

Optimising the usage of expired consumables in NCID

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7/1/25



1. Reason for Action Go No Go

There is a large amount of expired consumables discarded as general waste, adding to the fast-filling landfill in Singapore.

Reflections: Large amount of healthcare waste is a "burning platform" platform

4. Gap Analysis Go No Go

- Nurses do not have knowledge on climate change impact on health and sustainability initiatives
- There is no established process for upcycling
- There is a lack of policy or guidelines on upcycling
- There is a lack of guidelines on waste segregation

Root Causes: No Process; No Knowledge

Reflections: Leverage on Personae for solutioning

7. Completion Plan Go No Go

MONTH / YEAR	WEEK	MILESTONE	STATUS
JUN 24	4	Formulation of dashboard	Completed
SEPT 24	4	Reiteration of dashboard (vs.2)	Completed
OCT 24	1-3	Gathering feedback	Failed/ To pivot
NOV 24	2-4	Pivot to miniseries; Formulating content for miniseries	Completed
DEC 24	1-3	Delivery of miniseries to 2 wards	Completed
JAN 25	2-3	Analysis on effectiveness.	In Progress
FEB-MAR 25		To deliver miniseries to all inpatient nurses in general ward setting	TBC
FEB 25-		To review inventory stockpile (upstream)	

2. Initial State Go No Go

46% of consumables are directly diverted away from landfills

	Initial (Jul-Sept 24)	Target
Outcome Measure		
Expired consumables diverted	46%	60%
Balance Measure		
Incidences of expired consumables used for care(n=)	0/ month	0/ month

5. Solution Approach Go No Go

ENVIRONMENT
Sharing of resources:
• Transfer of carbon savings by donating expired consumables to receiving institutions

ENVIRONMENT
"Not just a student" programme:
• Reduce transportation carbon footprint and cost

GOVERNANCE
Policy:
• Establish a policy for expired consumables management

GOVERNANCE
Protocol:
• Algorithm (RPA) to prioritise diversion

ENVIRONMENT
Monthly dashboard:
• Raise staff awareness of initiatives to influence ordering patterns

SOCIAL
"Not just a student" programme:
• Raise the awareness of waste reduction and engage the future workforce

SOCIAL
Mini-series Inservice Talks:
• Raise the awareness of climate change on health.

Reflections: Using the ESG approach, making changes in the environment and social sphere will help drive the governance sphere to ensure sustainability of the proposed solutions.

8. Confirmed State Go No Go

	Initial (Jul-Sept 24)	Target	Confirmed (Jul-Dec 24)
Outcome Measure			
Expired consumables diverted	46%	60%	86%
Balance Measure			
Incidences of expired consumables used for care(n=)	0/ month	0/ month	0/ month

Reflections: The data changes through the years. Will still need to trend for a year but also work upstream.

3. Target State Go No Go

60% of expired consumables to be directly diverted away from landfills

6. Rapid Experiments Go No Go

Dashboard
EXPIRED ITEM DASHBOARD

Mini-education series
CLIMATE CHAN
CE Minute
A GREENER SUSTAINABLE HEALTHCARE

Reflections: A "failed" dashboard highlighted the importance of education and engagement with the ground to help them sense make information.

9. Insights Go No Go

What are the fundamental lessons of the event and the improvement cycle?

What went well?
Active participation from nurses through the mini-series.

What did not go well?
Initial Rapid Experiment (dashboard) was poorly received but gave the opportunity to pivot.

What helped?
Understanding different Personae, what gave them meaning, and what were their pain points

What hindered?
Lack of trust hindered the speed of buy-in.
Prior recycling projects of rummaging through bins helped to build trust through "leading by example"

Introduction



CNN World Africa Americas Asia Australia China Europe India Middle East United Kingdom Watch Listen Live TV

'Shocked' by the loss: Scientists sound the alarm on New Zealand's melting glaciers

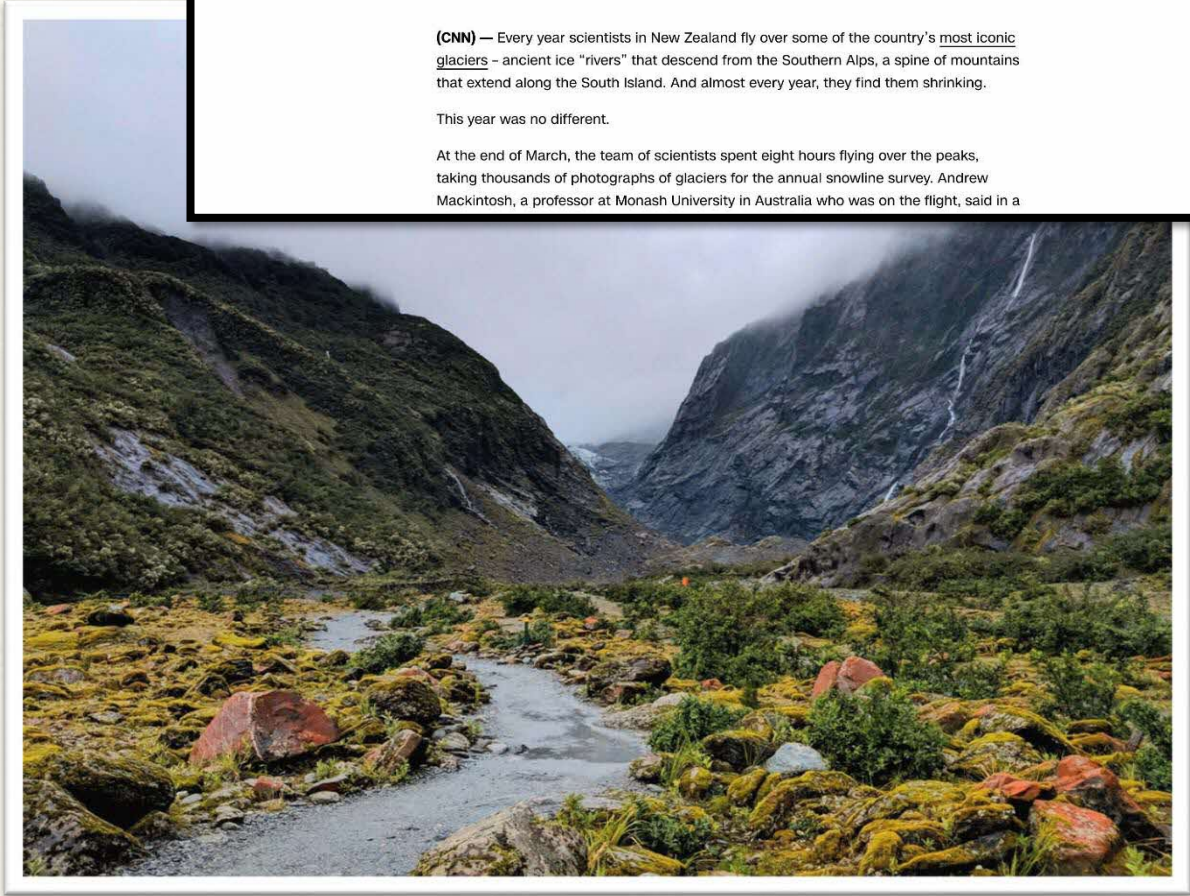
By Laura Paddison, CNN
5 minute read · Updated 9:18 AM EDT, Thu April 6, 2023

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(CNN) — Every year scientists in New Zealand fly over some of the country's most iconic glaciers — ancient ice "rivers" that descend from the Southern Alps, a spine of mountains that extend along the South Island. And almost every year, they find them shrinking.

