging to that environment. Inon and bwebwenato are traditional Marshallese folklore or oral history which was passed down orally from generation to generation.

The RMI has two native dialects (Ralik and Ratak), which everyone can understand. The Marshallese language is the most common language used at home, work and in schools (Figure 115). However, traditional formal speaking styles have declined and only a few of the older generation still use them. There is also a mixture of other languages incorporated into Marshallese, as a result of the colonial influence. Figure 116 shows that the local language is intact and stable with no difference in the numbers of Marshallese speakers in 1999 and 2011 (RMI National Census Reports 1999 and 2011).

The Marshallese language has particular depth in describing environmental characteristics which have specific cultural and practical uses. In particular, fishing methods and the limited terrestrial flora are described in detail. For example, pandanus has over 50 documented uses and over 100 named varieties.

Status: Good | Trend: Stable | Data Confidence: High

Almost all speak Marshallese, a sign that the native language is intact and stable. Marshallese courses are integrated into the school system and this ensures that the number of Marshallese speakers will continue well into the future.

There is also a Marshallese font and spell checker for computers. All national documents are now being processed and translated into the local language.

The backbone of the Marshallese Culture and Language is the traditional outrigger canoes known locally as Walap, Tipnol, or Korkor (Figure 117). The outrigger canoe is the most important metaphor and foundation of the Marshallese culture.

FIGURE 115. Population by language spoken at home.

FIGURE 116. Spoken Marshallese language in 1999 and 2011.

FIGURE 117. Outrigger canoe sailing across Majuro lagoon (Photo: Karen Earnshaw).

Theme 6: Built Environment

HAZARDOUS WASTE HOSPITAL, HOUSEHOLD AND WHITE GOODS WASTE

Hazardous waste consists of solid, gas or liquids that contain elements that pose a significant risk to public health or the environment. Effective transport, storage and end-of-life management of hazardous waste is extremely critical to preventing disease bearing materials and toxic chemicals from entering the environment. For the purpose of this indicator, hazardous waste includes:

- E-waste (electronic waste): from disposed computers, phones and other electronics containing heavy metals or other toxins.
- Bulky items and white goods: such as cars, tires and refrigerators that are difficult to dispose of and/or contain hazardous chemicals.
- Health Care Waste: including needles (sharps), bottles, blood and body tissues and materials that have come into contact with them. These items carry a significant health risk to anyone exposed.
- Asbestos: a fibrous, fire-proof building material used in the mid to late 1900's in roofs, paint, walls, stucco and other materials. Fibres released during handling and destruction of materials cause asbestosis, a serious lung disease. (RMI has no or a very small amount of asbestos).
- Batteries: Including car, boat and other engine batteries, as well as batteries from electronic devices.
- Other household toxins: including solvents, paints, pesticides and other household chemicals.

Status: Poor Trend: Improving Data Confidence: Low

E-waste, white goods, batteries, household chemicals and bulky waste such as cars are collected as general waste and taken to Majuro landfill. While there is no separation of the waste at the source, some hazardous wastes are separated at the landfill, including batteries, white goods and computers. There has been an increase in TVs, stoves, phones, air conditioning units and computers over the past decade (Figure 136).

According to Pattle Delamore Partners Ltd (PDP, 2015), there is limited data on toxic waste, but it is believed that chemical and hazardous wastes are being illegally dumped in RMI. It is an EPA arrangement that all waste oil generated in Majuro is received by the Majuro Energy Company. This is used in power generating by burning to produce electricity.

Health care waste is handled by Island Supplies International (ISI) who runs the incineration plant for hospital waste. The ash is buried in multiple cement lined pits at the incineration site; however financial support is required to continue outsourcing treatment to ISI (PacWaste Baseline report). No health care waste is dumped at the landfill. However sharps medical tools are disposed of in a SteriMed 70 healthcare waste processor, while other health care waste in Ebeye, including pharmaceuticals, pathological and anatomical waste, is disposed of in an unlined landfill open to scavengers. There is little asbestos in RMI, the only notable amount is in water pipes and poses a small threat while buried in place (PACWASTE 2015).

