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Growth and Recognition of IPI

Prof.Dr.S.Radhakrishnan President IPI



Vision and Mission

- ❖ IPI has grown over the past ten years: from 10 chapters in 2011 to 16 chapters in 2021; Two collaborations with Sri Lanka and Nepal; 5 students chapters in 2010 to 22 students chapters in 2021, total membership is going to 2930. This is excellent.
- However, IPI has currently India centric activities with members from different chapters contributing to these events
- ❖ IPI has to grow further and spread to other countries via joint activities with institutes, universities, industries and social groups
- ❖ IPI has to be involved in policy decision making
- ❖ IPI Journal should become internationally recognized with high technical contents and citations in Google Scholar.
- There should be some visible gain for the members by attending and participating in IPI meetings

Action Plan



- Organize International Conference in collaboration with other institutes within and outside India. For example, Prof.Sabu Thomas, MG University is ready to collaborate. IPI Kochi chapter can get involved. MIT WPU is now in discussion with U Mass Lowell for collaborative research, Nextek UK and University of Greenwich have association with MIT WPU
- ❖ IPI should hold every month Academia Industry Meet (AIM). This meeting will be unique in its content. Industry will pose questions/ problems to Academicians with a prize tag. (Like KBC) Rs.500 to Rs.5000 depending on the depth and complications involved. This will give opportunity to Industry to solve their problems (related to Material, Processing, Testing etc.) and the Academicians will not feel that they are giving "free consultancy". Solutions to the posed questions will be judged by the results in the industry. Payment will be locked with IPI who will release 50% to the solution provider after completion.
- Every Chapter can have AIM in each month. This can be publicized in advance.
- MIT-WPU plans to organize a Certificate Course in Plastics For Packaging Application
- IPI Journal is getting recognition slowly on Google Scholar (via citations of Dr.SR) We need to register with CrossRef so as to get a DOI number for the articles. This will boost the image of IPI Journal and also academicians will be ready to submit high quality technical papers



Action Plan

WHAT TO DO ABOUT COVID LIKE SITUATION IN PLASTIC POLLUTION





Plastic Pollution and Covid Pandemic

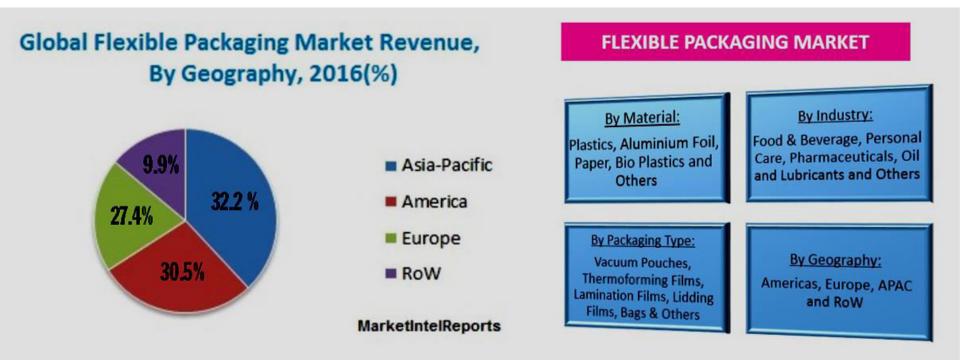
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FLEXIBLE PACKAGING : MARKET IS EVER GROWING





Flexible Packaging Market projected to exceed \$250 billion by 2024



PLASTICS PACKAGING



Total converter demand 51.2 m t





FLEXIBLE PLASTIC PACKAGING:



MULTILAYER FILMS
STRECH WRAP/ SHRINK WRAP
METAL COATED FOILS
PAPER LAMINATES
BOPP FILMS

FOOD PACKAGING
AGRI-BASED: GRAINS
FRUITS & VEGETABLES
DRY EDIBLES
OIL, MILK

MEDICALS
CLEANING AGENTS

ELECTRONICS
COMPONENTS
WIRE AND CABLE

TEXTILES GARMENTS

AUTO PARTS
MACHINE PARTS
TOYS

HOODS SHROUDS SPORTS GOODS





PLASTICS USAGE



GOOD











BAD









UGLY



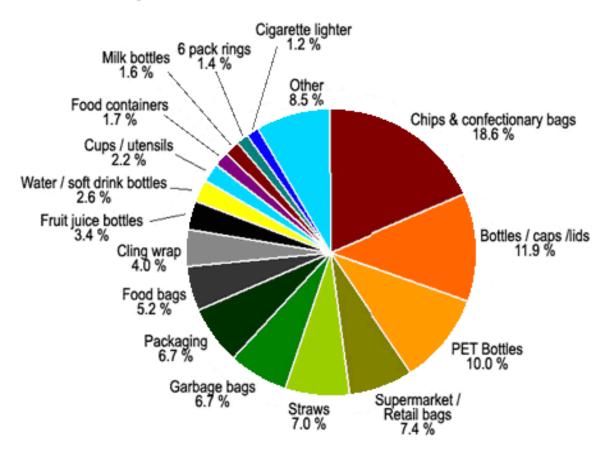




Production of plastic waste



- •500 billion plastic bags are used per day world wide.
- Plastic waste generated in India: 15,342 tones/day
- Plastic waste generated in India/ Annum: 5.6 Million tones.





PANDEMIC AND PLASTICS WASTE



PLASTIC POLLUTION VIRUS (PPV) HIT THE WORLD BEFORE COVID-19

ALL ENIRONMENTALISTS, CELEBRATIES, SOCIAL MEDIA, TV CHANNELS, PLASTIC INDUSTRY, SCIENTISTS, RESEARCHERS AND EVERYONE WERE AFFECTED BY THIS PPV

ALL TYPES OF INFORMATIONS WERE FLOATED AROUND AND GREAT PANIC CREATED

SITUATION BECAME ALARMING

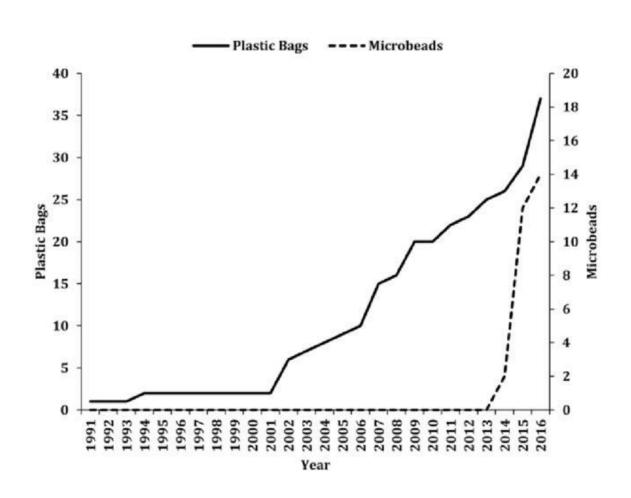
LOCKDOWN WAS IMPOSED: BAN ON PLASTICS!!!

LOCKDOWN DID NOT HELP MUCH IN DECREASING COVID CASES BUT ONLY POSTPONED THE PEAK

PLASTIC BAN DID NOT HAVE MUCH EFFECT ON PPV



PANDEMIC LIKE SITUATION IN PP-V



PLASTIC BAG CONSUMPTION PER CAPITA IS RISING

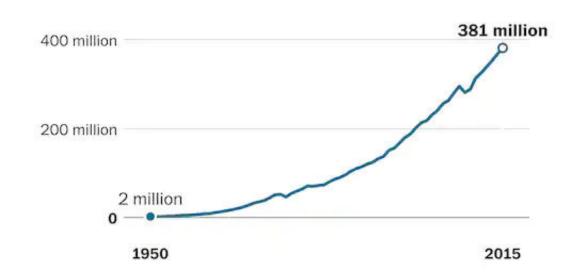
MICRO-BEADS RISING TREMENDOUSLY



PANDEMIC LIKE SITUATION IN PP-V

Global plastic pollution

Between 1950 and 2015, annual global polymer resin and fiber production (measured in million metric tons) increased almost every year.