This year was no different.

At the end of March, the team of scientists spent eight hours flying over the peaks, taking thousands of photographs of glaciers for the annual snowline survey. Andrew Mackintosh, a professor at Monash University in Australia who was on the flight, said in a



Introduction



AI generated photo (Canva)

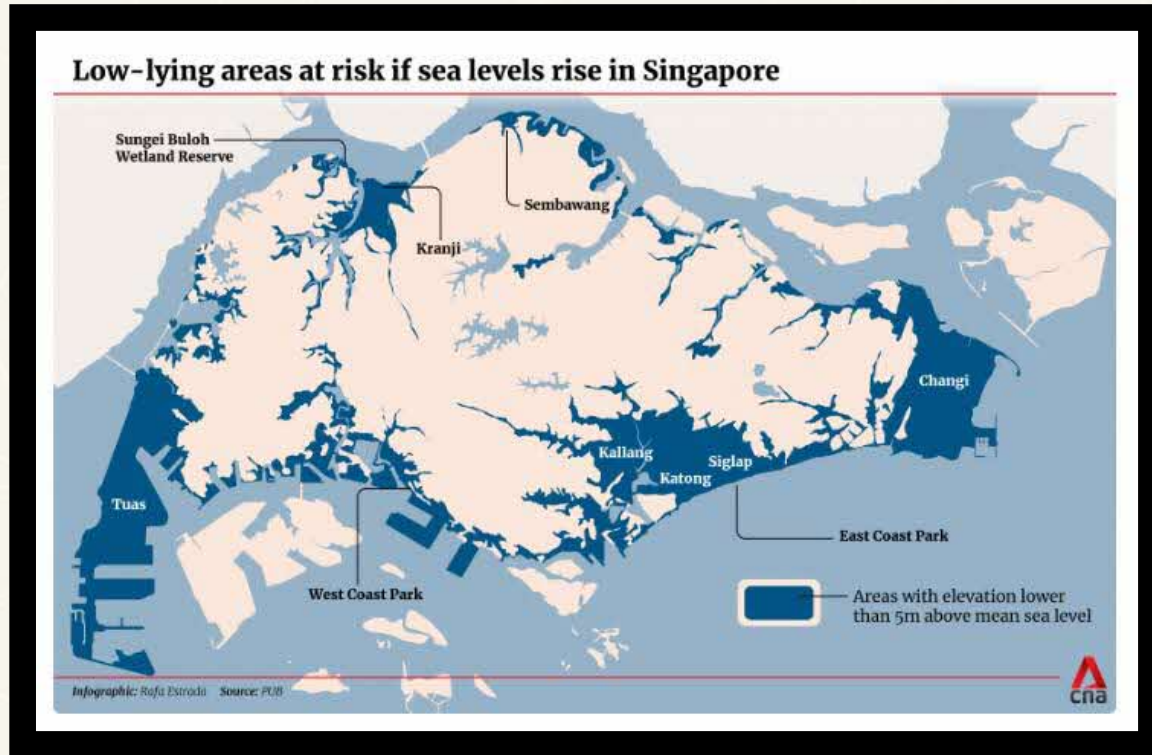


Photo from CNA



AI generated photo (Canva)

Background

By 2050, climate change is likely to cause an additional **14.5million deaths** worldwide. HealthCare systems are predicted to face an additional **\$1.1trillion USD burden** due to climate-induced impacts.

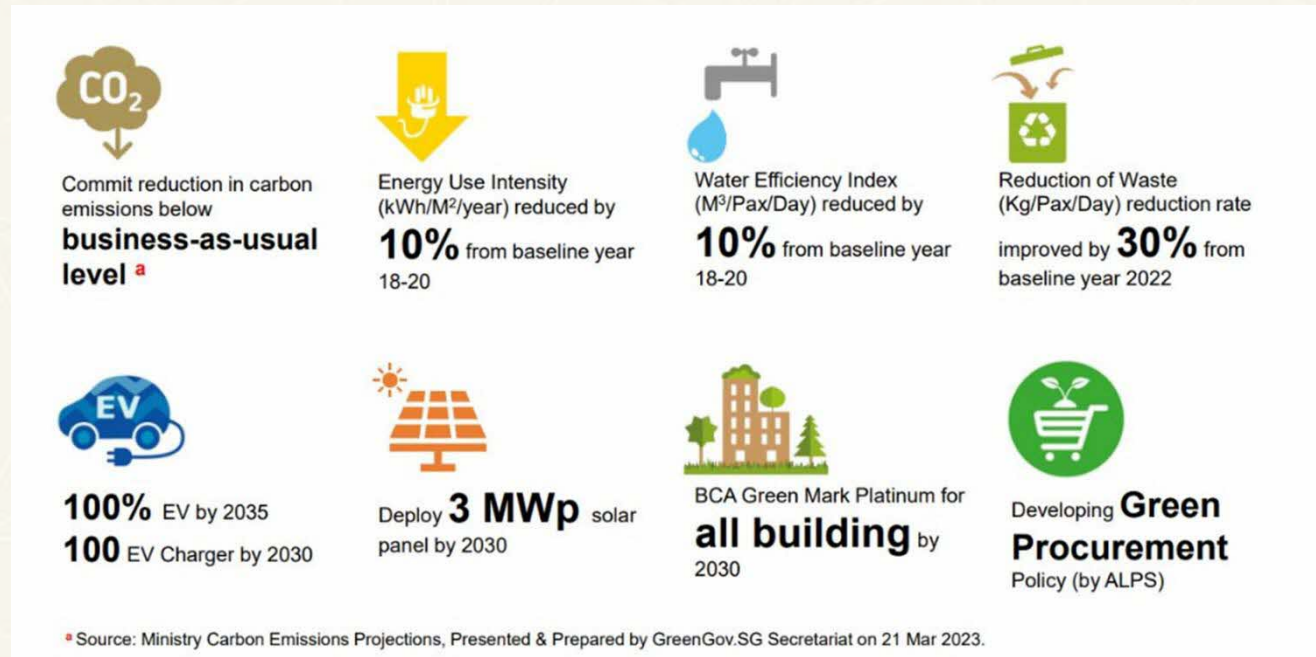
To meet and mitigate these new climate challenges will necessitate a comprehensive health system transformation and global collaborative efforts across multiple stakeholder groups and industries.

