



PROBLEM-BASED LEARNING LOW CARBON SOCIETY

HYDROPOWER

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**SMK SERI KOTA PUTERI 2
JOHOR, MALAYSIA**

The Importance of Low Carbon Society

1. To improve health and lifestyle

GENDER	CAUSE OF DEATH IN A YEAR (Malaysia)	YEAR 2015 (NUMBER OF CASES)	YEAR 2016 (NUMBER OF CASES)
MALES	Ischaemic Heart Disease	7 691	8 033 ↑
FEMALES	Pneumonia	4 396	4 637 ↑

Source: Department of Statistic Malaysia, 2015

The Importance of Low Carbon Society

2. To increase energy efficiency

BENEFITS OF ENERGY EFFICIENCY	YEAR 2016 TO YEAR 2030 (Estimated Data)
1. Save hours of electricity	925 M MW
2. Save energy cost	48 Billion USD
3. Support jobs	611,000 jobs
4. Create jobs opportunity	6.2 M jobs

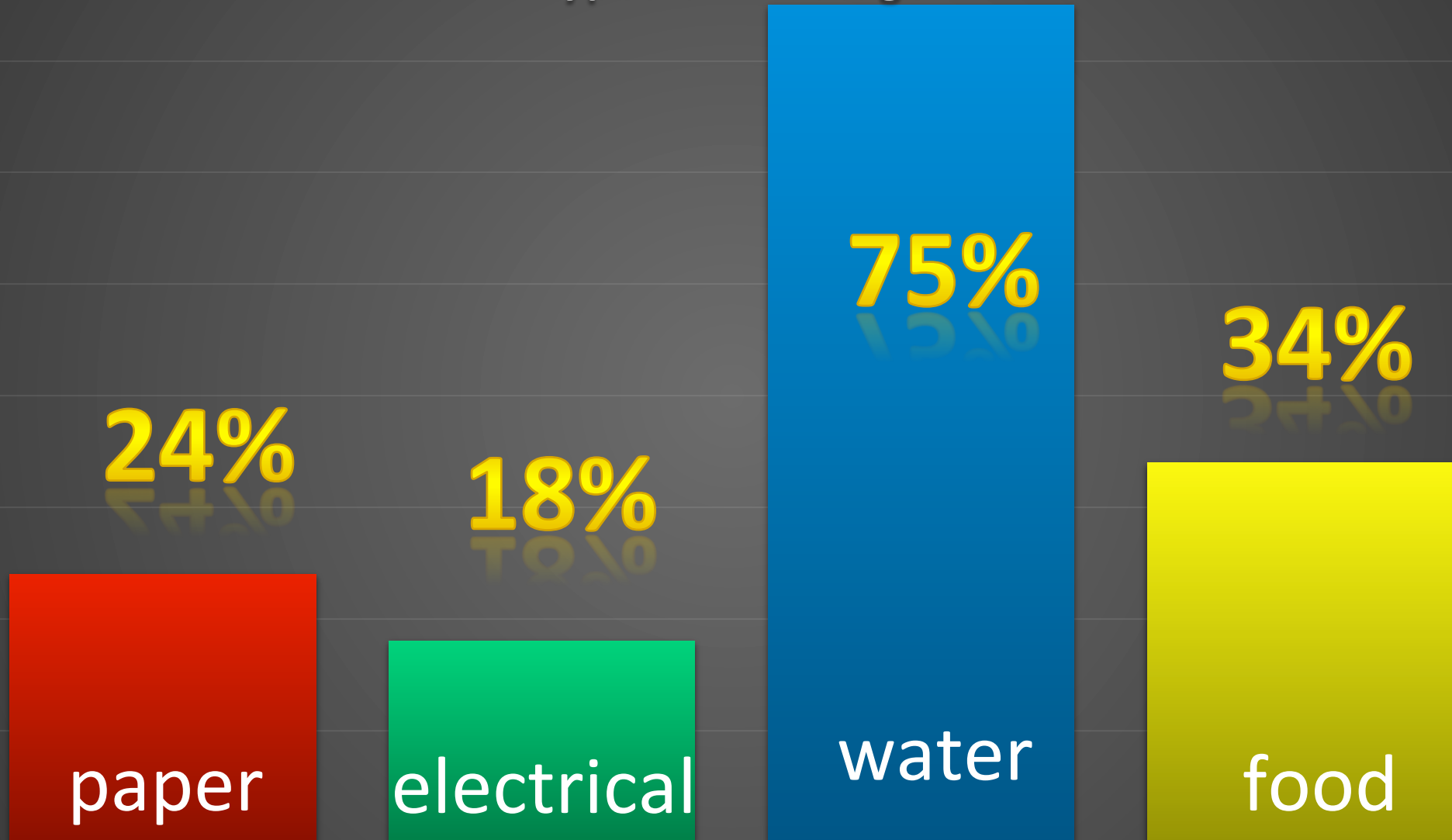
Source: American Council for an Energy-Efficient Economy Report, 2016