PLASTIC BAG CONSUMPTION PER CAPITA IS RISING

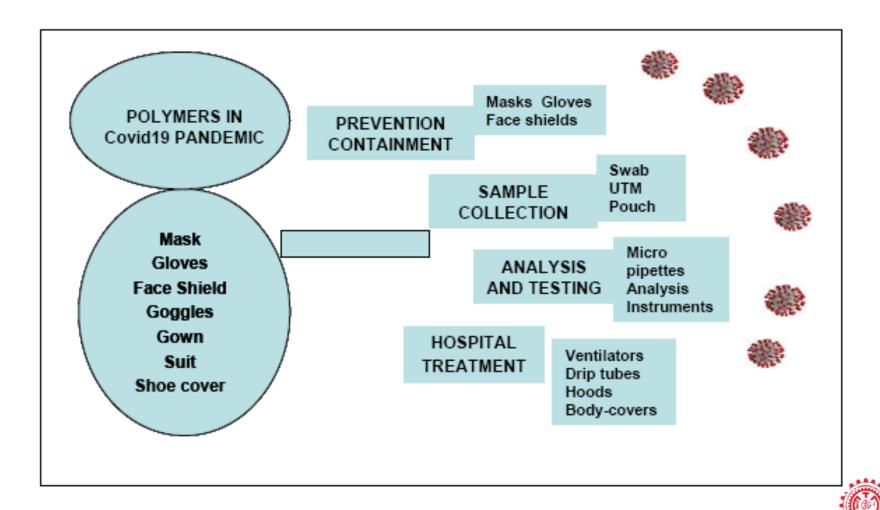
MICRO-BEADS RISING TREMENDOUSLY

Source: R. Geyer, J. R. Jambeck, K. L. Law

THE WASHINGTON POST

INCREASE OF PLASTIC USAGE LEADING TO MORE WASTE IN COVID PANDEMIC:



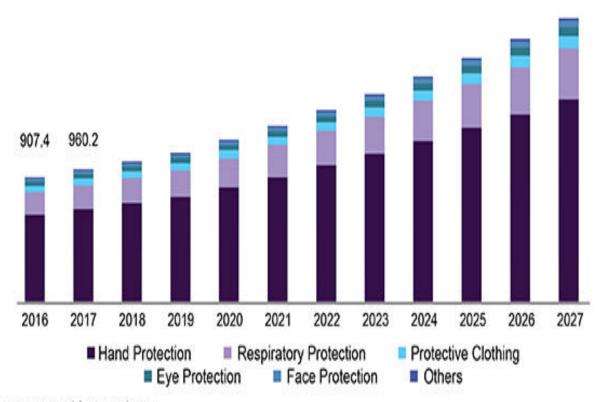


INCREASE OF PLASTIC USE AND ITS WASTE IN COVID PANDEMIC:





U.S. healthcare personal protective equipment market size, by product, 2016 - 2027 (USD Million)



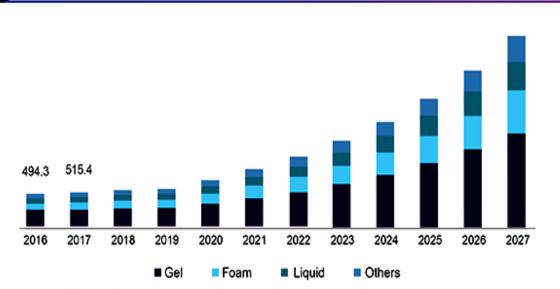




INCREASE OF PLASTIC USE AND ITS WASTE IN COVID PANDEMIC:



U.S. hand sanitizer market size, by product, 2016 - 2027 (USD Million)





Source: www.grandviewresearch.com

INCREASE IN HAND SANITIZER USAGE WILL LEAD TO INCREASE OF PLASTIC BOTTLES IN WASTE BINS



PANDEMIC LIKE SITUATION IN PP-V



THERE ARE MANY STUDIES AND EFFORTS MADE IN RECENT YEARS TO REDUCE PP-V:

- **❖ BAN ON PLASTIC BAGS, SINGLE USE PLASTICS**
- RECYCLING AND REUSE
- CONVERT PLASTICS WASTE TO FUEL
- ❖ RECOVER MONOMERS FROM PLASTICS LIKE PET
- ❖ INCINERATE PLASTIC WASTE FOR ENERGY
- **❖ BIOCOMPOSTABLE PLASTICS**
- ❖ ALTERNATIVE MATERIALS INSTEAD OF PLASTICS

