

## NYJC Preliminary Examination 2018 Paper 2 Mark Scheme

1.

(a) With reference to Resources 1 and 2, suggest a suitable hypothesis for the group's investigation. [1]

- landuse changes has led to a heightening of flood risk and a reduction to the liveability of the area.
- an area with a higher proportion of vegetation cover is less prone to flooding than one with a lower proportion.

Point marked

(b) What safety precautions should the team take when conducting the stream investigation? [5]

- do a visual check if there are dangerous animals in the river or along the river banks e.g. crocodiles, monitor lizards etc.
- determine the best section for making wading measurements by noting the potential risk such as slippery rocks, deep segments, pot holes, quick sand etc.
- always probe the stream bed ahead with a rod when moving from bank to bank. Keep your feet spread apart and alignment of legs parallel to the flow for better stability.
- wear a safety jacket when wading and conducting discharge measurements. Tie the tagline securely so that you may pull yourself out, if necessary.
- always follow safety precautions when entering the stream. If the water is too deep or swift, select another site. Never venture out into the stream alone without another person available to assist you in case of emergency.
- determine whether the river stage is rising or falling. Beware of rapid rises in river stage when wading and anticipate and allow for changes in flow conditions at the end of the measurement. It is a good idea to select an object (rock, stump, mark along bank, etc.) that is just above water surface and keep watching it to determine if the river stage is rising or falling.
- find out if there are dams at the upper reaches of the stream. Notify dam, reservoir or gate operators before entering stream.

Point marked

(c) Calculate the mean velocity of the channel in Resource 3 and sketch one line graph to represent the cross-sectional velocity of the upstream segment of Stung Chrey Bak Stream. [4]

Award 1 mark for the mean velocity of the channel

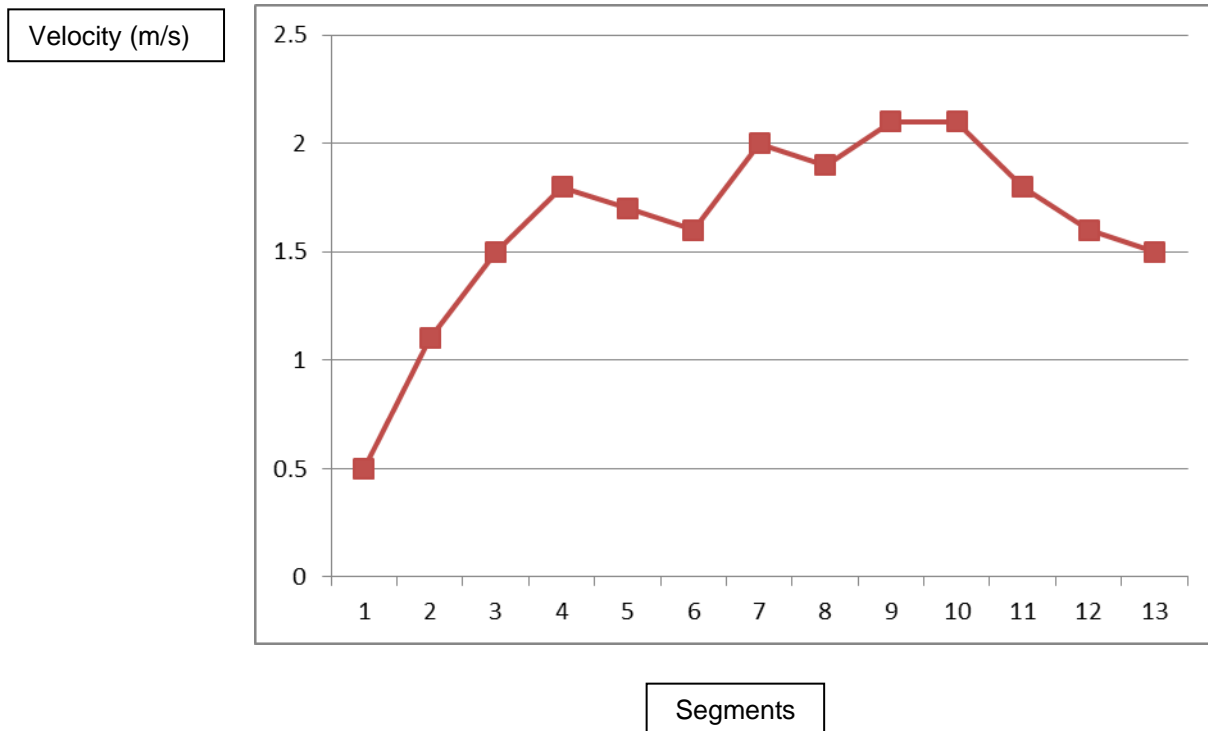
- Mean velocity of the channel – 1.6 m/s