-World Economic Forum (2024). Quantifying the impact of climate change on human health.



Background

- Singapore is the top producer of single use plastic waste.
- Semakau Landfill's lifespan is getting shorter. It is expected to be fully filled by 2035.¹



Background

NCID is a 330 bedded purpose-built facility to protect Singapore from Infectious Diseases.

NCID has approximately 25,108¹ expired consumables annually. That translates to a loss of ~\$57,277.64¹, and carbon emissions of ~39.7 mtCO₂e^{1,2} annually .

- Expired consumables are MOSTLY discarded to general waste.
 - Training departments only take in specific consumables
 - Nurses do not know of other avenues, or have the time to redistribute
 - Existing recipients of expired consumables are finding it too much for their usage

Goals

Upstream

- Reduce expired consumables

Downstream

- **Ensure expired consumables are appropriately diverted away from landfills**



Value Proposition

- Strong impact beyond Novena campus, to other PHIs
- Sustainability Culture building through sharing of resources.
- Potential collaborators could be beyond Healthcare.
 - IHLS
 - Community



Guiding Principles: Downstream

- No expired consumables will be used in care processes

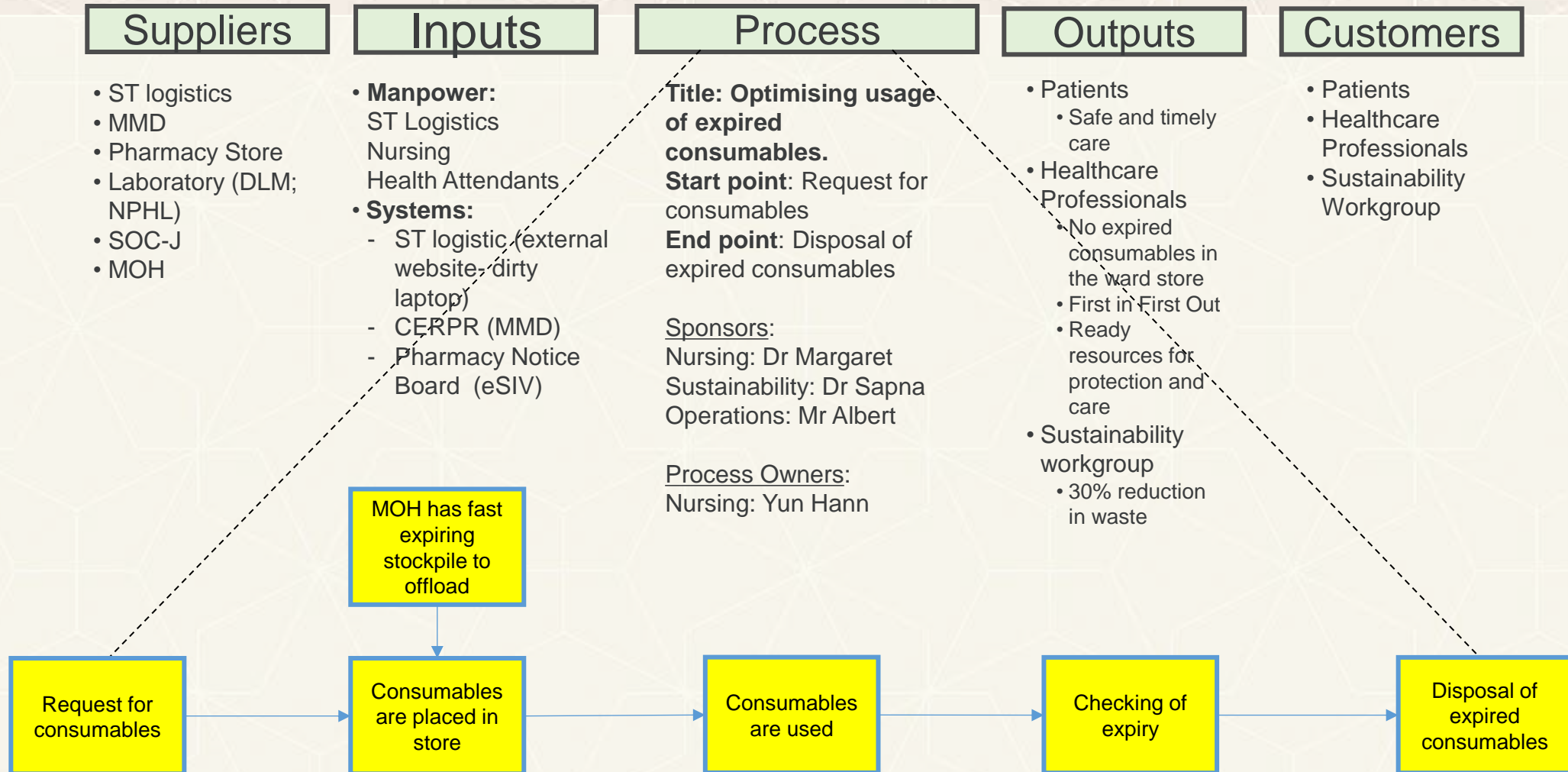


Box 1: Reason for Action

There is a large amount of expired consumables discarded as general waste, adding to the fast-filling landfill in Singapore.



SIPOC



Boxes 2-3: Initial & Target State

	Initial (Jul-Sept 24)	Target
Outcome Measure		
Expired consumables diverted	46%	60%
Balance Measure		
Incidences of expired consumables used for care(n=)	0/ month	0/ month

Measuring Impact

$$\text{Sustainable value} = \frac{\text{Outcomes for patients and populations}}{\text{Environmental + social + financial impacts (the 'triple bottom line')}}$$

- Clinical outcomes: Safe care for patients, no expired consumables in use during care processes
- Environmental: Reduce waste to landfills, decrease CO2e
- Social: Increase staff satisfaction through engagement and collaboration on sustainability movement; Increase staff awareness of environment sustainability
- Financial: Decrease financial cost of procurement of training materials, when expired resources when appropriately diverted

Box 4: Gap Analysis (Current State Process Map)

Environmental Cost:

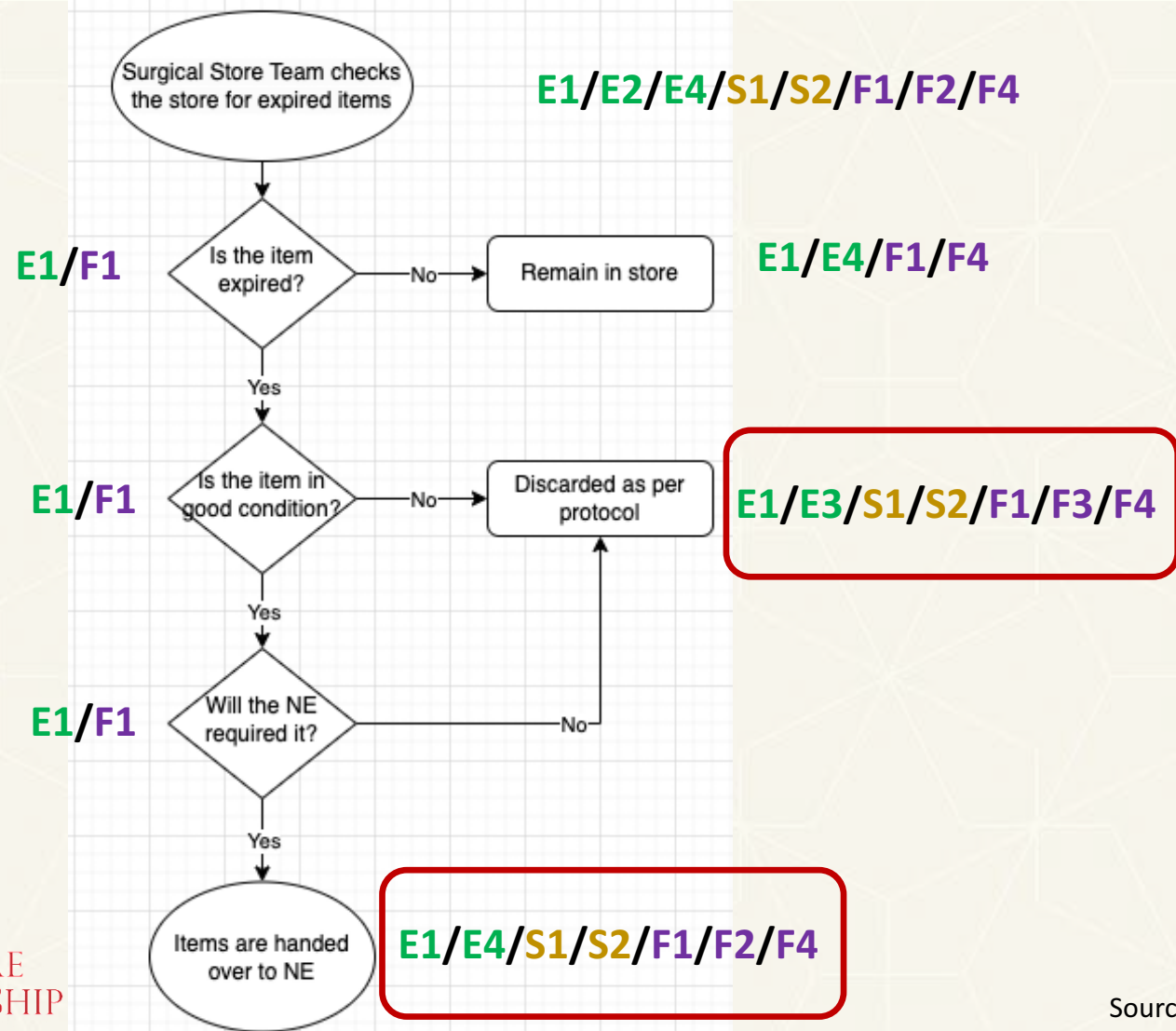
- E1: Medical supplies
- E2: Staff Travel
- E3: Waste disposal
- E4: Electricity usage

Social Cost:

- S1: Staff dissatisfaction
- S2: Staff wellbeing

Financial Cost:

- F1: Medical supplies
- F2: Electricity usage
- F3: Waste disposal
- F4: Staff time



Box 4: Gap Analysis (Persona)

We need to save the earth!



Empowered Elaine
“Early adopter”

Attitude: Positive

Pain Points: A lot of IPC restrains

Opportunities: How might we include Elaine in our efforts?

No time lah!



Busy Bella

“Bao Sua Bao Hai”

Attitude: Overwhelmed with work

Pain Points: Negative perception to more work

Opportunities: How might we make changes that are small but impactful?

Aiyo! Don't waste!



Frugal Florence

“Dark Horse”

Attitude: Finding alternative usage

Pain Points: Rigid on sticking with “old ways”

Opportunities: How might we leverage on Florence's frugal ways to find new usage?

Really meh?



