



SPREP
Secretariat of the Pacific Regional
Environment Programme



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Volume 1: Executive Summary

RESEARCH REPORT-ASSESSMENT OF ALTERNATIVES TO SINGLE-USE DISPOSABLE DIAPERS

April 2022



Reducing Environmental Effects while Considering Social and Economic Factors

Research report to assist decision making - analysis of current single-use disposable diaper practices in the Pacific, and a review of viable alternatives.

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Our vision: A resilient Pacific environment sustaining our livelihoods and natural heritage in harmony with our cultures.

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PacWastePlus Programme

The Pacific – European Union (EU) Waste Management Programme, PacWastePlus, is a 72-month programme funded by the EU and implemented by the Secretariat of the Pacific Regional Environment Programme (SPREP) to improve regional management of waste and pollution sustainably and cost-effectively.

About PacWastePlus

The impact of waste and pollution is taking its toll on the health of communities, degrading natural ecosystems, threatening food security, impeding resilience to climate change, and adversely impacting social and economic development of countries in the region. The PacWastePlus programme will generate improved economic, social, health, and environmental benefits by enhancing existing activities and building capacity and sustainability into waste management practices for all participating countries.

Countries participating in the PacWastePlus programme are: *Cook Islands, Democratic Republic of Timor-Leste, Federated States of Micronesia, Fiji, Kiribati, Nauru, Niue, Palau, Papua New Guinea, Republic of Marshall Islands, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu.*

KEY OBJECTIVES

Outcomes & Key Result Areas

The overall objective of PacWastePlus is “to generate improved economic, social, health and environmental benefits arising from stronger regional economic integration and the sustainable management of natural resources and the environment”.

The specific objective is “to ensure the safe and sustainable management of waste with due regard for the conservation of biodiversity, health and wellbeing of Pacific Island communities and climate change mitigation and adaptation requirements”.

Key Result Areas

- Improved data collection, information sharing, and education awareness
- Policy & Regulation - Policies and regulatory frameworks developed and implemented.
- Best Practices - Enhanced private sector engagement and infrastructure development implemented
- Human Capacity - Enhanced human capacity

Learn more about the PacWastePlus programme by visiting



<https://pacwasteplus.org/>

About this Research Publication Series

Single-use disposable diapers have been identified as a waste issue in Pacific countries, both in landfills and as a commonly littered item. Three Pacific countries (Kiribati, Vanuatu and Tuvalu) have implemented import controls to assist with the management of single-use disposable diapers, the only known measures of their kind in the world. However, the need to contain and manage baby excreta to reduce public health risks is well understood, as is the need for economic growth and equality and inclusion in today's Pacific societies, ensuing women are encouraged into the workforce and to contribute to community activities.

The Pacific therefore faces a challenge: attempting to reduce environmental risks from the disposal of single-use disposable diapers, while balancing the social and economic benefits that single-use disposable diapers bring. Currently there is a lack of reliable information on suitable alternatives for single-use disposable diapers to enable informed decisions in the Pacific Island context.

This research, commissioned by the Secretariat of the Pacific Regional Environment Programme (SPREP) through the European Union's funded PacWastePlus Programme, therefore aims to fill this gap by providing information to:

- Guide informed decision making for governments when developing policy controls to reduce environmental effects from single-use disposable diapers, while balancing social and economic factors
- Inform communities and the private sector on viable alternatives to current single-use disposable diaper use and disposal practices for the Pacific.

Assessment of Alternatives to Single-use Disposable Diapers Publication Series

Volume 1: Executive Summary



Summary of the research background and key findings

Volume 3: Field Work and Results



Details of the research methodology and findings for each research component

Volume 4: Guidance for Decision Makers



Guidance for informed decision making for governments when developing policy controls to reduce environmental effects from single-use disposable diapers, while balancing social and economic factors

Volume 2: Literature Review



Research report that provides details on the background of single-use disposable diapers and alternative infant hygiene garments and review of global policies addressing single-use disposable diapers management

Volume 5: Guidance for Communities and Private Sector












Informs communities and the private sector on viable alternatives to current single-use disposable diaper use and disposal practices