For the sketching of line graph, 1 mark awarded for each of the following:

- Title

- Relative accuracy of the line graph
- Appropriate labels for both axes

**Line graph showing the cross-sectional velocity of the upstream segment of Stung Chrey Bak Stream**



Point marked

- (d) The team concluded that some of the data collected may not have been completely reliable and/or accurate. What improvements can be made in the planning and data collection process for this stream investigation? [6]

Limitations:

- data was done over two days in December during the dry season
- only one measurement (at 10am for both days) were taken for each stream segment
- measuring tape was unweighted. In addition, there were some boulders on the channel bed for the upper segment of the stream

Improvements made to planning:

- have a contingency plan to come back during the wet season in June/July and if possible during the intermonsoonal months of March and September to do stream measurements so that an average could be obtained across one year (annual Q) apart from noting the peak and low flow periods. Alternatively, students can also look for secondary data to find out about the level of discharge during the wet season to reduce the risk of having to collect primary data as discharge levels will be higher.

- to obtain more than one measurement per day instead of just at 10am. Afternoon measurements may record a different reading owing to greater surface evaporation or usage by farmers to irrigate their fields.

Improvements made to the data collection process:

- in improving the measurement of the wetted perimeter, it will be better to use a thicker rope so that it is more visible from the water surface and being heavier, it can sink to the bottom of the channel bed so that it hugs the channel bed for a more accurate measurement.
- as there are irregularities in the river bed on the upper segment, it will be good to make multiple measurements of the same site or to move to another site just slightly further upstream or downstream to obtain a more accurate measurement of the cross-section.

Level marked

Level	Marks	Descriptors
3	5 – 6	Response shows accurate knowledge in articulating the limitations of the data collected and is able to provide a comprehensive list of suggestions towards how it can be improved during the planning and data collection stages. Response uses resource accurately. Response is clearly focused on the question throughout with a detailed explanation of the reasons.
2	3 – 4	Response shows adequate knowledge in articulating the limitations of the data collected and is able to provide some suggestions towards how it can be improved during the planning and data collection stages. Use of resource may be limited or lack accuracy at times. Response may lack detail and depth or lack a clear focus on the question.
1	1 – 2	Response shows limited knowledge in articulating the limitations of the data collected and is only able to provide limited appropriate suggestions towards how it can be improved during the planning and data collection stages. Little or no use of the resource. Use of resource where present will lack accuracy. Response lacks details and focus on the question.
0	0	No creditworthy response

- (e) Evaluate the usefulness of the river velocity data shown in Resource 3 in ascertaining the flood risk of Stung Chrey Bak Stream. [9]

Indicative Content:

Usefulness points could include the fact that the data gives some idea of river response to rainfall event. In general, higher velocity due to an increase in Q would increase the risk of flooding (direct relationship). Discharge level can be obtained by multiplying the mean channel velocity and cross-sectional area data obtained during the fieldwork.

However, as the measurements were taken during the dry season, it does not give a full picture of how high discharge can reach during the wet summer monsoons in June/July.

