# 2018 H2 P1 Essay

## **Question 1**

a) Explain the characteristics of mass movement processes that occur in the tropics. [12]

# \*\* For mass movement types, possible types of mass movement that can occur in tropical regions:

- ➔ Heave (although more prominent in the temperate regions, can occur in tropical regions when extreme changes in temperatures or alternate cycles of wetting and drying occurs) [Possible in AW climate types where there are temperature and rainfall variations throughout the year]
- → Flow (Common in Af and Am climates where high and intense rainfall events can occur)
- ➔ Slides (Common in BS and BW climates where lack of vegetation could induce rock slides along slide plane). May also occur in AW or Am climates where rotational slips could occur in the presence of a curvilinear slide plane
- → Falls (common in all climate types where weathering causes lines of weaknesses to develop and once it gave way along areas of weaknesses, falls occur.

\*\* Need to make some subtle link climatic types where mass movement types could occur. If students merely relate to characteristics w/o the links to the climatic types, maximum of 9 marks.

#### Characteristics of Heave:

Speed: Very slow (1mm to 1cm per year)

Movement: Particles are lifted perpendicularly and dropped vertically

Factors dependent on: Alternating cycles of expansion and contraction which can be attributed to large temperature changes, alternating cycles of wetting and drying

Water content: generally low

Key features: bent tree trunks, terracettes

Material size: Varies from large to small

## Characteristic of flow:

Speed: Generally fast Movement: Materials when incorporated with water, essentially moves as a semi-fluid mass Water content: Very high Factors dependent on: Water content (which determines speed and volume) Material size: Varies (from earthflow (mixed)to mudflow (generally fine))

## Characteristic of Slide:

Speed: Fast Movement: Along slide plane and in contact with surface Water content: low (may only be present to lubricate the surface Factors dependent on: presence of slide plane Material size: varies (Can be a rock or a consolidated mass)

#### Characteristic of fall:

Speed: Very fast Movement: Free fall through sky Water content: Low or absent Factors dependent on: Lines of weakness Material size: varies but usually rather large (rock falls)

Level	Marks	Descriptors
4	10-12	Response shows good understanding of the issues at hand through clear explanations and analysis. There is good coverage in terms of breadth and depth. Relevant examples are used consistently to illustrate arguments.
3	7-9	Response is generally explanatory in nature. There are instances of use of appropriate examples to illustrate particular arguments although it may not be done consistently.
2	4-6	Response is descriptive rather than explanatory. Attempts at explanation come across as being inadequate or unclear, although the response shows relevance to the question in broad terms.
1	1-3	Response is fragmentary, lacks focus or relevance to the question. It may be brief as well.
0	0	No creditworthy response.

# b) The role of water is important in affecting the different mass movement types that occur in the tropics. Discuss the validity of this statement. [20]

The role of water should never always be ignored in mass movements and that water certainly plays an important role in **influencing the mass movement types** as well as the **rate at which mass movements occur** in different tropical environments. This certainly means that the **effects of water on mass movements** should not be ignored. However, it must be noted that **the role of water in various mass movement types differ very much depending on the type of mass movement**. Strictly speaking, we are also looking at three main kinds of mass movements, namely heave, flow and slide.

# Supporting Argument

- Water, as will be argued, plays the most significant role in flows within tropical regions as humid tropical regions are associated with high precipitation. For example in flows, nearly all movement occurs as turbulent motion within the body of the flowing mass. In the case of flows, the material is essentially semi-fluid. As with flows, an abundant amount of water is usually present.
- In the case of mudflow, earthflow and debris flow in humid tropical regions such as Tropical rainforest, Tropical Monsoon and Tropical wet and dry (Savannah), water also plays an extremely important role during wet season or during times of intense precipitation. The main difference between these kinds of flows involves the kinds of materials which consequently has an effect on the speed of movement. However it can be said that in general these forms of flows require water to be present to sustain the mass movement. For example, in the case of mudflows, during an event of a heavy rainfall, exposed regolith becomes rapidly saturated. As such, the cohesion strength between particles becomes virtually lost and unstable resulting in a decrease in shear strength and moves down the slope in a turbulent manner as mudflows. In such an example, water is an extremely important component in the mass movement process.