Glossary

Item	Description
Engineers Without Borders	For-purpose organisation creating social value through engineering. Completed social and technical components of this research.
Escherichia coli (E. coli)	Bacteria found in the environment, foods, and human excreta. E. coli can make humans sick with diarrhoea and other illnesses.
Excreta	Waste matter (such as urine and faeces) eliminated from the body
Infant hygiene garments	Covering used to contain baby excreta including single-use disposable diapers and reusable nappies
Pit latrine or ventilated pit (bush toilet / long drop)	Type of toilet that collects human excreta in a hole in the ground
Reusable nappy	A cloth garment, traditionally square and made from towelling, but more recently including modern cloth nappies. They are reusable and require laundering. The local vernacular differs in describing these types of products. For example, in Vanuatu and Samoa, the word 'napkin' is used for this type of nappy, and in Tonga 'napikeni' is used. Components of reusable nappies are provided in the following illustration.
Rural	Small villages with a low population, outside cities or towns
Secretariat of the Pacific Regional Environment Programme (SPREP)	Inter-governmental organisation established by the Governments and Administrations of the Pacific charged with protecting and managing the environment. Commissioned this research.
Single-use biodegradable, eco/environmentally friendly, compostable diaper (eco-friendly / compostable single-use diaper)	A single-use garment that has waterproof qualities similar to those in single-use disposable diapers, but that claim biodegradability, environmentally friendliness, or compostability. These diapers are commonly made from cellulose, chlorine-free wood pulp, super absorbent polymer (SAP), cotton, bamboo, and other plant-based fibres. Most versions use non-compostable (petrochemical-based) plastics for fasteners.
Single-use disposable diaper	A single use, throw away garment that is waterproof, and fitted. Single-use disposable diapers are available to be used from birth until babies are potty trained. Single-use disposable diapers are manufactured with a range of petrochemical-based plastics, and a complex combination of polymer types.
Super Absorbent Polymer (SAP) (also known as slush powder)	A water-absorbing polymer that can absorb and retain extremely substantial amounts of a liquid. Primarily used as an absorbent solution for diapers. Main ingredients are acrylic acid, and sodium hydroxide.
Urban	Densely populated area, usually a city or town, usually provided with government services such as water and wastewater
Wastewater soak-away area	Typically, a pit, filled with natural liner/filtration such as gravel or aggregates, into which wastewater is piped so it can drain slowly out into the surrounding soil

Components of Reusable Nappies'

Components	Illustration	Description
Prefolds		Flat square of fabric with thicker middle panel sewn in, eliminating some folding
Fitteds		Fabric diapers that have sewn-in elastic and often fasteners such as snaps or velcro
Covers		Water resistant material that is used over an absorbent piece such as prefold, fitted, or insert.
Inserts and Boosters		Absorbent layer you add to your nappy to absorb fluids
Pockets		Diapers with a waterproof cover already sewn to the outside, a fabric inside layer, and an opening for stuffing inserts.
All-in-One		Diapers sewn all together with inserts, waterproof cover, and fasteners all in one piece.
All-in-Two		Waterproof outer covers that feature either lay-in or snap-in inserts.
Liner		Thin top layer helps catch solids and reduce soiling. Usually designed to draw moisture. Can be disposable or reusable.
Modern Cloth Reusable Nappy (Modern Cloth Nappy)		Fitted premade reusable nappy design similar to single-use disposable diapers but able to be washed and reused

Executive Summary

Background

The transition to a more convenient lifestyle over the last seventy years has seen a dramatic increase in single-use plastic items onto global markets (UNEP, 2018). Included in the range of items are single-use disposable diapers.

Although convenient in their use, the post-use disposal of these items is increasing solid waste that is difficult to manage and has significant impacts on our environment (UNEP, 2021).

Global estimates on the number of single-use disposable diaper used on one baby ranges from 4,000 to 7,000, with each Diaper reported to take nearly 500 years to decompose (Miller-Wilson, 2021; Dyer, 2005; Khoo et al., 2019).

The Pacific region has not been excluded from the increasing presence of single-use disposable diapers.

An estimated 815,500,000 single-use disposable diapers are used by families in the Pacific every year¹, resulting in approximately 173,000 tonnes of waste disposed in landfills, burnt, or discarded in the environment.

Figure 1: Disposal of single-use disposable diapers in the Pacific

An estimated
815,500,000
single-use disposable diapers
are used by families in the Pacific
every year



57 million single
use disposable diapers are
BURNT



371.5 million single use
disposable diapers end up in our
ENVIRONMENT



387 million single use
disposable diapers end up in managed
LANDFILLS & DUMPS



¹ Calculated using census data which found there are 797,997 children aged under 3 in the 15 PacWastePlus member countries. Section 4 of this study found 70% of children used an average of four single-use disposable diapers per day, up to the age of 3

Purpose of Study

Single-use disposable diapers have been identified as a waste issue in Pacific countries, both in landfills and as a commonly littered item.