In addition, one should refer to other information that would be useful in ascertaining flood risk. These could include the following:

- climatic characteristics – precipitation amounts and type will determine input into the channel. Seasonality in climate such as that of  $A_m$  or  $A_w$  may result in seasonal flooding i.e. flood risk increases during the wet monsoons (summer) with the convergence of trade winds at the ITCZ
- drainage basin characteristics – size, geology (degree of permeability determines the generation of quick flow which in return increases flood risk), topography, vegetation cover, drainage density and bifurcation ratio. Determines peak Q and lag time.
- obtain secondary records such as the annual pattern of discharge levels. Enables the calculation of recurrence interval in order to predict flood frequency and magnitude. Floods with greater frequency will register a shorter RI. Greater care should be paid to floods with longer R.I as they may be low in frequency but when it happens, the magnitude is going to be devastating.
- human disturbances within the drainage basin. Altered basins tend to lead to higher peak Q and a shorter lag time. Examples include channel modifications, deforestation, mining, agricultural practices, animal husbandry

A higher response will present evaluation of usefulness of resource and of knowledge of river velocity measurements. Response could also recognise that there are limitations related to the methods involved in the collection of velocity data. The improvised method is definitely less accurate as compared to mechanical methods such as a proper gauging station equipped with a mechanised flow metre.

Levels marked using H2 generic level descriptors for 9m open-ended DRQ for Theme 4.

Level	Marks	Descriptors
3	7–9	Response demonstrates accurate knowledge and understanding of geographical investigation skills and methods relevant to the given context. Provides a logical and well-developed evaluation, which may include perceptive insights for the strongest responses. Reflects strong critical thinking skills and a good understanding of the requirements of the question.
2	4–6	Response demonstrates good knowledge and understanding of geographical investigation skills and methods relevant to the given context. Provides an evaluation, which may be limited in depth and detail. Response reflects critical thinking skills in general but may not always be relevant to the question.
1	1–3	Response shows inadequate knowledge and understanding of geographical investigation skills and methods. Response has some, though limited, relevance to the given context. Provides little or no evaluation. May include material that is irrelevant to the question.
0	0	No creditworthy response.

**Note:**

1. The assessment involves qualitative rather than quantitative evaluation. Judgements on the level to be awarded to an answer will be based on the principle of 'best fit' determined by the descriptors within each level.
2. The descriptors in each level may be worded differently in actual assessment to link them more to the questions set. However, regardless of the wordings used, the quality of responses expected of candidates in each level would not deviate from that stated in the generic level descriptors.

### Theme 1: Tropical Environments

#### Mass movement hazards in Tropical Africa

2. Resource 4 and 5 show mass movement hazards in Sierra Leone and Egypt in Africa. Resource 6 shows the locations and climographs of Sierra Leone and Egypt.

(a) Identify the type of mass movement hazards as shown in Resources 4 and 5. [2]

- Resource 4 – landslide
- Resource 5 - rockfall

Point marked

(b) With reference to Resources 4 and 5 compare the physical effects of the mass movement hazards. [3]

- Similarity – large amount of debris brought downslope
- Differences – nature and size and materials brought downslope
  - Resource 4 – fine clayey materials that have been chemically altered (reddish regolith)
  - Resource 5 – large, angular boulders (only a difference in shape and size)

Point marked

(c) Suggest possible causes that could have led to the mass movement hazards in Resources 4 and 5. [5]

- MM occurs when safety factor has been breached. It is the ratio between:

$$F_s = \frac{\text{shear strength}}{\text{shear stress}}$$

- when the safety factor is less than 1 (that is, Shear Strength < Shear Stress), slope failure is imminent. For Resources 4 and 5, slope failure are a result of both physical and human factors.
- Physical causes:
  - Resource 4 – steep slopes, large trees that increase shear stress on the slope, weathered materials that have lost its cohesive strength as compared to parent rock
  - Resource 5 – presence of joints and bedding planes as seen in the photo help facilitate physical weathering like block disintegration or even translational slides
- Human causes:
  - Resource 4 – undermining of toe support at the foot of the slope due to the construction of houses (evidence of houses at the mid-ground of the photo)
  - Resource 5 – weight of buildings on top of the cliff increases shear stress

Level marked

Level	Marks	Descriptors
3	5	Response demonstrates accurate knowledge of the causes of mass movements in relation to the two resources vis-à-vis the safety factor. Well balanced answer with the inclusion of both physical and human causes. Good use of the resource with supporting data used to back up response.
2	3 – 4	Response demonstrates adequate knowledge of the causes of mass movements in relation to the two resources without making reference to the safety factor. Answer may only relate to either physical or human causes. Use of resource present in response but may lack accuracy. Response may lack clarity, detail and relevance to question.
1	1 – 2	Response demonstrates some inaccuracy in knowledge of the causes of mass movements in relation to the two resources without making reference to the safety factor. Response lacks detail, clarity and focus on the question.
0	0	No creditworthy response