Skeptical Sally

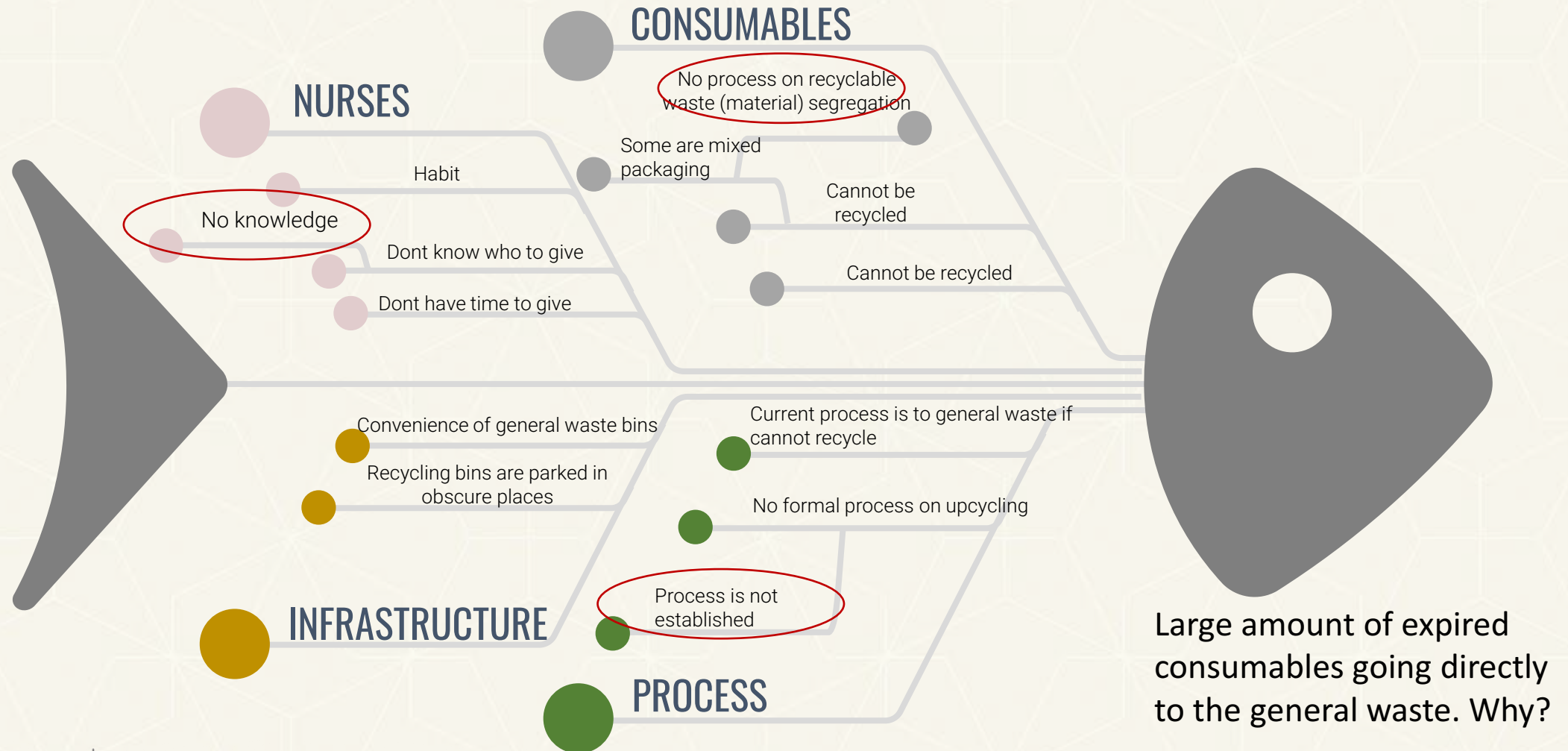
Laggard

Attitude: Skeptical on climate change and sustainability

Pain Points: Conspiracy theories

Opportunities: How might we encourage Sally to learn about climate change and its impact on health?

Box 4: Gap Analysis (Fishbone)



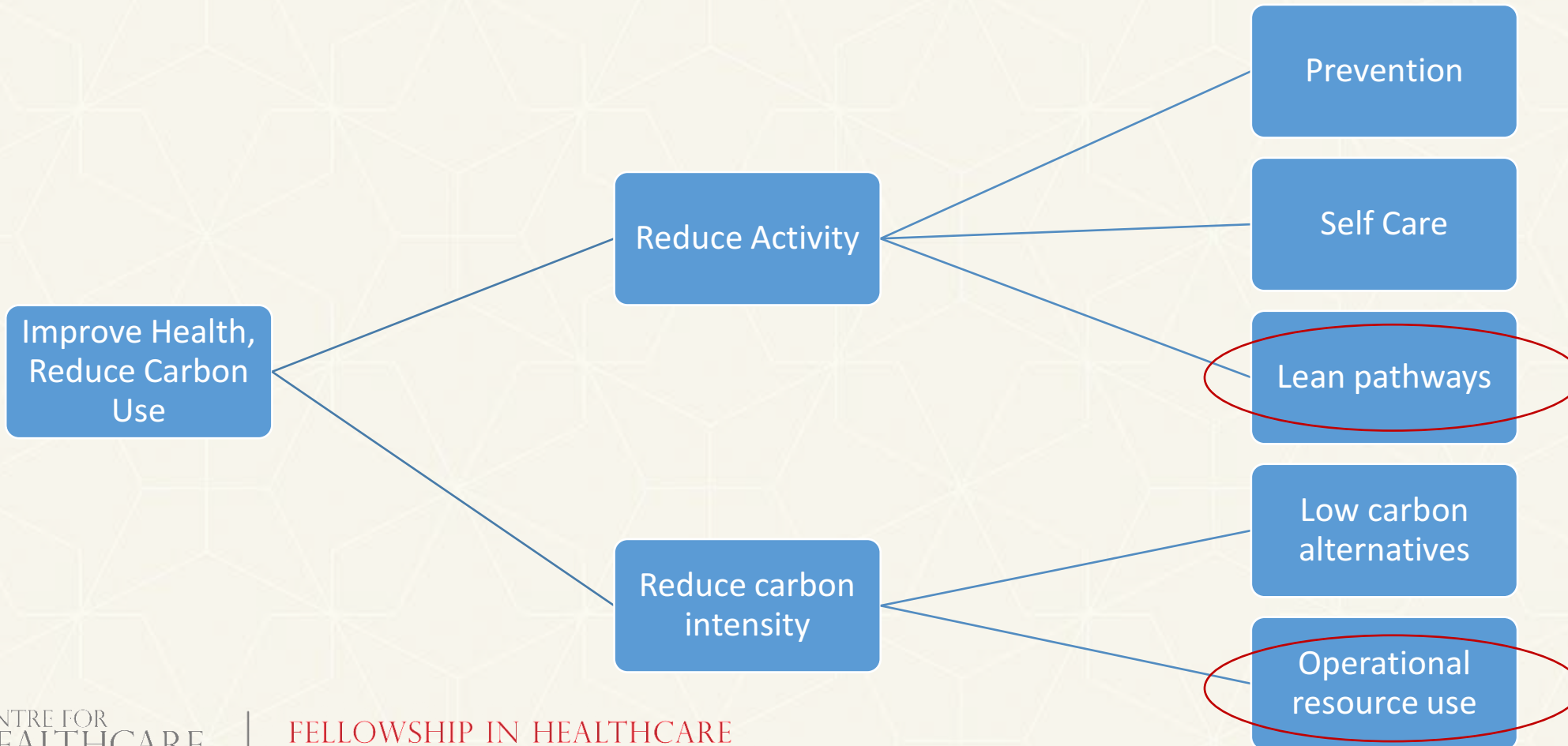
Large amount of expired consumables going directly to the general waste. Why?

Box 4: Gap Analysis (Driver Diagram)

Outcome needed

Primary Driver

Secondary Driver



Box 4: Gap Analysis (Current State Process Map)

Environmental Resources:

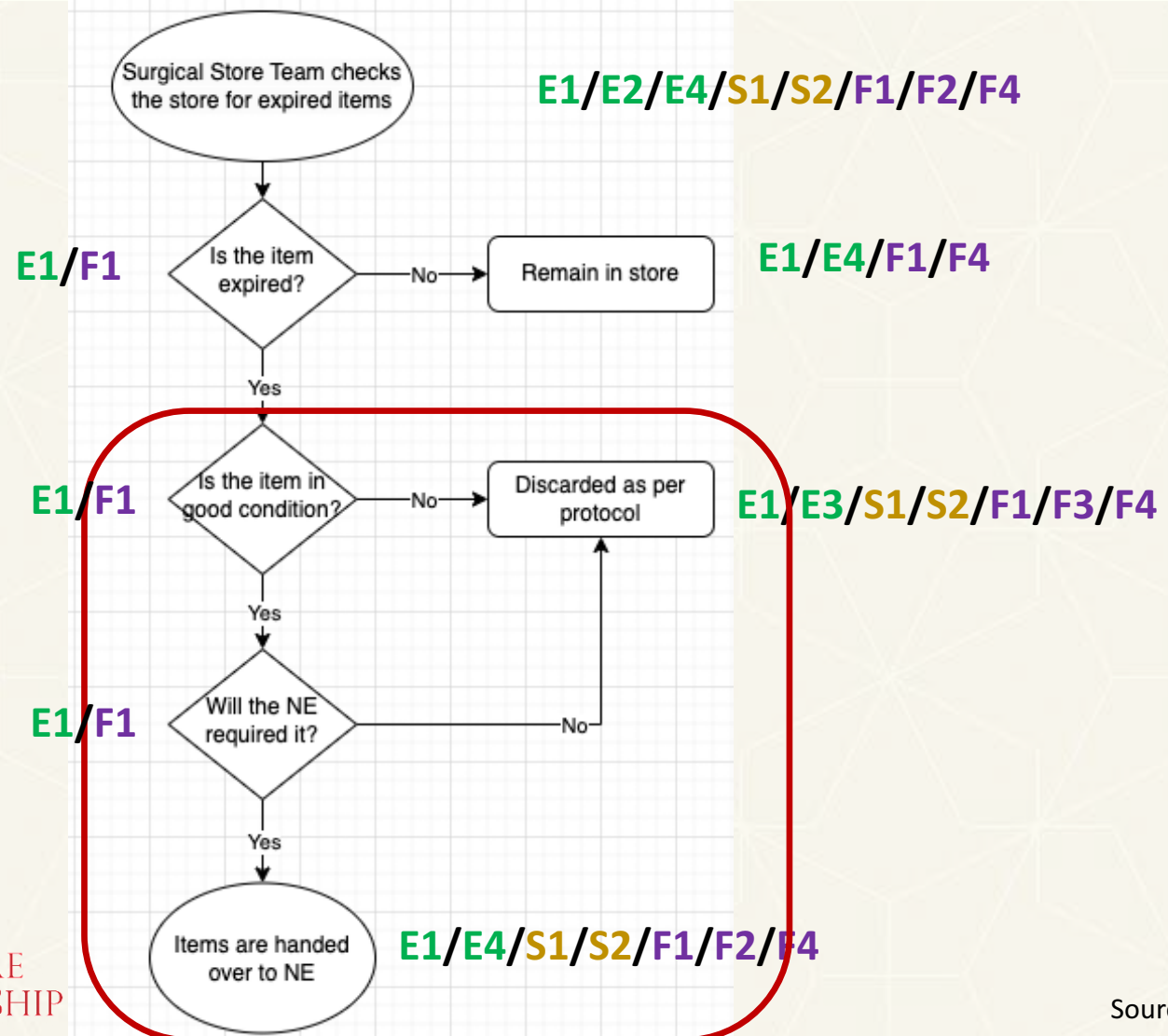
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Social Resources:

- S1: Staff satisfaction
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Financial Resources:

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Box 5: Solution Approach

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Sharing of resources:



- Transfer of carbon savings by donating expired consumables to receiving institutions



“Not just a student” programme:

- Reduce transportation carbon footprint and cost

GOVERNANCE

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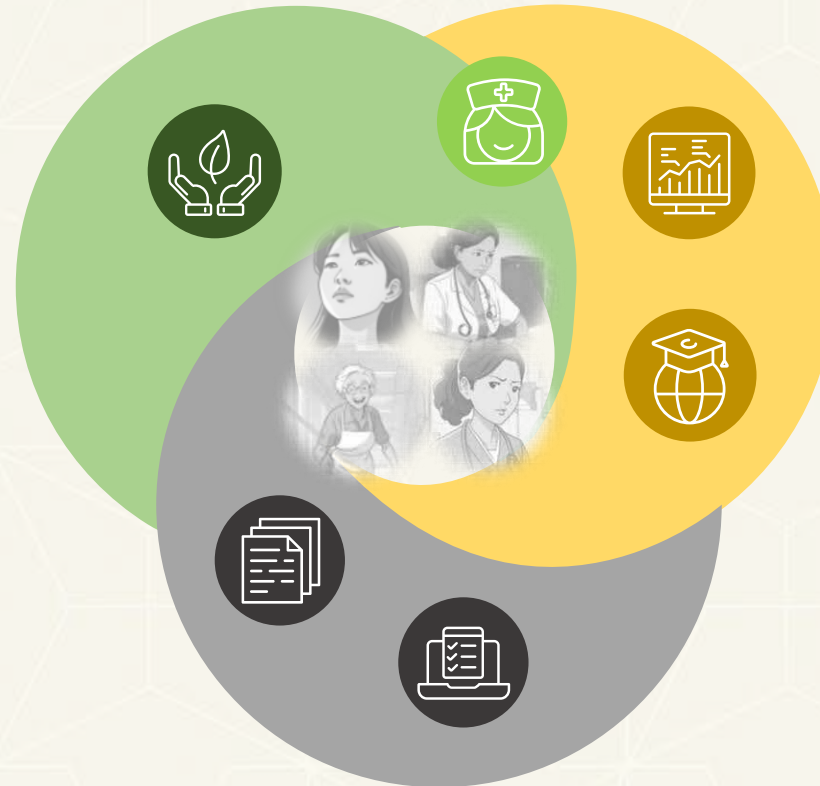


- Establish a policy for expired consumables management

Protocol:



- Algorithm (RPA) to prioritise diversion



SOCIAL

Monthly dashboard:



- Raise staff awareness of initiatives to influence ordering patterns



“Not just a student” programme:

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Education:

- Raise the awareness of climate change on health.

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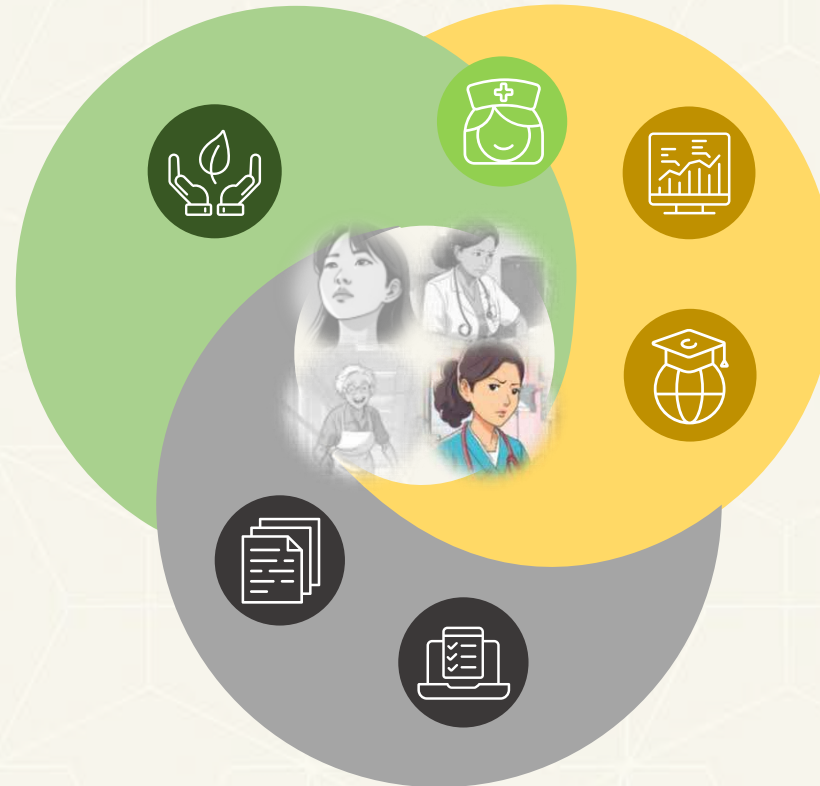