Three Pacific countries (Kiribati, Vanuatu, and Tuvalu) have implemented import controls to assist with the management of single-use disposable diapers, the only known measures of their kind in the world. However, the need to contain and manage baby excreta to reduce public health risks is well understood, as is the need for economic growth and equality and inclusion in today's Pacific societies, ensuing women are encouraged into the workforce and to contribute to community activities.



Currently there is a lack of reliable information on suitable alternatives for single-use disposable diapers to enable informed decisions in the Pacific Island context.

This research sought to:

- Explore current **practises** on the use and disposal of single-use disposable diapers, reusable nappies, and eco-friendly / compostable diapers in the Pacific
- Explore current **perceptions** on the use and disposal of single-use disposable diapers, reusable nappies, and eco-friendly / compostable diapers in the Pacific
- Explore the **physical performance** of reusable nappies and eco-friendly / compostable diapers in the Pacific
- Identify and understand **barriers and opportunities** for reducing environmental impacts associated with single-use disposable diaper disposal in Pacific communities, balancing social and economic factors





Research Objective - Explore Current Practises for the Use and Disposal of Single-use Disposable Diapers, Reusable Nappies, and Eco-friendly /Compostable diapers in the Pacific

Key Findings

- Of Pacific families involved in this research, **84% use single-use disposable diapers** all (59%) or some (25%) of the time (in combination with reusable nappies), and **13% of families use only reusable nappies**, with a microfiber or cotton square cloth towel the most common type used. One percent of survey participants reported to using eco-friendly / compostable diapers.
- Use of single-use disposable diapers is slightly more common in urban areas, with **70% of families predominantly use single-use disposable diapers**, while **50% of those in rural areas predominantly use single-use disposable diapers**.
- On average, **diapers are changed 4 times per day** (compared to 5 to 8 in worldwide literature (UNEP 2020)). For families using reusable nappies, an average of 24 nappies are used on rotation for each child.
- The most common way to discard single-use disposable diapers is authorised **waste collection (37%)**, only evident in urban areas (who have a waste collection); with rural areas relying on **burying (25%)**, disposal in **pit latrines (9%)** and **burning (7%)**.
- The most common method for washing reusable nappies in both rural and urban areas is with a **bucket (77%)**. Other **households (22%) use a natural waterway (river or sea)**.
- A significant cost advantage was calculated towards using reusable nappies; a saving of at least **USD1,377** over the three years a baby uses nappies or diapers.

Table 1 Cost Estimates Comparing Nappies and Diapers in the Pacific

Product	Cost per unit ¹	Number used per day ²	Number needed (upfront)	Upfront Cost	Estimated annual costs for washing ³	Cost - Year 1	Cost - For 3 years ⁴
Flat / Cloth square reusable nappies	\$2.25	6	24	\$54	\$38	\$92	\$169
Modern cloth reusable nappies	\$10.85	6	24	\$260	\$38	\$299	\$375
Single-use disposable diapers	\$0.40	4	0	\$0	\$0	\$584	\$1,752

All costs in USD; Calculation is for one child

Assumptions:

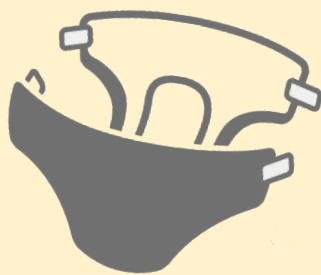
1. Pacific costings: obtained from market analysis and supported by interview and focus group participants
2. Informed from participant responses
3. Cost for washing
 - Cost of washing one load of ~12 nappies (cold of tepid water; hand washing in a bucket) = USD0.21c (Water (15L) USD0.01; Soap (20gm) USD0.20)
 - Water is an estimate based on UNELCO water tariff for Vanuatu
 - Washing powder and bar soap costs are estimates from Vanuatu and Fiji suppliers
 - Number of washes is estimated from participant responses and literature



Research Objective - Explore Current Perceptions on Use & Disposal of Single-use Disposable Diapers, Reusable Nappies, & Eco-friendly / Compostable Diapers in the Pacific

Many perceptions were uncovered regarding single-use disposable diapers, reusable nappies, and eco-friendly / compostable diapers through this study, many of which, through the technical study, were found to be misguided. The following illustrations summarises the key perceptions identified.