(d) With reference to Resource 6, account for the rainfall pattern for Sierra Leone and Egypt. [7]

- Sierra Leone

- Tropical monsoon climate – caused by the migration of the overhead sun due to the short term factor of seasonal changes as well as land and sea differences that drive the local pressure gradient. Summer max. occurs during the period of high sun resulting in onshore winds. Winter minimum when ITCZ shifts to the southern hemisphere causing winds to blow offshore and hence no or little rain. Relate to the concept of secondary pressure cells.
- Egypt
  - Arid climate – caused by the sub-tropical high pressure systems at 30°N/S where cool dry air is forced to descent after moisture has been removed at the equator. Relate to the concept of primary pressure cells i.e. falling arm of the Hadley cell.

Level mark

Level	Marks	Descriptors
3	6-7	Response demonstrates accurate knowledge as well as clearly identifying and accounting for the differences in rainfall pattern between Sierra Leone and Egypt. Response uses resource accurately to account for the rainfall pattern between the two locations. Response is clearly focused on the question throughout with a detailed account of the differences between the two stations.
2	3 – 5	Response shows adequate knowledge and identifies the differences and attempts to account for them. Response use resource to account for the differences in precipitation but may not have accounted for the whole year's rainfall i.e. only selected time periods. Response may lack detail and depth or lack a clear focus on the question.
1	1 – 2	Response is able to identify the difference in rainfall pattern but shows limited knowledge in accounting for it. Response lacks detail, clarity and focus on the question.
0	0	No creditworthy response

(e) Using Resource 6, explain the role of climate in influencing the type of mass movement as shown in Resources 4 and 5. [8]

- climate which is the average weather conditions over 30 years affect geomorphological processes (weathering, mass movements and erosion) on a regional scale
- role of climate in influencing landslides in Sierra Leone
  - from Resource 6, Sierra Leone has a high mean annual rainfall of over 3000mm with bulk of it concentrated over a period of 8 months from Apr to November
  - presence of a high amount of rainfall promotes deep CW for most parts of the year → breaks down parent rock to become regolith (Resource 4) → decrease shear strength as its unconsolidated nature makes regolith prone to downslope movement. The extra weight of a deep regolith will increase the likelihood of instability.

- high amount of rainfall promotes luxuriant vegetation in the form of tropical monsoon forest → tall and big trees (Resource 4) adds weight to the slope → increase shear stress. Vegetation is able to prevent small scale MM but not for large scale ones like landslide
- slope is vulnerable to failure during the wet season (Resource 6) → twin effects: rain acts as a source of lubricant on the slope in allowing particles to move over one another; rain also increases pore water pressure which in turn decreases the frictional strength of the solid material hence weakening the slope.
- Role of climate in influencing rockslides in Egypt
  - from Resource 6, Egypt is an arid region with mean rainfall of only 183mm per annum.
  - low amount of ppt encourages PW all year round via insolation-induced weathering. As seen in Resource 5, the presence of joints allows block disintegration to occur due to repeated cycles of daytime heating and nocturnal cooling. This weakens the rock; causing blocks to become detached from the parent material. These blocks may fall from the cliff face via the process of rockfall or they may be detached from the parent material via rockslides along defined planes. In Resource 5, the bedding planes separating sedimentary layers can act to cause translational slides especially if the beds are dipping.
  - though CW may be limited by the little amount of moisture, selective CW along the lines of weaknesses may widen the joints and further weaken the rock; allowing rockslides to occur when safety factor is breached.