Although water is the main influencing component of mass movement in flows, water also plays a role in heave which is also known as creep. One kind of heave in which water plays an important role is frost creep. In heave, although the main process has been expansion and contraction and the subsequent moving of materials down a slope.

**In creep, water is important because** it is responsible for alternating cycles of wetting and drying or areas that experience temperature fluctuations during the year such as Tropical wet and dry climates. The slope expands when it is wet and contracts when it dries. As a result of this, heave is resulted.

- As can be seen, in this kind of heave process, the role that water plays is very important. If both soil creep results from extreme temperature changes or alternate wetting and drying, it can be said that the role of water cannot be ignored.
- In the case of slides, although water cannot be seen as the main influencing factor, it plays a supporting role in providing the necessary lubricant that facilitates the mass movement process.

# **Counter Argument**

- However, it must be recognized that water does not play an extremely important role in all mass movement types. In the case of slides, the main contributing factor has been the presence of a slide plane.
- In slides, it involved the movement of a coherent mass of material along a distinct and well-defined failure plane. In slides, as mentioned earlier, water is not essential although we may see it as that it may be necessary to provide a certain level of lubrication to aid in the process. For both rock slides and rotational slips, the main requirement is the presence of a failure plane where materials move in a coherent mass.

In such a case, water may not play an extremely essential role in the mass movement process.

- Secondly, as in the case of heave, if the cause of heave is largely due to large temperature changes, then the role of water in such an instance may not be that important.
- May also want to mention rock slides.
- Similarly, the role of water in falls in tropical regions is also not directly important. In the case of falls, it is dependent on the presence of lines of weaknesses present in rocks that eventually break away from the parent rock and falls through the air. The role that water plays many not be so direct. However, water may also be seen as important as it may carry out physical and chemical weathering processes along the rock joints and in time to come, cause the rock joints to widen and break away from the parent rock.

## The role of other factors

- Other factors may also be responsible for contributing to mass movements. For example, in the event of an **earthquake**, the likelihood of mass movements may become more likely. When earthquake occurs, due to the intense shaking of the ground surface, the cohesive strength of the particles may be lost, more lines of weaknesses may also be created, causing the likelihood of rock falls and rock slides more likely.
- Clearing of vegetation might also make mudflow and debris flow more likely when bare surfaces are exposed to rain and resulting in oversaturation of the soil.

# **Conclusion**

- Recognise the important role water plays
- Also sought to recognize other factors and how water may not be important.
- Discusses how water may not be essential for all mass movement types.

Level	Marks	Descriptors
5	17-20	Response displays good synoptic links with content materials from other topics through synthesis. Evaluative elements are convincing and well thought out. Grasp of subject matter is impressive with use of detailed and accurate knowledge and accurate use of terms.
4	13-16	Response has a good evaluative element and good knowledge of the subject content. There is accurate use of terms and examples are used well in aiding the arguments put forth.
3	9-12	Response is broadly evaluative. There is acceptable breadth and depth in coverage in the discussions. Use of terms/concepts is generally accurate and there is some use of examples to illustrate arguments. Responses which feature only 1 country example cannot go above this band.
2	5-8	Response is largely descriptive rather than evaluative. It is generally relevant to the question but concepts/discussion tend to be less clear. Weaker responses here lack breadth or depth in coverage.
1	1-4	Response is fragmentary, lacks relevance and focus to the question. Arguments made are inappropriate to the demands of the question. There is much evidence of inaccuracy in use of terminology.
0	0	No creditworthy response.