Key Perceptions of Single-Use Disposable Diapers in the Pacific



Single-use disposable diapers

Are higher performing and can be kept on babies for a long term

YES, the quality and performance of single-use disposable diapers was found to be widely accepted.



However, the perception that single-use disposable diapers stay dryer on a baby for longer is a **common misperception**.

This practise may impact

- the health and development of babies
- their ability to balance and walk
- can cause urinary tract and other infections



Eco-friendly / compostable single-use diapers compost easily

NO, there are currently no known eco-friendly / compostable diapers on the market able to claim 100% biodegradability or compostability. **Eco-friendly / compostable single-use diapers do not degrade / compost naturally** in the environment; they need specialist infrastructure such as controlled high temperatures and microbial composting facilities

Are commonly available and cheap

Available, YES – commonly found in all stores in both rural and urban areas.



\$ Cheap, NO – families may spend over **USD500 per year** on single-use disposable diapers for **one child**

Baby excreta is not harmful and therefore single-use disposable diapers in the environment do not have a negative effect



NO, discarded diapers may take **500 years to break** and can **pollute soil & oceans** and baby excreta can be a source of bacteria

Burning is a good way to remove the waste

NO, can emit dioxins and toxic fumes, and **affect our health**



Key Perceptions of Reusable Diapers in the Pacific



Reusable diapers



People who use reusable nappies are poor

NO, families choosing reusable nappies do so also for social (health) and environmental reasons



Reusable nappies can also be seen as a “wise household choice” that can free up budget for other activities



The upfront costs of reusable nappies are expensive

Upfront costs can be as little as \$54 for common flat / cloth square reusable nappies.

Use of reusable nappies may represent a saving of at least USD1,377 over 3 years.



Wastewater from reusable nappies is not a risk to public health

NO, without management, reusable nappies wastewater disposal sites can be a source of *E. coli* and other health effects



Reusable nappies are hard to clean and hard to dry

The technical testing found that reusable nappies were generally found to be **easy to wash and dry**.

Participants liked microfiber inserts (even if they had to be doubled), due to washing and drying



Reusable nappies only include the old-style cotton flat towels



NO, reusable nappies can now come with many “accessories” including plastic clips, covers, and liners to assist user experience.

Also available are ‘modern cloth nappies’, that are fitted premade designs similar in design to single-use disposable diapers.

Reusable nappies are less effective than single-use disposable diapers

NO, study participants found that the level of absorbency / leakage found in reusable nappies was generally good, except for the cheapest products.



If I use reusable nappies, I have to use them all the time

NO, a combination approach may be appropriate for many households – i.e., using reusable nappies when at home during the day, but using disposable diapers when travelling, at events, and during the night

Using reusable nappies will limit my ability to work

NO, options may be available assist parents when using reusable nappies, include a nappy washing service and/or assisting childcare to use reusable nappies.

Also using a combination approach may be appropriate – disposable diapers used on babies when parents are at work.





Research Objective - Explore the Physical Performance of Reusable Nappies and Eco-friendly / Compostable Diapers in the Pacific

Reusable Nappies

The reusable nappies useability and washability test highlighted two key misconceptions regarding reusable nappies. Throughout the socio-economic study reusable nappies were described as “a lot of work” and having a low performance (“more leaks”). However, the physical test highlighted those reusable nappies were generally found to be easy to wash and the level of absorbency / leakage, except for the cheapest products, was generally good. The socio-economic study also highlighted a tendency for households to use (either through choice or due to lack of availability) the cheapest reusable nappies models, which have low quality standards. Through the technical study, these low-quality products were found to generate dissatisfaction and therefore the need to replace worn out nappies would negate any environmental and cost-saving benefits. The research found that, when provided with a variety of options and choices, testers valued quality components. Better quality was also seen to reduce nappy rashes and discomfort for babies.

Other findings included the “accessories” now associated with reusable nappies (covers, pocket covers, liners, and nappy fasteners), add to the user experience for using reusable nappies. Liners were loved by every tester. This product is not commonly available in the Pacific and was not familiar to participants, however it was found to make washing the nappies much easier and more efficient.