Level marked

Level	Marks	Descriptors
3	7 - 8	Response demonstrates accurate knowledge of the role of climate in influencing the type of mass movements in the two resources. Good and accurate use of resource in highlighting how climate determines weathering types on a regional scale in relation to the amount of insolation and precipitation received in the two localities. Response is clear, detailed and show focus on the question.
2	4 – 6	Response demonstrates knowledge of the role of climate in influencing the type of mass movements in the two resources. Explanation of the role of climate in determining weathering types on a regional scale in relation to the amount of insolation and precipitation received in the two localities may lack accuracy or detail in parts. Response is mostly clear but may lack focus on the question at times.
1	1 – 3	Response demonstrates some knowledge of the role of climate in influencing mass movements in general. Limited reference is made to the resource in explaining the type of mass movement. Response lacks details, clarity and focus on the question.
0	0	No creditworthy response



## Theme 2: Development, Economy and Environment

### Development Gap in Asia

3. Resource 7 shows employment structures and economic development of selected countries. Resource 8 shows the comparison between Internet penetration and mobile penetration of selected Asian countries and Australia. Resource 9 shows the internet user profile for Southeast Asian countries in 2013.

(a) With reference to Resource 7, describe the employment structures for both the richer and poorer countries. [4]

- richer countries have higher employment in the secondary (manufacturing) and tertiary sectors. For USA, its tertiary sector accounts for close to 80%. These countries tend to have a small or insignificant primary sector.
- in contrast, poorer countries have a higher percentage of people engaged in the primary sector especially for countries such as Ethiopia, Kenya, Sierra Leone, Bangladesh, China and India with more than 50% of its people engaged in this sector.
- however, as compared to the richer nations, the poorer countries are more diverse in terms of their economic structures. Countries like Mexico, Peru, Brazil, Egypt and Malaysia have close to 50% or more of their people employed in the tertiary sector. Primary sector employs only 25% or less of their population.

Point marked

(b) Name the mapping technique used in Resource 7 and state **one** strength and **one** limitation in representing the employment structures of the richer and poorer countries. [3]

Point marked

- pie charts
- strength - allows for quick comparison between different countries i.e. it represents data visually as a fractional part of a whole. Reference is made easier due to colour coding between sectors.
- limitation - does not show the total (absolute) or accurate figures. Size of the circles is similar for all the countries represented.

(c) With reference to Resource 8, compare the internet penetration and mobile penetration of Asian countries. [5]

- comparison between internet penetration and mobile penetration in general (2 marks)
  - higher mobile penetration than internet penetration. 6 countries register more than 100% penetration for mobile services as compared to none achieving 100 penetrations for internet services.
- comparison between the Asian countries for both internet penetration and mobile penetration (3 marks)

- higher internet penetration and mobile penetration for Developed and Newly Industrialising countries as compared to less developed countries. Countries like Japan and the 4 Asian tigers (Singapore, S Korea, Hong Kong and Taiwan) have more than 70% internet penetration and more than 90% mobile penetration.
- South Korea tops the list for internet penetration (80%) whilst Singapore and Hong Kong are joint-top for mobile penetration (150%).
- India remains the country with the lowest internet penetration (8%) and mobile penetration (50%)

Level marked

Level	Marks	Descriptors
3	5	Comparison of the internet penetration and mobile penetration of Asian countries is made. Good use of the resource with supporting data used to back up response. Response is clear and shows focused and detailed comparison.
2	3 – 4	Comparison of the internet penetration and mobile penetration of Asian countries is made. Use of resource present in response but may lack accuracy. Response may lack clarity, detail and relevance to question.
1	1 – 2	Comparison is limited with only one or two relevant trends mentioned. A large part of the response remains descriptive. Response lacks detail, clarity and focus on the question.
0	0	No creditworthy response

(d) Using Resources 7 and 8 and your own knowledge, explain the possible existence of a development gap amongst Asian countries. [6]

- definition of development gap – the gulf between rich and poor nations when measured using various **economic yardsticks** such as GDP/GNP per capita, energy consumption etc. As a broader definition, it could also include social (literacy, life expectancy, housing, gender etc.) environmental (sustainable development, waste management, pollution levels) and even political gap (voting rights)

From Resource 7 (economic development gap)

- as seen in Resource 7, countries with a larger tertiary and secondary sector tend to be economically better off than those with a larger primary sector owing to the higher value-added index tied to them.
- in Resource 7, Japan is the only Asian country amongst the richer nations with more than 95% of its people employed in tertiary and secondary sectors. Tertiary sector jobs may include low end services such as consumer related ones as well as higher end ones such as quaternary services such as legal, financial, marketing and advertising. At the apex, this will include the quinary sector comprising of top decision makers known as gold collared workers egs. CEOs,

CFOs, COOs Managing directors etc. Secondary sector in Japan will likely be those involved in high tech manufacturing, precision engineering, robotics etc.