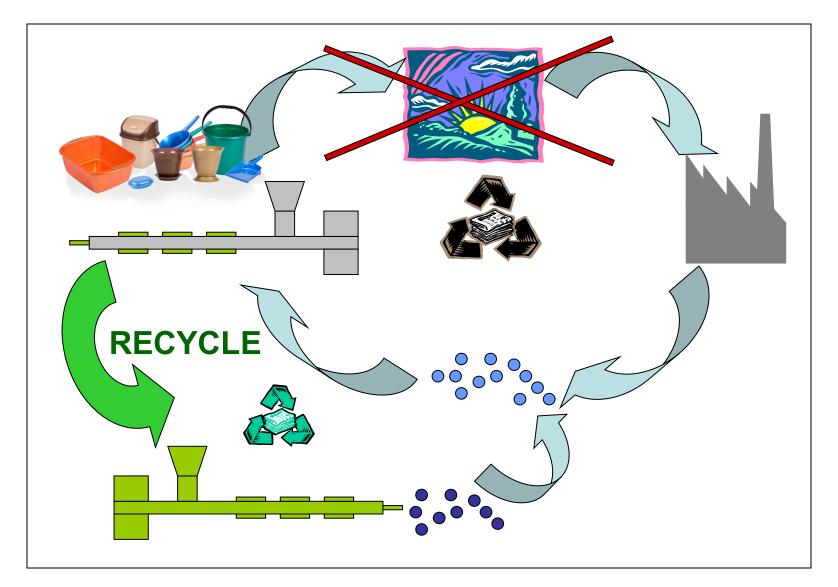
HOWEVER RECENT STUDIES PUBLISHED INDICATE

Predicted growth in plastic waste exceeds efforts to mitigate plastic pollution Science 18 Sep 2020: Vol. 369, Issue 6510, pp. 1515-1518



RECYCLING IS THE KEY TO MINIMISE PLASTICS WASTE IN ENVIRONMENT







RECYCLING PLASTIC PACKAGING (EU)

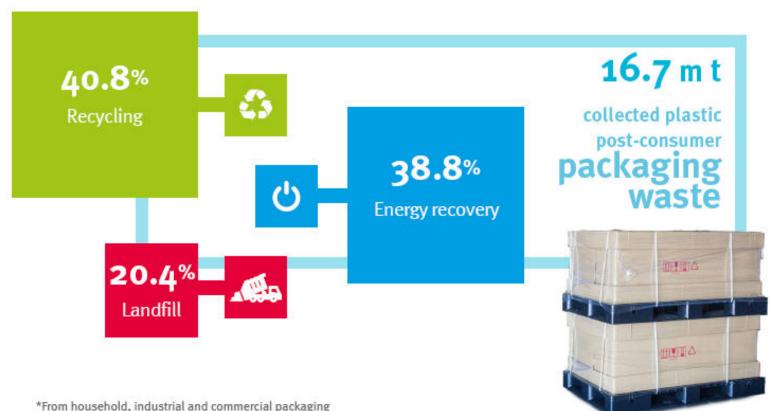


Recycling is the first option for plastic packaging waste

In 2016, 16.7 million tonnes of plastic packaging waste were collected through official schemes in order to be treated.

Source: Conversio Market & Strategy GmbH

Plastic PACKAGING* waste treatment in 2016 (EU28+NO/CH)

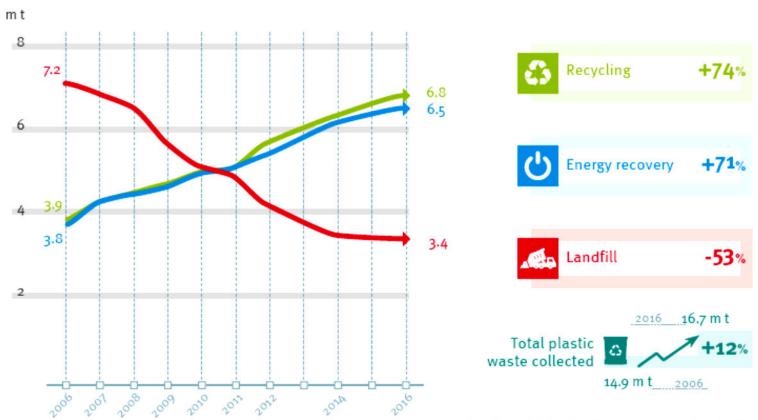




RECYCLING PLASTIC PACKAGING (EU)



2006-2016 evolution of plastic PACKAGING* waste treatment (EU28+NO/CH)



*From household, industrial and commercial packaging





RECYCLING AND CONVERSION CAN BE USEFUL AT DIFFERENT STAGES:



HIGH QUALITY VIRGIN GRADE

FOOD, MEDICAL, HQ PRODUCTS



I - STAGE RECYCLING FILMS FOR GENERAL PACKAGING, OFFICE PRODUCTS ETC.