Eco-friendly / Compostable Single-use Diapers

The research found there are currently no known eco-friendly / compostable diapers on the market able to claim 100% biodegradability or compostability. Eco-friendly diapers do not reduce volumes in landfills, and they do not degrade / compost automatically in the environment. Additionally, the presence of petro-chemical based fasteners and absorbency materials make the products a contaminant rather than a benefit to any industrial composting, where such infrastructure is available.

The market research component of the research found:

- biodegradability or compostability claims are chosen for consumer appeal, to make them unique and different from the other brands. Some brands do not provide evidence of their claims.
- most brands focus on particular eco-friendly claim with one aspect of their product rather than the product as a whole
- the compostability rate is usually not written on the packaging as it is often only between 50% to 90%
- compostability rates are provided by some brands (e.g., *Ecoriginal* 90%, *g-Diapers* also called *Eenee* 100%) but they do not include Super Absorbent Polymer (SAP) (that are mostly non-compostable). SAP can comprise 30% of diaper weight.
- one brand (*g-Diapers / Eenee*) has removed the elastic part that is usually non-compostable and replaced it with a reusable elastic belt in a unique design that offers reusability with convenience in a potentially compostable single-use diaper.

Technical field studies are currently being undertaken globally, including in Tuvalu, to further explore the characteristics and feasibility of certain eco-friendly / compostable diapers. Decision makers in the Pacific are recommended to follow this research and consider identified infrastructure (i.e., composting facilities with controlled high temperatures and microbial activity) prior to making any decision promoting the use of eco-friendly / compostable diapers.



Research Objective - Identify and Understand Barriers and Opportunities for Reducing Environmental Impacts Associated with Single-use Disposable Diaper Disposal in Pacific Communities, Balancing Social and Economic Factors

Several technical, socio-economic and market / availability barriers were identified preventing the sound environmental management of single-use disposable diapers and adoption of alternatives to single-use disposable diapers. The following sections summarise these barriers and provides information on opportunities decision makers can consider.

Barriers and Opportunities for the Management of Single-use Disposable Diapers

Lined, engineered landfills are currently the best environmental option for disposal of single-use disposable diapers. Thirty-seven percent of households in the pacific were found to have access to an authorised community landfill, with the remainder disposing used single-use disposable diapers to the environment (burying or dumping in waterways or on vacant land) or burning.

A key barrier identified for the sound environmental management of single-use disposable diapers is the lack of knowledge (by community leaders and households) on the best disposable practices available.

The following illustrations summarises the “do’s” for communities, depending on waste collection and water facilities available, and information on “do not’s”. **Note:** It presents the recommended environmental options for use and disposal of diapers and nappies and does not factor in social or economic costs and benefits. Communication with communities is recommended prior to implementing any policy, protocol, or “community rule”.



Communities WITH Waste Collection



Communities WITH REGULAR WATER

1 Use reusable nappies whenever possible



Recommended practice:

- Empty baby excreta into toilet or ventilated improved pit toilets (*or other*)
- Wash reusable nappies in a bucket
- Take care to empty wastewater away from children, pets, water supplies and gardens, in either a flush toilet or in a dedicated soak-away where dry toilets are used
- Dry reusable nappies in the sun to use UV to disinfect any E.coli



Option: Construct community designated soak-away area – away from groundwater, water supplies and gardens

2 If single-use disposable diapers are used



Recommended practice:

- Empty baby excreta into toilet or ventilated improved pit toilets (*or other*)
- Put out for collection (*taking care to keep away from dogs and other wildlife*)



Recommendation: Construct community dog-proof waste collection platforms / cages



Communities WITHOUT REGULAR WATER

1 Use single-use disposable diapers



Recommended practice:

- Empty baby excreta into toilet or ventilated improved pit toilets (*or other*)
- Put out for collection (*taking care to keep away from dogs and other wildlife*)



Recommendation: Construct community dog-proof waste collection platforms / cages

Alternative Use reusable nappies



Recommended practice:

- Empty baby excreta into toilet or ventilated improved pit toilets (*or other*)
- Use seawater or rainwater water in a bucket to wash nappy (*if using seawater, try to rinse with rainwater after cleaning, and use rainwater every so often (when possible) to remove the hardness of the nappy*)
- Take care to empty wastewater away from children, pets, and water supplies into a soak-away where dry toilets are used
- Dry reusable nappies in the sun to use UV to disinfect any E. coli



Option: Construct community designated soak-away area for nappy wastewater – away from groundwater, water supplies and gardens

