

**Seventh Regional 3R Forum in Asia and the Pacific  
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**Background Paper on  
3R as The Basis for Rural Resources and  
Waste Management for Regional  
Development- Implications towards SDGs**

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# INTRODUCTION

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- ✘ Agriculture contributed between 0.7% and 30% of total GDP for Asia-Pacific region.
- ✘ In 2005, approximately 13 billion metric tons of biomass was harvested worldwide
- ✘ Rural areas often suffered numerous development challenges mainly because
  - + Most opportunities and provision of services favored towards cities, urban areas and large community



# TYPICAL AGRICULTURE WASTES

# THE OBJECTIVES OF THIS PAPER ARE:

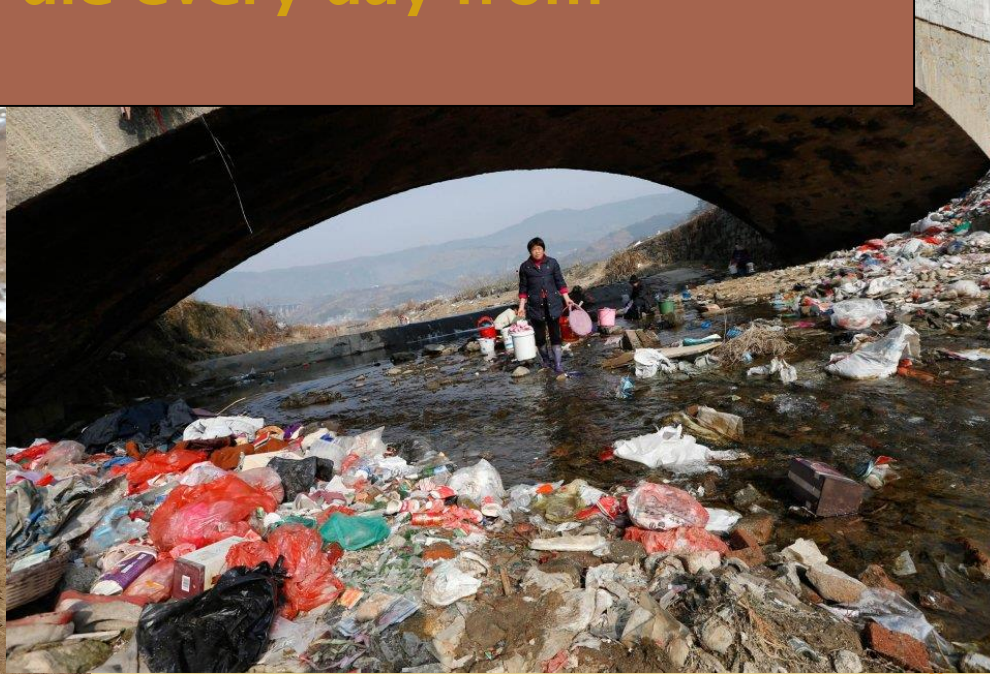
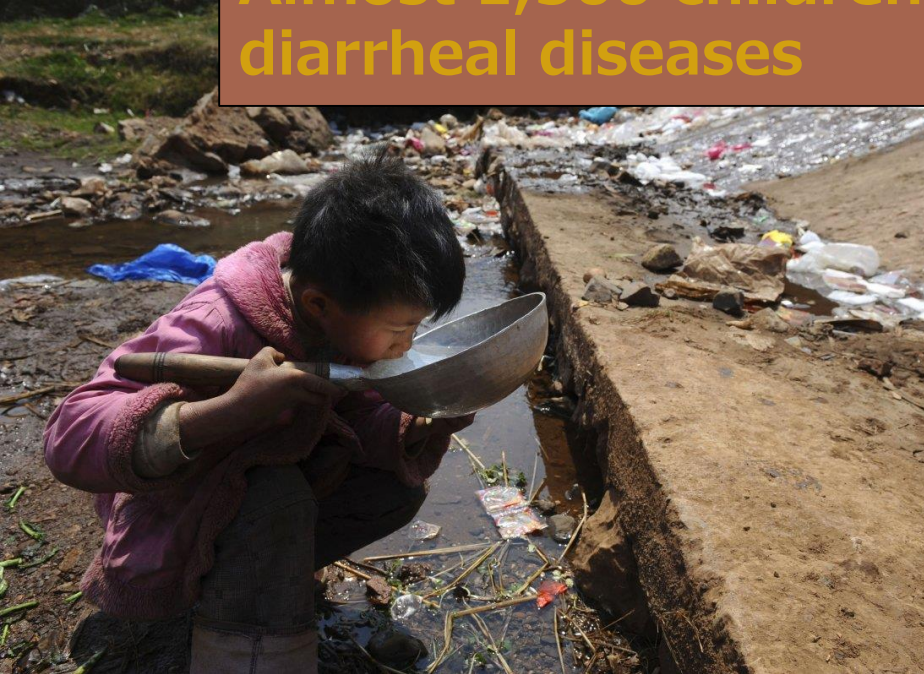
- ✘ To deliberate on the current status of rural resources and waste managements in Asia and the Pacific,
- ✘ To highlight the importance of 3R in rural development,
- ✘ To discuss the current policy issues and gaps,
- ✘ To elaborate on the economic potentials of 3R in resources and waste management, and the cost of inaction or loss of opportunity,
- ✘ To discuss the challenges of 3R waste management in rural areas and its implications towards the SDG,
- ✘ To give some case studies and model cases on economic utilization of agriculture and biomass waste management,
- ✘ To suggest the way forward, namely on the strategic direction on how Asia-Pacific countries could strength their policy and programmes in circular economic utilization of rural waste/resources.