CASE STUDY

Findings From the Questionnaire

Types of Wastage



Water Wastage

LOCATION: SCHOOL CANTEEN

1. Year Operated	<ul style="list-style-type: none">• 2003 until now
2. Facility available	<ul style="list-style-type: none">• 11 sinks<ul style="list-style-type: none">-3 sinks for teachers-6 sinks for students-2 sinks for the canteen operator
3. Break Time	<ul style="list-style-type: none">• Session 1 (10.10 am – 10.30 am)• Session 2 (10.50 am – 11.10 am) 20 min per session = 40 min/day

PROBLEM STATEMENT



3 SINKS FOR STUDENTS



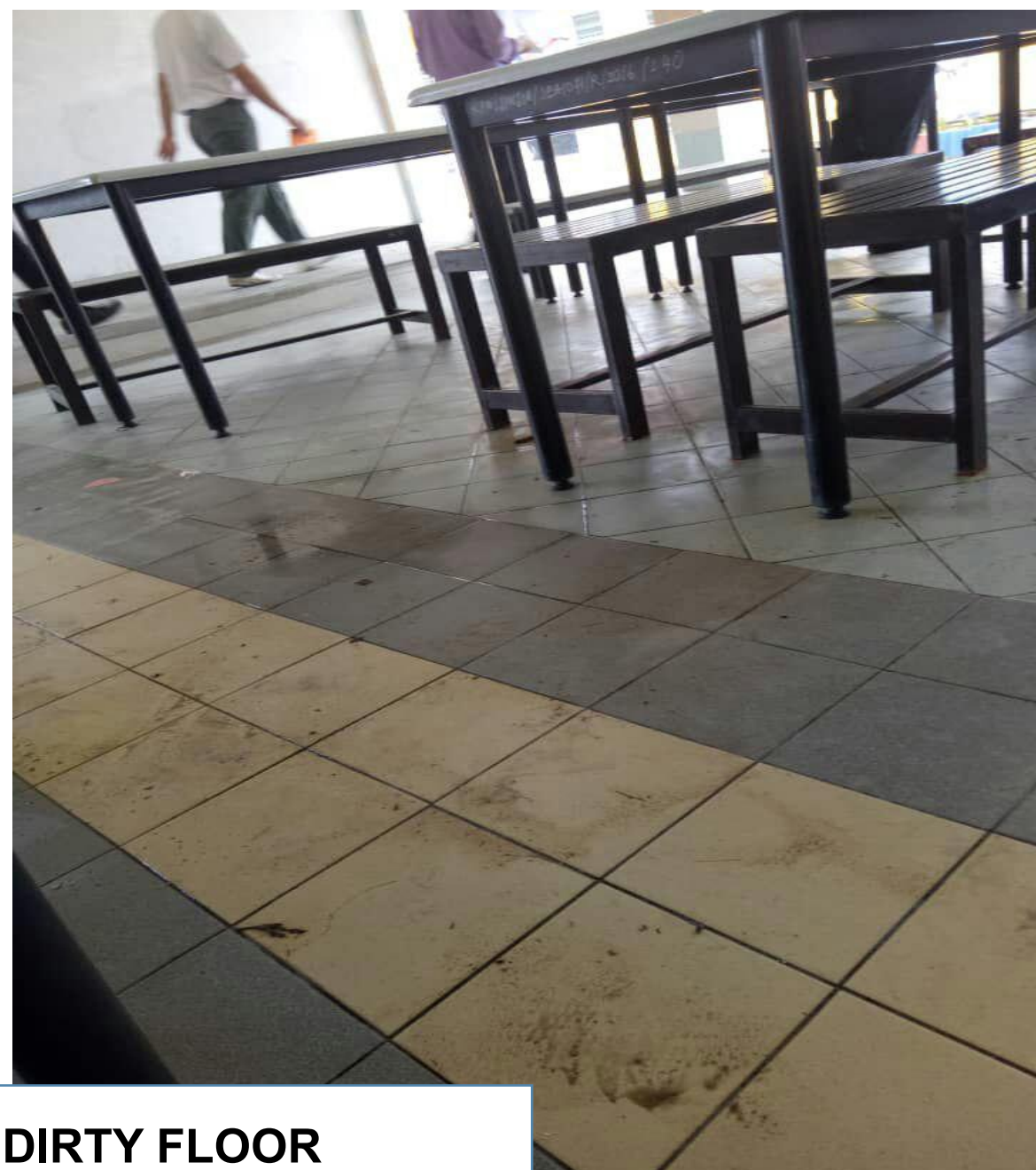
SCHOOL CANTEEN



2 SINKS FOR STUDENTS

WHEN STUDENTS WASHED THEIR HANDS, A LOT OF WATER WAS WASTED





WET AND DIRTY FLOOR

RESEARCH METHODOLOGY

4

Develop Hydropower Prototype : Hydroponics and Microfiltration

Water Treatment System

- Design and Technology syllabus
- Filters and aquarium
- Watering plants

3

Proposed Solution: Location, School Canteen

- Clean hands
- Lack of awareness and responsibility
- Water can be recycle : Plants in the pavements