- amongst the poorer nations, a development gap could also be present. Of the 4 Asian countries, Malaysia appears better off than the other 3 (China, India and Bangladesh) as 80% of its people are engaged in tertiary or secondary with more in the former.
- China, India and Bangladesh all have more than 50% of their people employed in the primary sector. Income derived from the agricultural sector tends to be unstable unlike manufacturing and services as agricultural produce, being perishable are affected by the vagaries of the weather. They are hence subjected to greater price fluctuations.

From Resource 8 (social development gap)

- Japan and the NIEs are ahead of the other Asian nations as they have a higher internet penetration and mobile penetration. These two services may be regarded as a proxy indicator to literacy rate amongst the countries. Internet penetration and mobile penetration (those that comes with data plan) require basic computer literacy in assessing the World Wide Web. They are also regarded as economic indicators as subscribers are charged a fee for the use of these services. Large parts of rural India and Indonesia may not have the financial means and computer skills to access the internet as compared to the more highly educated NIEs.
- China appears to be an anomaly. It has the same proportion of people engaged in the primary sector as India and with a slightly lower proportion in the tertiary sector. Yet, its internet penetration more than doubles that of India. This perhaps could be due to the Chinese being more savvy and open to using technology than the Indians. Role of the state in promoting its use could also be included such as the wide spread use of e-commerce and cashless mobile payment e.g. Alipay, Unionpay, Tencent finance etc in China.

Level marked

Level	Marks	Descriptors
3	5 - 6	Response demonstrates accurate knowledge of the concept of development gap in the context of structure of the economy. Good and accurate use of resources to highlight the economic and social gap between richer and poorer Asian countries. Ability to link the structure of a country's economy to the income level of countries. Response is clear, detailed and shows focus on the question.
2	3 – 4	Response demonstrates knowledge of the concept of development gap in the context of structure of the economy. Some use of resources to highlight the economic and social gap between richer and poorer Asian countries but may lack accuracy or relevance to context. Response is mostly clear and shows some supporting detail and focus on the question.
1	1 – 2	Response demonstrates some knowledge of the concept of development gap. Limited use of resources to explain the relationship between the structure of the economy and the existence of the development gap amongst Asian nations.

		Response lacks detail, clarity and focus on the question.
0	0	No creditworthy response

(e) With reference to Resources 8 and 9, explain the socio-economic opportunities and challenges which developing countries like Vietnam may experience with the growth of internet penetration. [7]

- Resource 8 shows Vietnam has an internet penetration of 28% which is ahead of other developing countries such as Thailand, The Philippines, Indonesia and India.
- Resource 9 shows Vietnam having a very young online population with 74% below 35 years of age. In terms of average time spent online, it came in second to Thailand at 26.2 hours in March 2013.
- Resources 8 and 9 appear favourable to Vietnam in terms of socio-economic opportunities brought about by her growth in internet penetration and a youthful internet savvy population.
- possible socio-economic opportunities
  - growth of the tertiary sector – e-commerce, online learning, web-page designers, online dating services etc.
  - outsourcing of services from TNCs – back-office functions and call centres (liken India and The Philippines)
  - sectoral shift from manufacturing to tertiary – increase in value-adding for the economy and allowing the country to move towards a knowledge based economy
  - improved overall welfare i.e. increase in purchasing power due to higher wages earned in the tertiary sector
  - exposure to cultural diversity – K pop, J pop, reality TV shows
- possible socio-economic challenges
  - widening of income gap between the educated and less educated who cannot afford the mobile phone or do not have knowledge of using the internet
  - exploitation of workers by TNCs – work conditions, wage depression
  - over-dependence on TNCs – footloose nature of TNCs may cause them to uproot and shift to other low cost locations if current host country loses its comparative advantage
  - states may have to cede power to the TNCs if they are unable to control them
  - negative influencers of the internet such as internet addictions, online gambling, internet scams, cyber-attack resulting in data breached