II - STAGE RECYCLING PALLETS, CRATES, CHAIRS ETC.



III - STAGE RECYCLING FLOWER POTS, DECORATIVE ITEMS ETC.



ROAD FILL





RECYCLED PLASTICS GOODS USING MIXED PLASTIC WASTE:

MIXED PLASTIC WASTE WAS GRANULATED

LLDPE POWDER + ABOVE WASTE UPTO 50%

ROTOMOLDED BY CONVENTIONAL METHOD

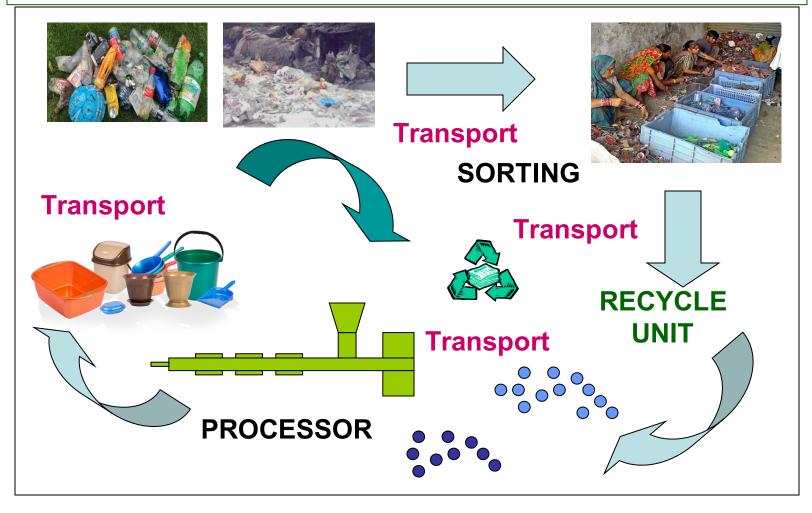
GOOD QUALITY PRODUCT WITH MULTICOLOR EFFECTS:





RECYCLING PROCEDURE IS LENGTHY CONSUMES TOO MANY RESOURCES FOR TRANSPORT





PLASTIC WASTE VOLUME IS 50 TIMES ITS WEIGHT: TRANSPORT COST IS VERY HIGH, ONLY AIR IS CARRIED!



PANDEMIC APPROACH TO SOLVE PP-VIRUS



- **❖ TRACK TEST AND TREAT**
- **❖ CONTAINMENT AND ISOLATE**
- ❖ CHANGE BEHAVIOUR AND LIFE STYLE
- ❖ NEW BIGGER WAVE OF PP-VIRUS IS EXPECTED AND IT IS BOUND TO COME: BE PREPARED
- ❖ PPE WILL ALSO ADD TO PPV SURGE EVEN AFTER COVID: BE PREPARED



Plastic Pollution Zones can be marked for the city and appropriate Disposal machines set up in those zones



CHANGE IN BEHAVIOUR AND LIFE STYLE:



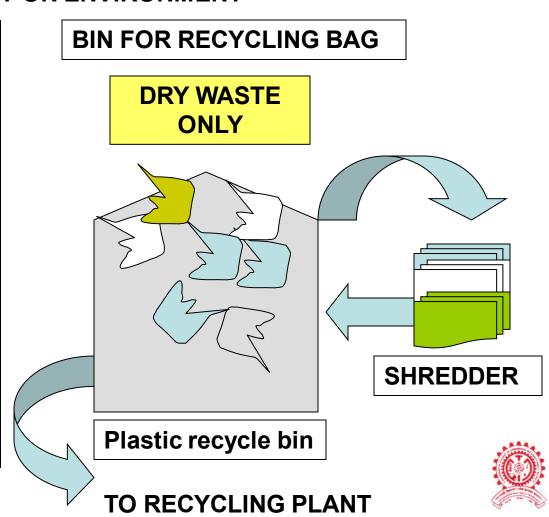
USE OF BIO-COMPOSTABLE PLASTIC FOR WET GARBAGE ONLY TO GIVE TRUE EFFECT ON ENVIRONMENT