# 3R IN RURAL RESOURCES AND WASTE MANAGEMENT

- ✘ In rural areas, open dumping is very common
- ✘ Threat to the public health, and degrade the environmental quality.
- ✘ The composition of waste includes organics and biodegradables
- ✘ It is reported that 5 of the 10 top killer diseases of children aged 1-14 in rural areas are related to water and sanitation



**Almost 1,500 children die every day from diarrheal diseases**



# CURRENT STATUS OF RURAL RESOURCES AND WASTE MANAGEMENT

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- ✘ MSW generation and agriculture wastes were about 1.5 million and 260,000 tonnes per day, respectively.
- ✘ PR China is the highest MSW generator with 620,630 tonnes per day.
- ✘ Second largest rural waste generator is India with 299,785 tonnes per day.

**Rural population (% of total population) and percentage or rural population growth between 2006 and 2015 (\* Calculated as the difference between total population and urban population)**

<b>ASEAN+3 / EAS</b>	<b>2014*</b>	<b>2015*</b>	<b>Growth rate, %, 2006-2015</b>
Brunei Darussalam	23.1	22.8	-0.03
Cambodia	79.5	79.3	-0.01
China	45.6	44.4	-0.12
Indonesia	47.0	46.3	-0.07
Japan	7.0	6.5	-0.06
Korea, Rep.	17.6	17.5	-0.01
Lao PDR	62.4	61.4	-0.10
Malaysia	26.0	25.3	-0.07
Myanmar	66.4	65.9	-0.05
Philippines	55.5	55.6	0.02
Singapore	0.0	0.0	0.00
Thailand	50.8	49.6	-0.12
Timor-Leste	67.9	67.2	-0.06
Vietnam	67.0	66.4	-0.06
PIF			0.00
Australia	10.7	10.6	-0.01
Kiribati	55.8	55.7	-0.01
Marshall Islands	27.6	27.3	-0.02
Micronesia, Fed. Sts.	77.6	77.6	0.00
New Zealand	13.7	13.7	0.00
Samoa	80.7	80.9	0.02



**Rural population (% of total population) and percentage or rural population growth between 2006 and 2015 (\* Calculated as the difference between total population and urban population) (cont'd)**