Communities WITHOUT Waste Collection



Communities WITH OR WITHOUT REGULAR WATER



Use reusable nappies whenever possible



Recommended practice:

- Empty baby excreta into toilet or ventilated improved pit toilets (or other)
- Use seawater or rainwater water in a bucket to wash nappy (*if using seawater, try to rinse with rainwater after cleaning, and use rainwater every so often (when possible) to remove the hardness of the nappy*)
- Take care to empty wastewater away from children, pets, and water supplies into a soak-away where dry toilets are used
- Dry reusable nappies in the sun to use UV to disinfect any E. coli



Recommendation: Construct community designated soak-away area for nappy wastewater – away from groundwater, water supplies and gardens

Alternative

Single-use disposable diapers



Recommended practice:

- Empty baby excreta into toilet or ventilated improved pit toilets (*or other*)
- Bury used diapers in controlled, covered pits



Recommendation: Construct community designated disposal area – away from groundwater / lined with clay or impervious surface



Research Objective - Barriers and Opportunities for the Adoption of Alternatives to Single-use Disposable Diapers

Technical, socio-economic and market / availability barriers were identified preventing the adoption of alternatives to single-use disposable diapers. **Table 2** summarises these barriers and provides information on opportunities decision makers can consider.

Table 2 Barriers and Opportunities for the Adoption of Alternatives to Single-use Disposable Diapers

Barrier	Finding	Opportunity
Technical barriers		
Lack of infrastructure for reusable nappy management, such as water availability for washing	<p>61% of households share a water source with other household(s)</p> <p>47% of households have access to an individual flush toilet; 10% of households share a toilet facility</p> <p>Common sites for washing reusable nappies are buckets, using sea water, groundwater, and tank water. There are no known designated soak-away systems for nappy wastewater in communities.</p> <p>High levels of E. coli were found in background water</p>	<p>Governments or donor investment in increasing water supply for communities, increased toilet facilities, and designated areas for wastewater disposal to contain excreta from reusable nappies.</p> <p>Regular water quality testing advised in designated wastewater / soak-away systems to identify any outbreaks and reduce risk of illness.</p> <p>Education for households on appropriate washing techniques for reusable nappies and wastewater disposal</p>
Perception that reusable nappies are difficult to use in the Pacific climate and have low performance / low absorbency	<p>73% of households use single-use disposable diapers as they are easy and convenient; and 12% because they are comfortable for baby, can stay on for longer, and do not leak</p> <p>Being “a lot of work” and taking a “long time to dry” are the common perceptions against using reusable nappies.</p> <p>The technical assessment found reusable nappies were in fact easy to wash and the level of absorbency / leakage, except for the cheapest products, was generally good</p>	<p>Work with community leaders and champions to develop locally appropriate educational materials on why to use/how to use reusable nappies effectively</p> <p>Promotional campaigns to increase awareness of the benefits of reusable nappies</p> <p>Advertising that using a combination approach (reusable nappies and disposable diapers) may be an achievable option for families</p> <p>Adopting quality import standards to ensure available reusable nappies are of good quality, increasing user experience and increasing their life</p> <p>Governments or donor investment for Pacific based businesses to develop modern cloth nappies, to increase reusable nappy quality and availability</p>