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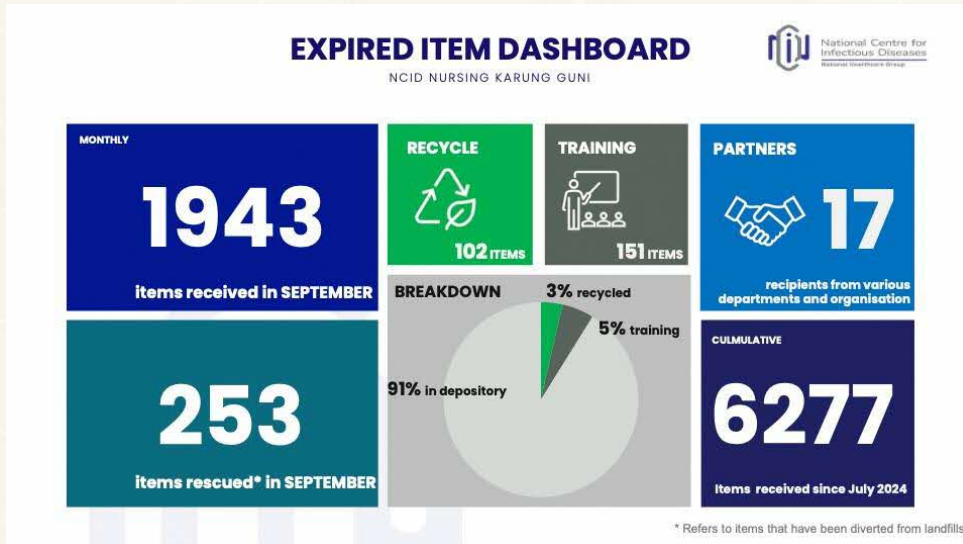


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Box 6: Rapid Experiment: Monthly Dashboard

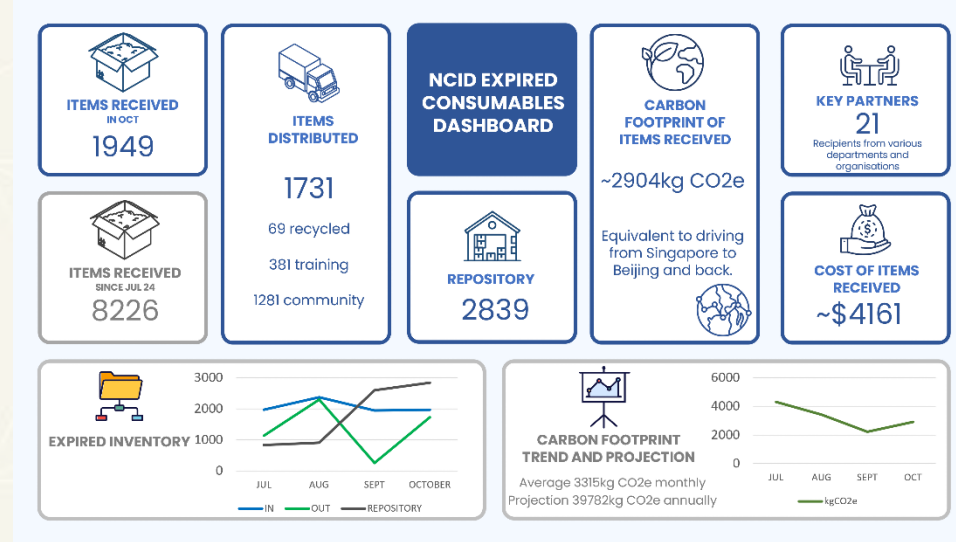
Version 1



Feedback:

- Unable to see a trend
- The data does not tell a “story”

Version 2: Addition of carbon footprint





Feedback:

- Too many numbers
- What is carbon footprint?

Failed RIE?

Box 4: Gap Analysis (Current Education Plans)

Current Strategy:

- Visual cues 
- Infographia/ EDMS 

Gap:

The Busy Bella will not have time to see, the Skeptical Sally may remain Skeptical.



To raise awareness on Proper Waste Segregation

- First Target Audience: Staff, Second Target Audience: Public

Ideation/methods:

- Re-vamping of signages and mascot 
- EDMs through social channels (Email and Workplace) 
- Events and Activities (Earth Day 2025)
- Visual friendly recycling bins 
- Engaging vendors to learn more about recyclable materials
- Communication script on recyclable waste contamination for housekeeping operatives
- Encourage Zero Waste behaviour



Box 5: Solution Approach

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Mini-series Inservice Talks:

- Raise the awareness of climate change on health.

Kirkpatrick Model of Evaluation

RESULTS

What are the benefits experienced?

IMPACT

Did the training lead to changes in behavior in the real world?



LEARNING

What did the participants learn, in applicable skills and knowledge

REACTION

How did participants react?
Was the training valuable?

Miniseries In-service Talks on Sustainability

To pilot and 3-part miniseries on in-service talks (10mins) in 2 wards



Content:

Demonstrate how healthcare is a huge contributor to waste

Objective:

Elicit a negative feeling on healthcare's contribution to the climate crisis



Content:

Share information on the climate crisis, how Singapore and the Healthcare industry is a huge contributor.

Objective:

Provide information to nurses on why we need to take action



Content:

Share NCID and Campus initiatives and plans

Objective:

Inspire nurses to take small actions to contribute to our goal (10:10:30)

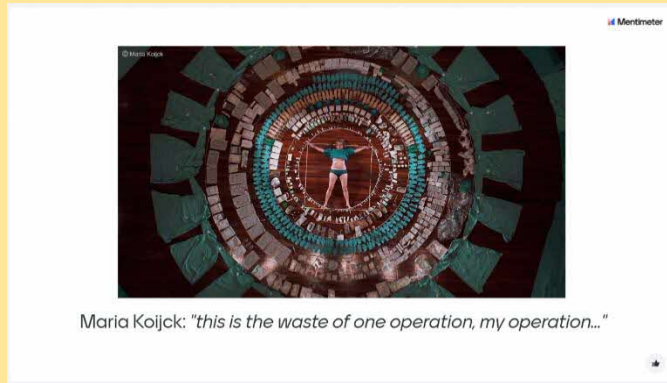
REACTION

LEARNING

IMPACT

Photos Source: AI generated (Canva)