<b>PIF</b>	<b>2014*</b>	<b>2015*</b>	<b>Growth rate, %, 2006-2015</b>
<b>Solomon Islands</b>	78.1	77.7	-0.04
<b>Palau</b>	13.5	12.9	-0.08
<b>Papua New Guinea</b>	87.0	87.0	0.00
<b>Tonga</b>	76.4	76.3	-0.01
<b>Tuvalu</b>	41.2	40.3	-0.09
<b>Vanuatu</b>	74.2	73.9	-0.03
<b>SAARC</b>			0.00
<b>Afghanistan</b>	73.7	73.3	-0.03
<b>Bangladesh</b>	66.5	65.7	-0.07
<b>Bhutan</b>	62.1	61.4	-0.07
<b>India</b>	67.6	67.3	-0.03
<b>Maldives</b>	55.5	54.5	-0.11
<b>Pakistan</b>	61.7	61.2	-0.04
<b>Sri Lanka</b>	81.7	81.6	0.00
<b>Others</b>			0.00
<b>American Samoa</b>	12.7	12.8	0.01
<b>Fiji</b>	46.6	46.3	-0.03
<b>French Polynesia</b>	44.0	44.1	0.01
<b>Guam</b>	5.6	5.5	-0.01
<b>Korea, Dem. People's Rep.</b>	39.3	39.1	-0.01
<b>Mongolia</b>	28.8	28.0	-0.09
<b>New Caledonia</b>	30.3	29.8	-0.06
<b>Northern Mariana</b>	10.7	10.8	0.00

## Total MSW and agriculture waste generation based on rural population 2015

ASEAN+3 / EAS	Rural population, 2015*	MSW Generation (kg capital <sup>-1</sup> day <sup>-1</sup> )	Agricultural Waste Generation (kg capital <sup>-1</sup> day <sup>-1</sup> )	MSW generation, 2015 (tonnes day <sup>-1</sup> )	Agriculture Waste generation, 2015 (tonnes day <sup>-1</sup> )
Brunei Darussalam	96,000	0.87	0.131	83.52	12.58
Cambodia	12,350,000	0.95	NA	11,732.50	NA
Indonesia	119,144,000	0.52	0.01	61,954.88	1,191.44
Lao PDR	4,175,000	0.7	0.105	2,922.50	438.38
Malaysia	7,672,000	1.52	0.228	11,661.44	1,749.22
Myanmar	35,519,000	0.44	0.066	15,628.36	2,344.25
Philippines	56,016,000	0.5	0.075	28,008.00	4,201.20
Singapore	-	1.49	0.224	-	-
Thailand	33,726,000	1.76	0.264	59,357.76	8,903.66
Vietnam	60,905,000	1.46	0.219	88,921.30	13,338.20
Timor-Leste	833,000	NA	NA	NA	NA
China	608,461,000	1.02	0.153	620,630.22	93,094.53
Hong Kong SAR, China	-	1.99	0.191	-	-
Macao SAR, China	-	1.47	0.228	-	-
Japan	8,246,000	1.71	0.257	14,100.66	2,119.22
Korea Rep	8,874,000	1.24	0.186	11,003.76	1,650.56

\* Calculated as the difference between total population and urban population. Aggregation of urban and rural population may not

add up to total population because of different country coverage.

# Total MSW and agriculture waste generation based on rural population 2015

PIF	Rural population, 2015	MSW Generation (kg capital <sup>-1</sup> day <sup>-1</sup> ) <sup>10</sup>	Agricultural Waste Generation (kg capital <sup>-1</sup> day <sup>-1</sup> )	MSW generation, 2015 (tonnes day <sup>-1</sup> )	Agriculture Waste generation, 2015 (tonnes day <sup>-1</sup> )
Australia	2,517,000	2.23	0.863	5,612.91	2,172.17
Micronesia, Fed. Sts.	81,000	NA	0.034	NA	2.75
Kiribati	63,000	NA	0.05	NA	3.15
New Zealand	624,000	3.68	0.45	2,296.32	280.80
Samoa	156,000	NA	0.065	NA	10.14
Solomon Islands	453,000	4.3	0.65	1,947.90	294.45
Palau	3,000	NA	0.038	NA	0.11
Papua New Guinea	6,628,000	NA	0.068	NA	450.70
Marshall Islands	14,000	NA	NA	NA	NA
Vanuatu	196,000	3.28	0.45	642.88	88.20
Tonga	81,000	3.71	0.525	300.51	42.53
Tuvalu	4,000	NA	0.065	NA	0.26
<b>SAARC</b>					
Afghanistan	23,841,000	NA	NA	NA	NA
Bangladesh	105,811,000	0.43	0.065	45,498.73	6,877.72
Bhutan	475,000	1.46	0.255	693.50	121.13
India	881,721,000	0.34	0.105	299,785.14	92,580.71
Maldives	222,000	2.48	0.33	550.56	73.26
* Pakistan	115,701,000	0.84	0.158	97,188.84	18,280.76
Sri Lanka	17,044,000	5.1	0.765	86,924.40	13,038.66