BAG WITH WET WASTE ONLY



COMPOSTER



PANDEMIC APPROACH TO SOLVE PP-VIRUS

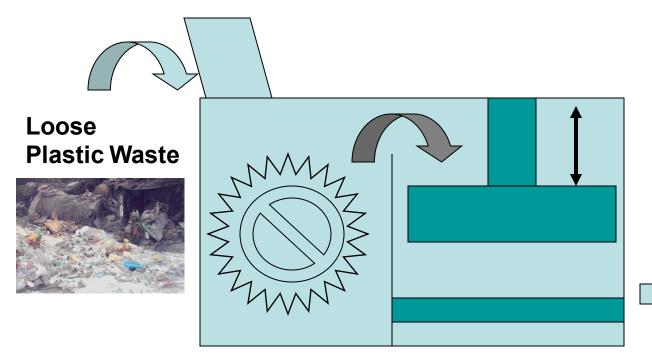


INVENT AND INNOVATE A VACCINE AND INJECT THE SOCIETY

WHAT IS THE VACCINE HERE FOR PP-VIRUS?

COMPACT PLASTIC DISPOSAL MACHINE

KEPT IN CONTAINMENT ZONE TO KILL THE PP-VIRUS AT SITE



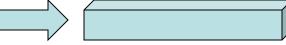
Increase of density

Reduced volume

Lower spread

Less transport cost

Compact Block



MACHINE FOR KILLING PP-VIRUS:



PLASTIC DISPOSAL MACHINE:

COMPACT WITH SHREDDER, COMPRESSION MOLDING / SHEET OR BLOCK MAKING UNIT

EACH CONTAINMENT ZONE WILL HAVE ONE SUCH UNIT

MIXED PLASTIC WASTE IS INPUT AND PLASTIC COMPOSITE SHEET OR BLOCK IS THE OUTPUT.

LEADS TO VOLUME REDUCTION AND EASE OF TRANSPORTATION AND ALSO DRASTIC REDUCTION IN COST

IF NEEDED, THE GARDEN DRY WASTE CAN ALSO BE MIXED TO MAKE WOOD- POLYMER COMPOSITE

THE SHEETS AND BLOCKS CAN BE USED FOR ROAD CONSTRUCTION, FUEL / POWER GENERATION,



PLASTICS WASTE DISPOSAL MACHINE:



Reports indicate that each person in Maharashtra uses 700 plastic bags in a year, mostly as packaging for grocery items and dry food.

This leads to about 25 g plastic waste/ person/day In a community of 100 flats with an average of 4 persons per flat, this works out to be 10 Kg plastic waste /day

Compact plastic disposal machine can work for 1 to 2 hr and convert all the plastic waste to blocks/ sheets. These can be used locally or transported for further applications.

Advantage is of densification of plastic waste, reduction in volume, ease of storage and economic transport directly to the user.



SUMMARY AND CONCLUSION



PLASTIC POLLUTION VIRUS CAN BE ARRESTED BY

- ❖ RECYCLE AND REUSE OF MATERIALS: PROPER SYSTEM IS TO BE ESTABLISHED
- ❖ INTRODUCING SEPARATE STREAM AT SITE ITSELF FOR COMPOSTABLE AND RECYCLING MATERIALS
- **❖ NOT USING COMPOSTABLE PLASTIC FOR RECYCLABLES DRY WASTE**
- **❖ DE-CENTRALIZE THE PLASTIC WASTE DISPOSAL**
- ❖ IDENTIFY ZONES WHICH HAVE HIGH PLASTIC WASTE PRODUCTION
- ❖ SET UP A COMPACT PLASTIC WASTE DISPOSAL SYSTEM IN THE ZONES
- **❖ REDUCE TRANSPORTATION OF PLASTIC WASTE**
- **❖ EDUCATE PEOPLE, GOVERNMENT STAFF, PLASTIC MANUFACTURERS, USERS, GARBAGE HANDLING STAFF.....**



SAVE ENVIRONMENT BY THE 4 R PRINCIPLE