Miniseries In-service Talks on Sustainability



REACTION



LEARNING



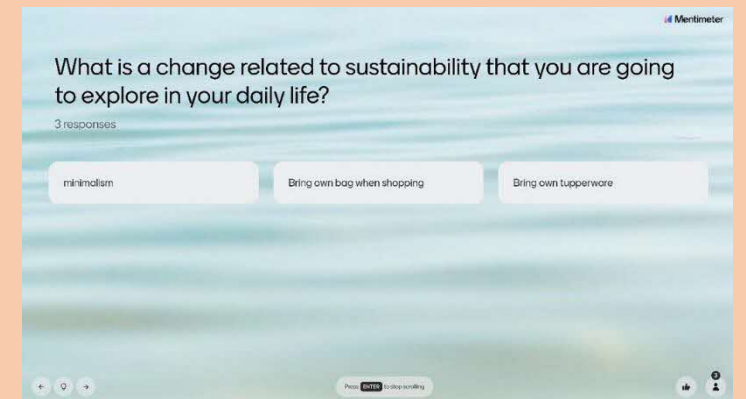
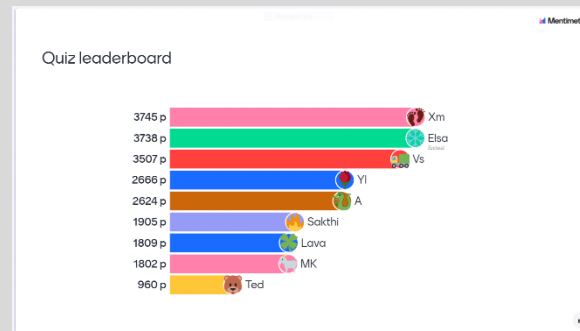
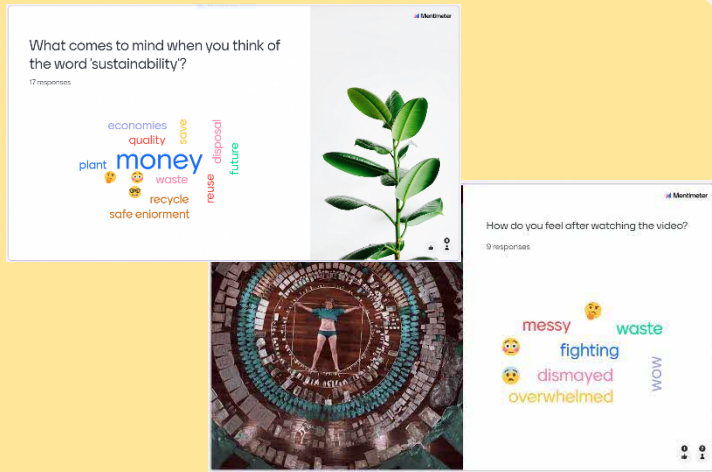
IMPACT

**RESULTS
IMPACT
LEARNING
REACTION**



Miniseries In-service Talks on Sustainability

Insights



REACTION

LEARNING

IMPACT

RESULTS
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Box 7: Completion Plan

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DECEMBER 24	2	Delivery of miniseries (part 2) to 2 wards	Completed
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JANUARY 25	2-3	Analysis on effectiveness.	In Progress
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Box 8: Confirmed State

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Box 9: Insights

What went well?

Active participation from nurses.

What did not go well?

Initial Rapid Experiment (dashboard) was poorly received but gave the opportunity to pivot.

What helped?

Understanding different personas. What gave them meaning and what were their pain points.

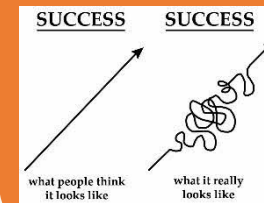
What hindered

Lack of trust hindered the buy-in.

What went well?



What did not do well?



What helped?



What hindered?

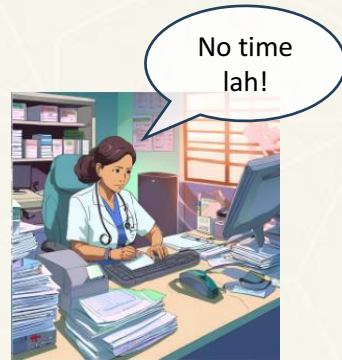
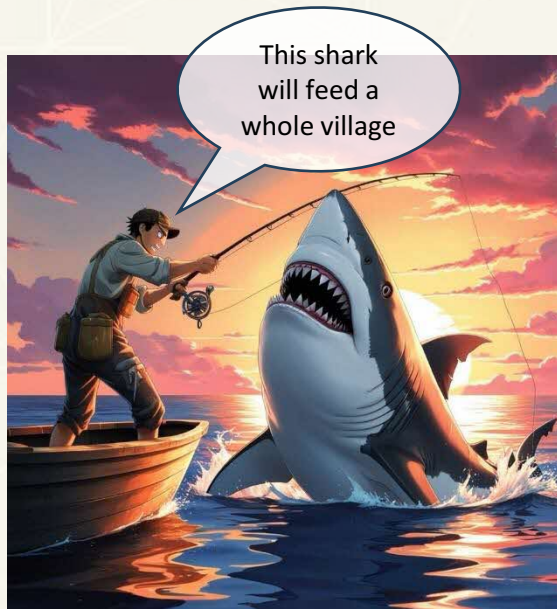


Box 9: Insights



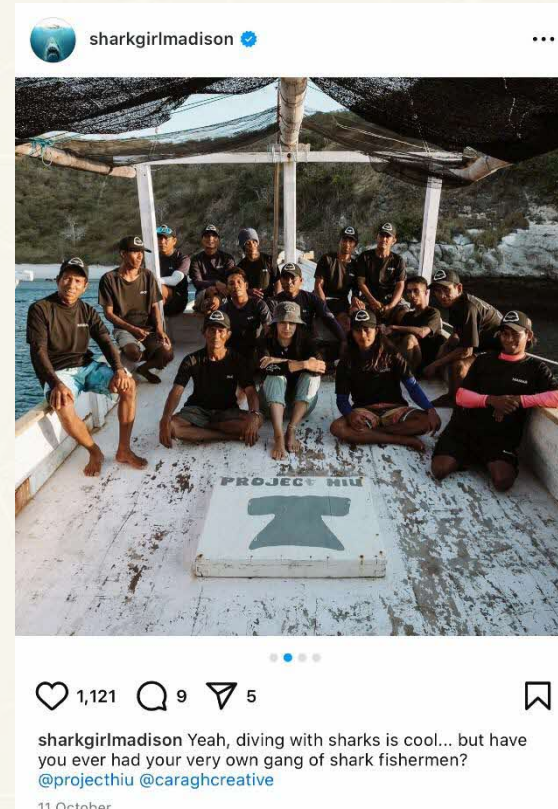
Madison Stewart is the founder of Project Hiu:

“Mission to repurpose a fleet of shark fishing vessels by providing alternative income through tourism”



Photos Source: AI generated (Canva)

“We will not feed a village by killing a shark, we feed a village by not preying on the ... apex predators...”



“We fail in conservation when we decide who a person is without examining their life.”

7 boats, 2000 sharks saved

THANK YOU