\* Calculated as the difference between total population and urban population. Aggregation of urban and rural population may not add up to total population because of different country coverage.

# THE IMPORTANCE OF 3R IN RURAL DEVELOPMENT

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- ✘ Regional development
  - + Addressing regional disparities between urban and rural areas
- ✘ 3R in the context of SDGs for rural development:
  - + **Goal 2** : Sustainable crop production and food source
  - + **Goal 7**: Access to affordable, reliable, sustainable and modern energy for all
  - + **Goal 12** : Ensures sustainable consumption and production patterns
  - + **Goal 13**: GHG emission reduction
  - + **Goal 15** : Ensures sustainability of ecosystem

# CURRENT POLICY ISSUES AND GAPS IN RURAL WASTE MANAGEMENT

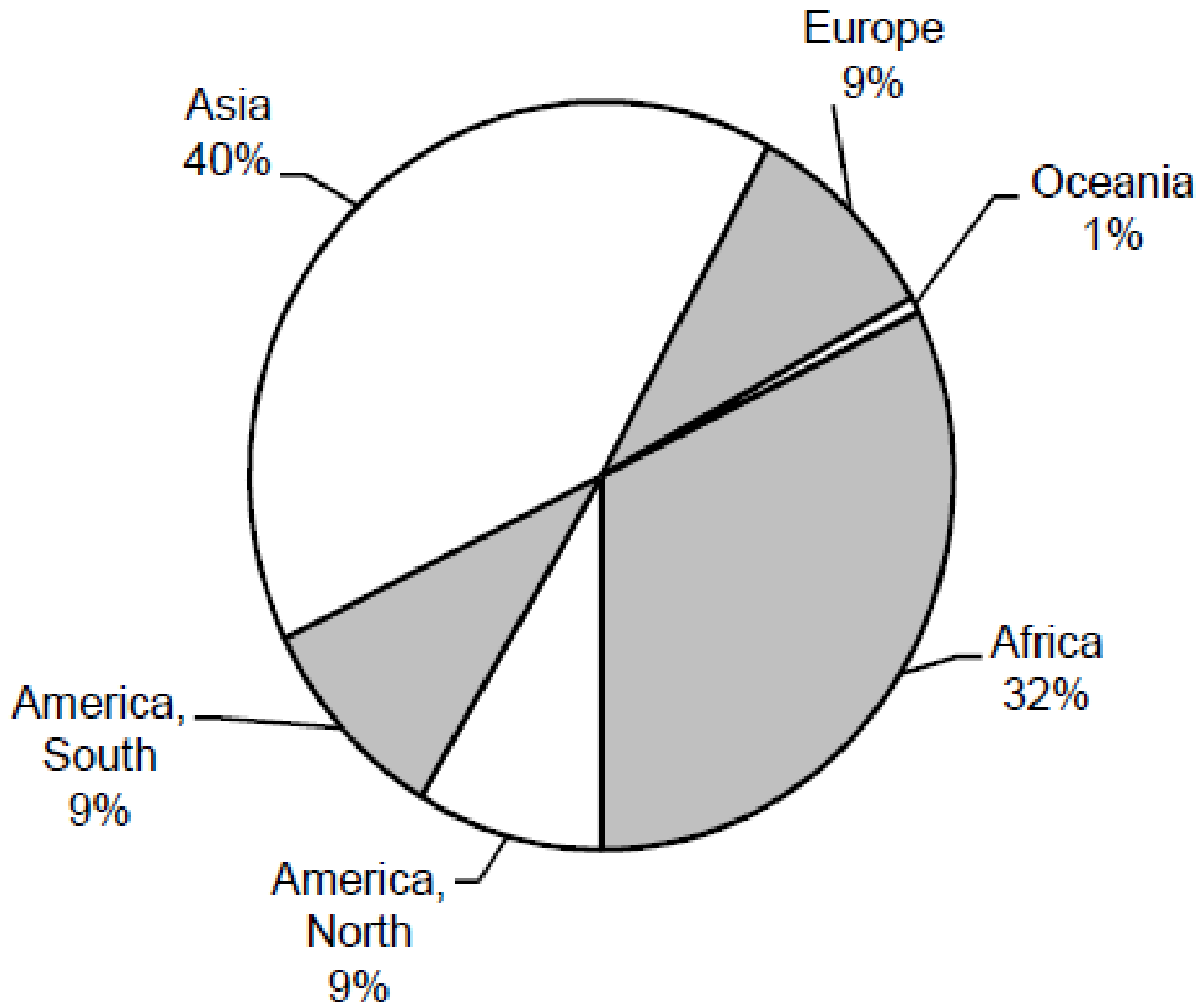
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- ✘ Incorporation of resource efficiency, source-efficient and low-carbon economy within the global context of green economy into the current rural development policies.
- ✘ Majority of the policies issued concentrate excessively on urban region while rural areas are neglected.
- ✘ Rural areas lack investments in infrastructure, education and skills development.
- ✘ Rural areas often face serious problems in compliance of regulation on waste management.