Barrier	Finding	Opportunity
Overstated eco-friendly / composability claims for eco-friendly / compostable diapers	<p>No 100% compostable diapers were found to be available for Pacific countries</p> <p>Confusion for consumers on eco-friendly / composability claims</p> <p>Existing studies underway may provide Pacific-based evidence for eco-friendly / compostable diapers, however, separate collection and compost infrastructure is necessary</p>	<p>Follow current research (especially in Tuvalu) to substantiate claims of selected eco-friendly / compostable diapers</p> <p>Consider required infrastructure (i.e., controlled high temperatures and microbial composting facilities) prior to implementing policy to promote eco-friendly / compostable diapers.</p> <p>Work with suppliers to develop standards and guaranteed supplies of substantiated products</p>
Socio-economic barriers		
Perception of low-socio economic beliefs surrounding reusable nappy use	<p>Using reusable nappies is seen as a sign of poverty, of being from a less developed area/community, and that families are unable to afford to buy disposable diapers.</p> <p>Many see using reusable nappies as a move ‘backwards’ as the rest of the world benefits from the convenience of disposable diapers</p>	<p>Promotional campaigns to increase interest and awareness of the financial and community benefits from increased reusable nappy use</p> <p>Advertise cost savings associated with reusable nappies (Table 1) as a “wise household choice” that can free up budget for other activities</p> <p>Work with community leaders and champions to develop locally appropriate educational materials on why to use/how to use reusable nappies effectively</p>
Perception of lack of affordability – upfront and maintenance costs for reusable nappies	<p>Varying perspectives of affordability of reusable nappies, with a common perception that reusable nappies are a sign of poverty; however other feel they are expensive, with expensive upfront costs and a lack of funds to pay for ongoing cleaning products</p> <p>A significant cost advantage was found for using reusable nappies (Cost for 3 years = USD375; compared to USD1,752 for single-use disposable diapers); a saving of USD1,377</p>	<p>Promote cost/benefit information for parents to show financial benefits of using reusable nappies – including upfront cost and maintenance costs</p> <p>Adopting quality standards to ensure available reusable nappies are of higher quality, increasing their life and user experience</p> <p>Governments or donor investment for Pacific based businesses to develop modern cloth nappies, to increase reusable nappy quality and availability</p>
Limited support for parents using reusable nappies	<p>Using reusable nappies takes time away from working opportunities and other community activities</p>	<p>Governments or donor investment for entrepreneurial activities such as community laundry services, or assistance for childcare providers to have facilities to enable acceptance of children using reusable nappies</p>
Lack of education and awareness of how to use reusable nappies and their benefits	<p>A consistent thread through the findings is a lack of awareness of how to use reusable nappies and their benefits</p> <p>‘Experts’ currently delivering community education have a low level of knowledge of use and benefits of reusable nappies, minimal awareness raising conducted by governments</p>	<p>Educational campaigns including cross-departmental approaches, and working with NGOs and communities to ensure consistent messaging</p> <p>Develop resources and deliver training for antenatal and postnatal care</p>

Barrier	Finding	Opportunity
Market / availability barriers		
Limited availability of quality reusable products, in rural areas	Generally low stocks of reusable nappies were found in stores, particularly in rural areas	Governments working with suppliers to develop standards and guaranteed supplies of quality nappies
	Low quality products commonly found, these products found to reduce user experience and often increase costs of using reusable nappies (three needing to be used at a time)	Encourage suppliers in rural areas to stock quality reusable nappies Subsidise or provide a “starter’s kit” of reusable nappies for parents, available from health clinics – with education on how to use them
	The use of liners with reusable nappies was trialled in the technical study and were loved by all testers as they improved absorbency and reduced need to handle excreta	Investigate Pacific made modern cloth nappies to provide higher quality products at an affordable rate Encourage suppliers to stock and promote reusable liners
		Education on the use of liners (and the need to appropriately clean and dispose them)



Do Not: Dispose single-use disposable diapers in Waterways, Oceans, or the Environment

Single-use disposable diapers may take **500 years to break down** in the environment. They can release chemicals and bacteria and may entangle land and marine animals. When single-use disposable diapers eventually start to decompose, they break into smaller particles called “**microplastics**”, which can be eaten by fish and end up in food eaten by us.



Do Not: Burn single-use disposable diapers

Burning of single-use disposable diapers will **emit dioxins and toxic fumes**. These fumes may affect our health and may spread into the surrounding environment (*into food and water sources*). Bury used diapers in controlled, covered pits.



Do Not: Dispose single-use disposable diapers in areas near water supply and gardens

Single-use disposable diapers in the environment may release chemicals such as dioxins, heavy metals, and bacteria from the baby excreta into the soil and water. These chemicals may end up in gardens and can **spread pollution and disease**.



Do Not: Dispose reusable nappies wastewater near groundwater, water supplies and gardens

Untreated wastewater, including from washing reusable nappies, has the potential **spread disease and contaminate soil and drinking water** sources. Most outbreaks of waterborne illnesses can be traced to wells or water supplies contaminated by sewage.



Opportunities for Decision Makers

Policy controls, infrastructure improvements, and increased communication were identified as opportunities for Pacific decision makers to assist with the management of single-use disposable diapers and adoption of reusable nappies.

There is no 'one size fits all' fix so decision makers are recommended to consider opportunities and design solutions appropriate for their communities in consultation with stakeholders (including parents, church and community groups, village Chiefs, local businesses, healthcare professionals, educators, waste managers, etc).



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