Level marked

Level	Marks	Descriptors
3	6 - 7	Response identifies the growth of internet penetration in Vietnam vis-à-vis its potential and challenges that accompany its development. Good and accurate use of the resources in supporting the arguments Response is detailed and shows focus on the question.
2	3 – 5	Response identifies the growth of internet penetration in

		Vietnam but the explanation on the possible socio-economic opportunities and challenges that accompanies its development may not always be shown clearly. Response lacks detail, clarity and focus on the question.
1	1 – 2	Response identifies the growth of internet penetration in Vietnam but there is limited or no explanation on the possible socio-economic opportunities and challenges that accompanies its development. Response lacks detail and relevance to the question.
0	0	No creditworthy response

### Theme 3: Sustainable Development

#### Waste Management in Asian Cities

4. Resource 10 shows the type of waste composition in Phnom Penh, Cambodia. Resource 11 is an infographic showing the plastic situation in Cambodia. Resource 12 shows a typical street scene in Phnom Penh. Resource 13 shows the typical characteristics of waste management in Asian cities by level of development. Resource 14 shows a news article about plastic bag fee implementation in Phnom Penh.

- (a) **Describe the composition of waste in Phnom Penh as shown in Resource 10.** [2]

#### Possible responses

- Waste in Phnom Penh is mostly composed of food wastes at 63.3%.
- The second highest type of waste is plastic at 15.5%.
- The rest of the waste types are less significant with paper 6.4%, metal 0.6% and glass 1.2%.

Point marked

- (b) **With reference to Resource 11, account for the percentage of plastic waste in Phnom Penh as shown in Resource 10.** [5]

#### Indicative content

- According to Resource 11, the price of plastic is very cheap. 500 pieces of plastic bags, weighing 1kg, only cost 5,000 riels, which is approximately S\$1.68. Plastic is such an amazingly cheap, light, flexible, durable and convenient material that is being used widely in packaging such as bags, bottles, straws, cups, containers etc. The extremely low price contributed to overconsumption. Most of the time, plastic packaging is also contaminated with food waste and are unlikely to be recycled or even reuse. This contributes to the high amount of plastic waste.
- In Phnom Penh, each person consumes a staggering number of 2,000 plastic bags annually. This is about 10 times higher than those from the European Union who consumes only 200 plastic bags annually. The rampant usage of

single-use plastic contributed to the high percentage of plastic waste in Phnom Penh.

- Resource 11 shows that the projected increase to 7 million tourists in 2020 can potentially lead to more plastic pollution in the future. This is because tourists who visit Cambodia have a high tendency to generate plastic waste as well. Due to the lack of a filtration system, potable water is not readily available. As such, tourists who visit Cambodia will purchase bottled water for drinking and they are often single-use plastic water bottles. It is unlikely to find potable water source to refill so the bottles are not reused and tossed away as trash.

Levels marked

Level	Marks	Descriptors
3	5	Response shows accurate knowledge as well as clearly identifying and accounting for the percentage of plastic waste. Good use made of the resource with supporting data used to substantiate response. Response is detailed and shows focus on the question.
2	3-4	Response shows adequate knowledge and identifies the percentage of plastic waste and attempts to account for it. Use of the resource present in response but may lack accuracy. Response may lack detail and depth or lack a clear focus on the question.
1	1-2	Response shows limited knowledge and makes a limited attempt to account for the percentage of plastic waste. Little or no use of the resource to account for the plastic waste shown. Use of resource where present will lack accuracy. Response lacks detail and focus on the question.
0	0	No creditworthy response.

- (c) **With reference to Resource 12, explain how waste affects the liveability of Phnom Penh.** [4]

Possible responses

- Waste has become part of the lives of the poor communities.
- Piles of uncollected waste dumped on streets of the capital city as shown in Resource 12 is unsightly and gives a negative image of the country.
- It reflects poorly on the management ability of the government. Lack confidence in the ability of the government to solve the waste problem.
- The presence of rotting food waste dumped behind a mobile food cart suggests poor hygiene standards, making food safety a health concern for anyone.
- Waste is not biodegradable, which means it stays around for thousands of years and slowly leaks harmful chemical substances into the surrounding environment.
- Rotting food gives off a pungent smell.