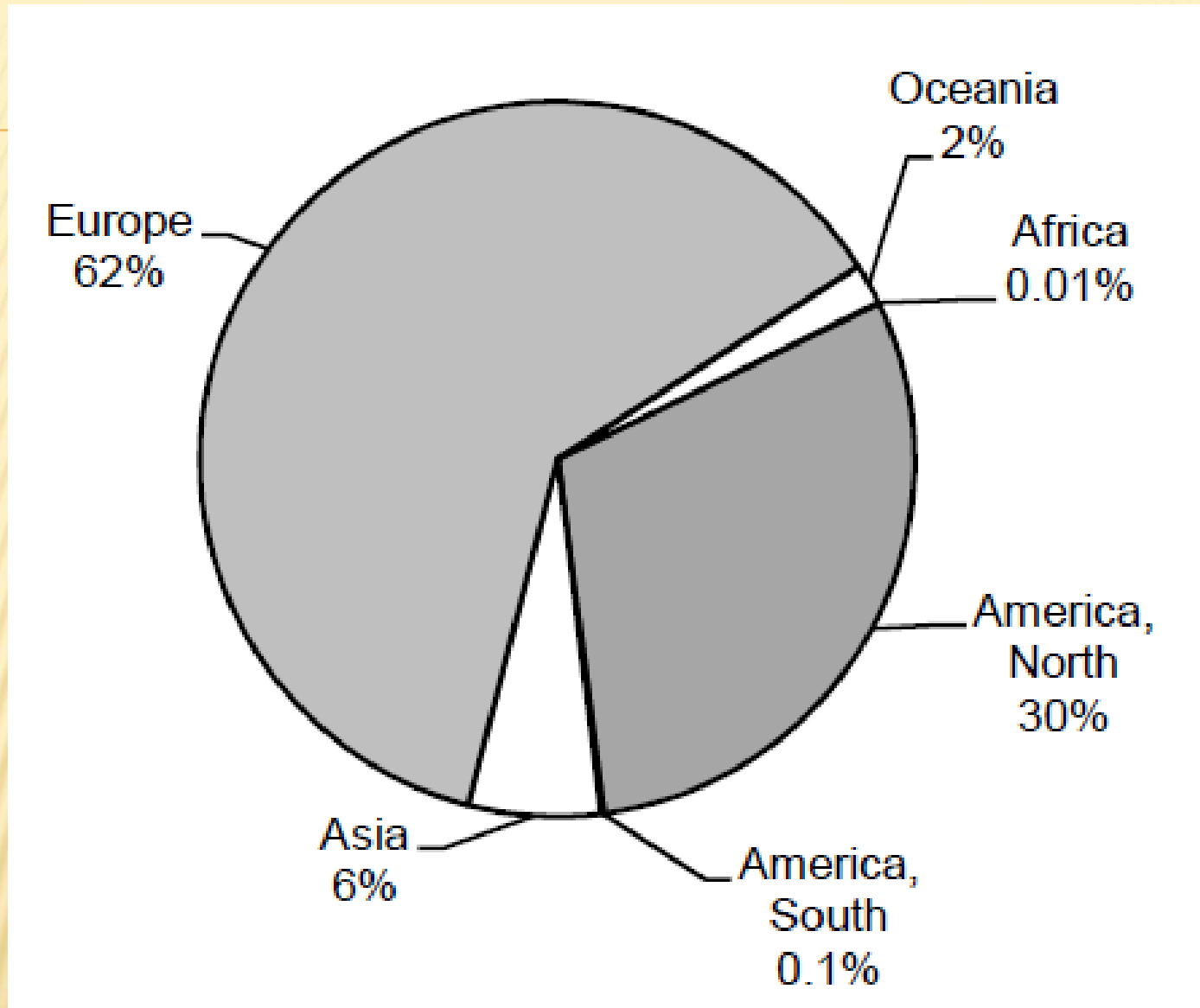
# ECONOMIC POTENTIAL OF 3R IN RESOURCE AND WASTE MANAGEMENT

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- ✘ Biomass currently supplies about a third of the energy in developing countries.
- ✘ Create job opportunities and also alternative income
- ✘ Improving the competitiveness of farming and forestry
- ✘ Protect the environment and the countryside
- ✘ Diversify the rural economy