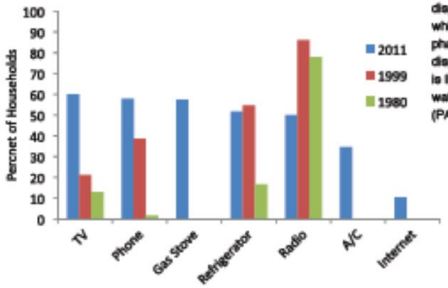
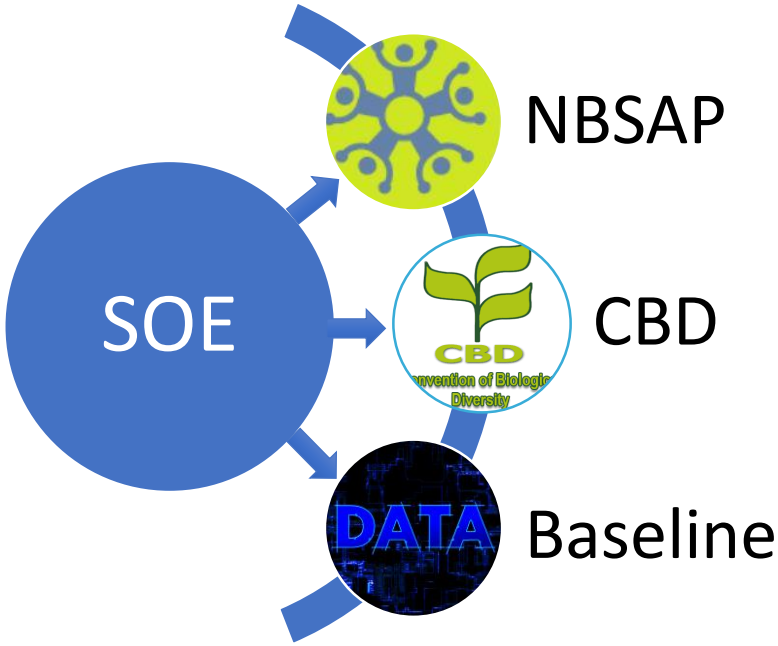


FIGURE 136. Percentage of households with appliances (Marshall Islands Census 1987, 1999, 2011).

Regional and Global reporting Links

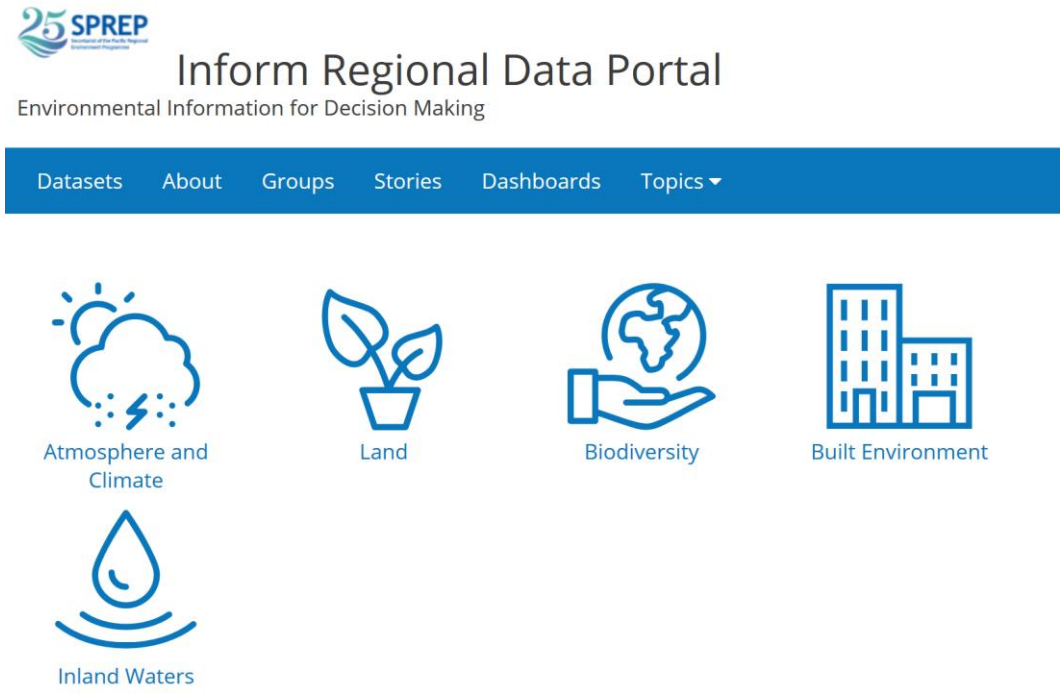
- National state and status is the focus
- MEAs, SDGs, S.A.M.O.A Pathway



ENVIRONMENTAL INFORMATION FOR DECISION MAKING

Links to Environmental Data Management

- SOEs require data and information
- The Inform project has used the SOE process to gather data to populate the data portals



Knowledge Café

- Knowledge café style session to facilitate sharing of experiences on SoE and MEA reporting.

ENVIRONMENTAL INFORMATION FOR DECISION MAKING

Directions Knowledge Café

- Four Groups
- Lead by – Samoa, Cooks, RMI, Niue

First round - 20 minutes

Second round - 20 minutes

Wrap up in plenary – 10 minutes

ENVIRONMENTAL INFORMATION FOR DECISION MAKING

Broad discussion topics

- Experience in preparing SoE reports which includes the SoE formulation process, approval and implementation
- Role of the SoE reporting process as the basis for sector and national level reporting including reporting to regional and international commitments such as MEAs, SDGs and SAMOA Pathway?
- Has your country established a national environmental portal and how has it been used to support planning, reporting decision making?

Inform
ENVIRONMENTAL INFORMATION FOR DECISION MAKING

Thank you