2

Data Collection: Questionnaire and Interview

- 150 students
- Hindrance to achieve LCS in SMKSKP 2
- Water wastage: School Canteen

1

Observation

- Types of wastage in school

RESEARCH OBJECTIVES

To **reduce** the issue of water wastage.

To **increase awareness and responsibility** among students about the importance of water conservation.

To **embrace the practices of green living** among students and teachers.

PROPOSED SOLUTION

Hydropower (Concept Design)

Flower plants



Water Dropper

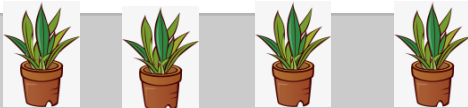


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Hydroponic System

Lemon Grass

4



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Cat Fish Tank

PVC Pipe

Microfiltration Water Treatment Principle

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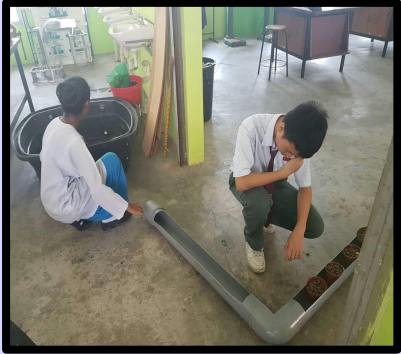


Charcoal Banana Skin

1

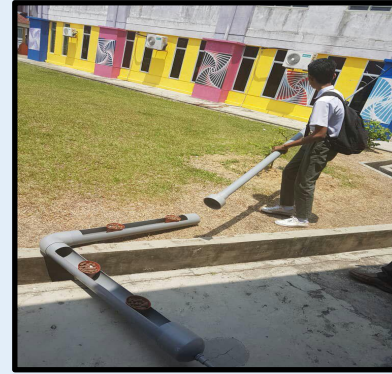


The Development of Hydropower Prototype



Measurement and initial work

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Fish tank is attached with PVC pipe



Placing the filter under the sink

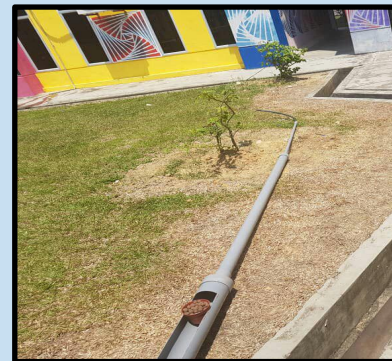
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A water dropper is attached to water the plants at the canteen area



Channel water from filter to a fish tank



Hydropower Cost

MATERIALS	PRICE	NOTE
1. PVC Pipes	RM 78	Sponsored by Vice Principal
2. Overflow fittings	RM 6.80	Parents & Teachers Association
3. Aquarium	-	Donated by community
4. Catfish	-	Sponsored by community
5. Lemon grass	RM 18.00	Parents & Teachers Association
6. Pipe Hose	RM 32.00	Parents & Teachers Association
7. Banana Skin	-	Donated by community
8. Charcoal	RM 12.00	Parents & Teachers Association
9. Filter tank	-	Donated by community
10. Hydrotens	-	Used Hydrotens by the form 2 students project work
11. Small pots	RM10	Parents & Teachers Association
TOTAL	RM 156.80 (4200) ¥	Parents & Teachers Association

The Advantages of Hydropower System



Post-Test Among Students on LCS Awareness

Question	Conclusion
1.What is the meaning of Low Carbon Society?	Students understand the meaning of the Low Carbon Society. -The communities collaborate to reduce CO ₂ in their daily activities.
2.What are the hindrance in achieving this life style?	Students are able to relate the activities that causes the hike in CO ₂
3.What do you understand about the Hydropower Project at the school canteen?	Students understand the main concept of reusing water, water filtration and aquaphonics system.

Limitations of Hydropower System



- ✓ Maintenance during school holidays.
- ✓ Curious students disturb the fish & filtration system.

FUTURE RECOMMENDATION



- Campaign and talk about LCS
- Instructions are attached above the sink
 - Get help from gardener



CONCLUSION

Hopefully with the proposed solution, many will realise that if we use water properly, we will contribute to LCS.