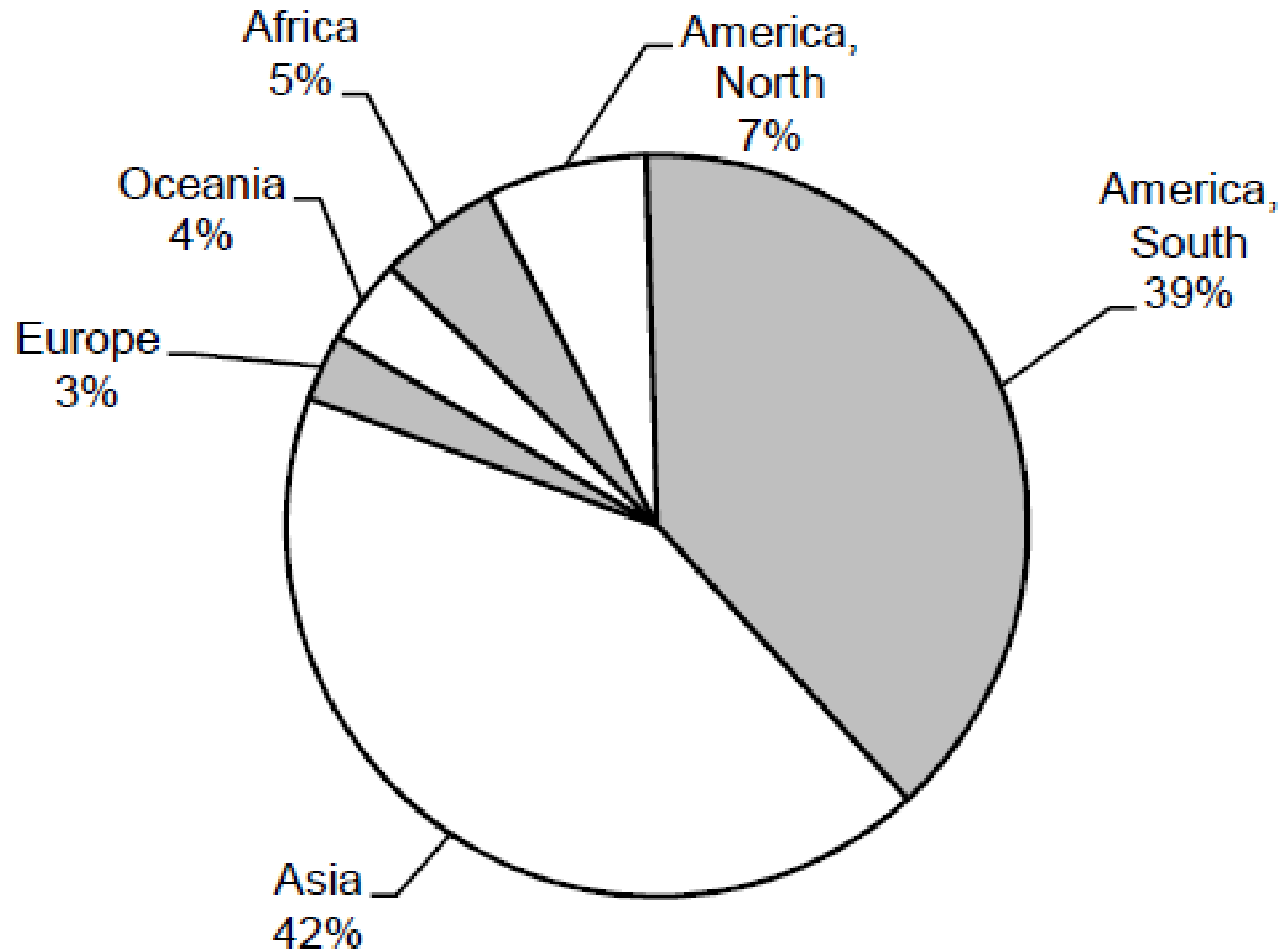


**Total solid biofuels production by region, 2013**

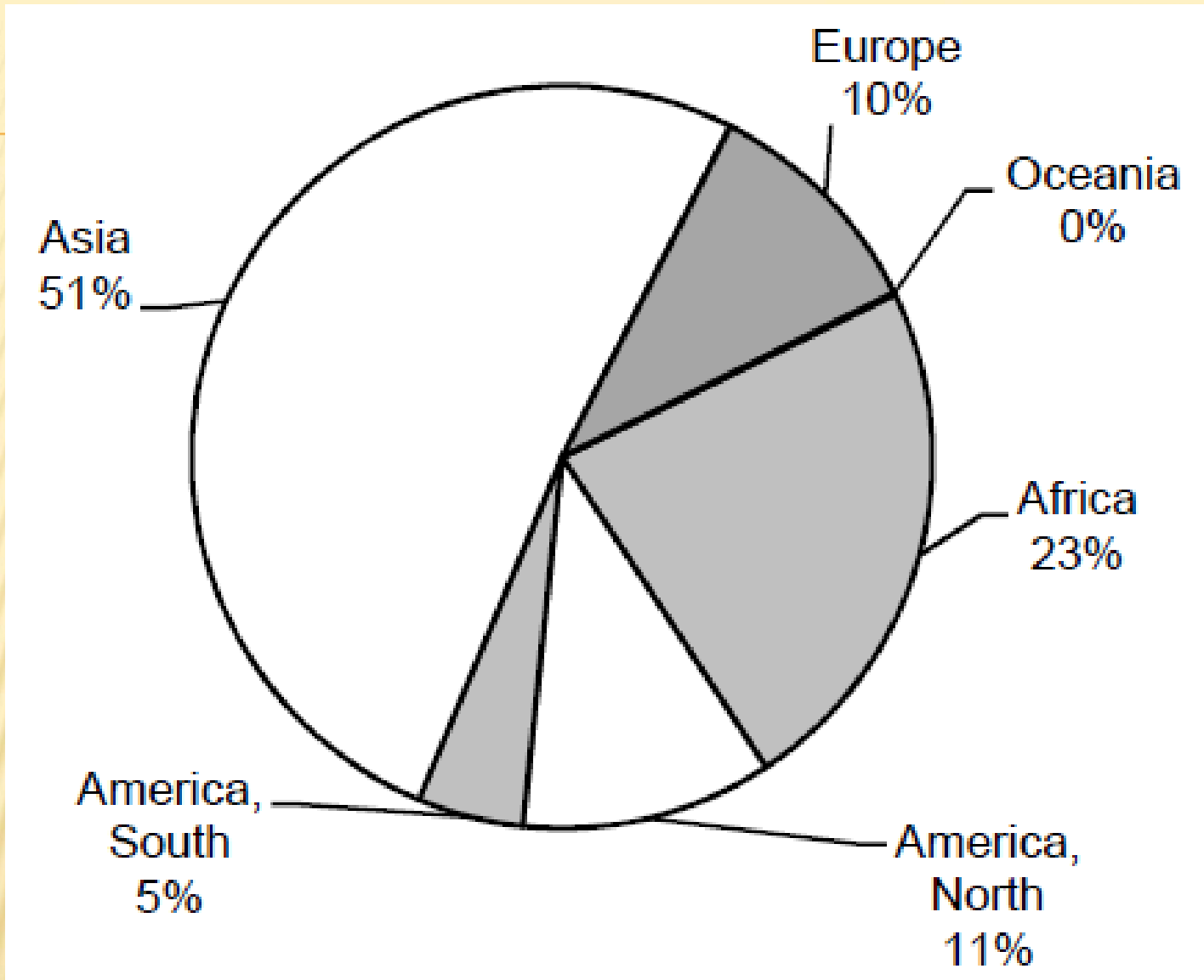


**Biogases production by region, 2013**





**Bagasse production by region, 2013**



**Energy production from wastes by region, 2013**

# **COST OF INACTION OR LOSS OF OPPORTUNITY**

## **× Social and environment impact**

- + Inadequate access to sanitation infrastructure
- + Surface water contamination
- + Spread of disease
- + GHG emission

## **× Economic opportunity**

- + Estimated 153 million tonnes of briquette (valued at USD 23 billion) could have been potentially produced from Asia Pacific region in 2013

# CASE STUDY: VIETNAM

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- ✘ Agriculture waste is a major waste type generated in rural region of Vietnam which is about 64,560 t y<sup>-1</sup>.
- ✘ 75% of the population living in rural areas are based in rural agricultural economy .