Point marked

- (d) **With reference to Resource 13, compare the solid waste management characteristics among Asian cities by level of development.** [5]

Indicative content

- Waste generation (kg/capita-day) is highest in developed Asian cities at more than 1kg/capita-day. Rapidly developing Asian cities generate between 0.5 to 1.5kg/capita-day of waste. The less developed Asian cities generate 0.3 – 0.7 kg/capita-day of waste, the lowest among the three.
- Waste collection rate is also the lowest for less developed Asian cities at less than 70%. Rapidly developing cities have a moderately high percentage of 80-95%, while developed Asian cities have close to 100% collection rate.
- Recycling is formal in developed cities and informal in less developed Asian cities. Rapidly developing Asian cities can conduct both formal and informal recycling.
- Waste expenditure from municipal budget takes between 15 to 40% in less developed Asian cities due to their lower GDP. Comparatively, developed cities only need to devote 1-5% of their municipal budget for waste. The percentage expenditure for rapidly developing cities has a moderate range from 5 to 25%.

## Levels marked

Level	Marks	Descriptors
3	5	Response demonstrates accurate knowledge and a good understanding of the waste characteristics among Asian cities. Comparisons of waste characteristics are made between the three categories of Asian cities by level of development. Good use of the resource with supporting data used to back up response. Response is clear and shows focussed and detailed comparison.
2	3-4	Comparisons of waste characteristics among Asian cities seen in response. Some inaccuracies of knowledge and understanding in terms of the waste characteristics. Use of resource present in response but may lack accuracy. Response may lack clarity, detail and relevance to question.
1	1-2	Response shows an attempt at a comparison among Asian cities but with little accurate knowledge shown or use of the resource. Comparison is limited with only one or two relevant waste characteristics. Response lacks detail, clarity and focus on the question.
0	0	No creditworthy response.

- (e) **Using all resources and your own knowledge, assess the challenges faced in managing plastic bag consumption in less developed cities.** [9]

Indicative content

Challenges faced could include low prices of plastic bags, overconsumption by individuals, and consumption by tourists, rampant use, habit and attitudes, waste management expenditure, waste collection system, recycling facilities, public education, enforcement etc. The extent of the difficulty should be presented.

A higher level response will identify the traits and characteristics in less developed cities and make explicit links to how these traits contribute to the challenges faced in

managing plastic bag consumption. Candidates should give their viewpoint upon considering all the resources.

*Levels marked using H2 generic level descriptors for open-ended 9m DRQ on Themes 1, 2 and 3.*

**C H2 Generic Level Descriptors for Open-Ended 9m DRQ on Themes 1, 2 and 3**

Level	Marks	Descriptors
3	7–9	<p>Response demonstrates a clear knowledge and understanding of the context in the question. Uses relevant, detailed and accurate factual information and conceptual understanding. Reflects strong critical thinking skills and may include perceptive insights for the strongest responses. Source(s) is well used to support the response.</p> <ul style="list-style-type: none"> <li>Provides a logical and well-developed evaluation well founded on evidence and/or different viewpoints.</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>Makes a decision which clearly addresses different elements of the issue and/or interest of different stakeholders</li> </ul>
2	4–6	<p>A satisfactory response which is generally sound and contains relevant points, but may not always focus on the context in the question. Uses factual information and conceptual understanding that is generally appropriate to the given context but lacks detail and may contain some inaccuracies. Displays general critical thinking skills. Source(s) is used to support parts of the response.</p> <ul style="list-style-type: none"> <li>Provides an evaluation, which may be limited in depth and sufficient elaboration in some parts.</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>Shows some attempt to address different elements of the issue and/or views of different stakeholders when making a decision but is not well-developed</li> </ul>
1	1–3	<p>Response shows a poor understanding of the context in the question. Uses basic factual information and conceptual understanding which has some, but limited relevance to the question. Source(s) is not used or not accurately used to support the response.</p> <ul style="list-style-type: none"> <li>Provides little or no evaluation</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>Evidence of decision-making, if present, is simple and may be flawed</li> </ul>
0	0	No creditworthy response.