- ✘ Self-disposal is common in areas with no collection and disposal services.



# WASTE MANAGEMENT IN VIETNAM



# CASE STUDY: PR CHINA

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- ✘ It is estimated that about 108 tonnes of rural wastes per day was abandoned carelessly without proper treatment.
- ✘ 75.5% of rural waste is combustible wastes and 54.1% is compostable wastes
- ✘ Residents prefer to bury, burn, discharge waste onto river banks and dispose illegally in nearby landfills



# WASTE PICKERS HAVE SIGNIFICANT ROLES IN WASTE MANAGEMENT SECTOR IN CHINA



# CHALLENGES OF 3R WASTE MANAGEMENT IN RURAL AREAS AND IMPLICATIONS TOWARDS THE SDG

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- ✘ Most rural settlements are located in remote areas and distributed widely
- ✘ Willingness to participate in 3R program is highly motivated by incentives instead of self-initiatives
- ✘ Rural areas have issues with compliance of waste management regulation:
  - + Due to higher share of rural population, lower living standards, and waste collection services are poorly-developed



# THE WAY FORWARD

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- ✘ improve people's lives in rural communities
- ✘ Eliminate the gaps between urban and rural areas
- ✘ Policies need to be developed on financial and technical assistance
- ✘ Identify opportunities for international cooperation and joint ventures, technical transfer and transfer of business models and to create green business.

# THE WAY FORWARD

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- ✘ 1) Is the current policy frameworks stimulate long-term investments on rural resource and waste management?
- ✘ 2) How to strengthen current policies framework, in order to promote 3R and resource efficiency in rural region in the context of 2030 Agenda for Sustainable Development?



THANK  
YOU