## Question 2

## Explain the different factors that affect the shape of storm hydrographs. [12]

\*\* As a general guide, students should give factors coming from at least 2 categories. They need not talk about all factors but a good explanation will be needed. For 9 marks, at least minimally cover 5 factors while for 12 marks cover 6 factors

#### Indicative content:

#### **Climatic Factors**

	Effect on hydrological processes	Implication on hydrograph
Rainfall intensity	<ul> <li>High rainfall intensity can quickly generate high amounts of HOF</li> </ul>	Steep rising limb, short lag time, high peak discharge
	<ul> <li>Low rainfall intensity would allow infiltration but would not be able to generate HOF easily</li> </ul>	Gentle rising limb, long lag time, low peak discharge
Painfall	<ul> <li>Prolonged rainfall saturates the ground and tends to generate SOF</li> </ul>	Steep rising limb, short lag time, high peak discharge
duration	<ul> <li>Rainfall of short duration may add to soil moisture but may not lead to saturation of the ground. Thus, little or no SOF may be generated.</li> </ul>	Gentle rising limb, long lag time, low peak discharge
Evapo- transpiration	<ul> <li>Low rates of evapotranspiration results in high antecedent moisture (i.e. moisture present in the soil before rain event) and thus encourages the development SOF.</li> </ul>	Steep rising limb, short lag time, high peak discharge
rate	<ul> <li>High rates of evapotranspiration results in low antecedent moisture which promotes high rates of infiltration. This slows down the generation of SOF.</li> </ul>	Gentle rising limb, long lag time, low peak discharge
[Extra information]	<ul> <li>Rapid snowmelt (especially in summer) can quickly generate high volume of overland flows</li> </ul>	Steep rising limb, short lag time, high peak discharge
Snowmelt	<ul> <li>Slow snowmelt may only gradually generate low volume of overland flows</li> </ul>	Gentle rising limb, long lag time, low peak discharge

## **Drainage Characteristics**

	Effect on hydrological processes	Implication on hydrograph
	If a <b>basin is small</b> , it is likely that rainfall will <b>reach the</b> <b>main channel more rapidly</b> than in a larger basin. This is because the water will have a much further distance to travel in a larger basin.	Shorter lag time in smaller basins
Basin size	If a <b>basin is small</b> , the amount of <b>rainfall received</b> in the catchment area will also be <b>low</b> . This results in a lower amount of discharge in the main channel.	Low peak discharge
	<b><u>THINK</u></b> : If a small basin has shorter lag time and also lower peak discharge, will the rising limb also be affected by the basin size? (Hint: Draw the hydrographs and see!)	What is your conclusion? =)
	• In a circular basin, the tributaries often tend to come together and join the main stream <u>approximately</u> in the same place at the same time. Following a period of heavy rainfall, such 'centralized' merging of the streams results in a very large and very rapid increase in discharge of the main stream.	Steep rising limb, short lag time, high peak discharge
Basin shape	• In an <b>elongated basin</b> , the tributaries tend to be relatively short, and tend to <b>join the main stream at separate intervals</b> . This means that after a period of heavy rainfall, the runoff from the lower tributaries will reach the gauging station BEFORE the runoff from the upper tributaries finally flow down and reach the gauging station. It also takes a longer time for runoff from the upper reaches of the basin to reach the gauging station.	Gentle rising limb, long lag time, low peak discharge

	Influence of basin shape	
Drainage Density	<ul> <li>In a basin with high drainage density, a large proportion of rainfall will become overland flow (surface runoff). This leads to a higher and more rapid increase in discharge.</li> <li>In a basin with low drainage density, a large proportion of rainfall will most likely infiltrate and percolate into the ground. A small proportion of the rainfall will be channeled as overland flow. This leads to a smaller and slower increase in discharge.</li> </ul>	Steep rising limb, short lag time, high peak discharge Gentle rising limb, long lag time, low peak discharge



# Presence of Vegetation

	Effect on hydrological processes	Implication on hydrograph
Vegetation cover	Leaves and branches increase the rate of interception, which reduces the rate of soil compaction caused the impact of falling raindrops. This increases infiltration rate! At the same time, the roots of plants and trees increase the lines of weaknesses in the ground, further increasing infiltration rate. As such, the presence of vegetation cover generally leads to decreased amounts of surface runoff (due to increased infiltration rate).	Gentle rising limb, long lag time, low peak discharge + Gentler falling limb (since higher infiltration leads to increased throughflow and baseflow)

# **Geological Factors**

	Effect on hydrological processes	Implication on hydrograph
Soil or rock permeability	<ul> <li>Impermeable rock or soil reduces infiltration and percolation, resulting in the generation of high volume of overland flow.</li> <li>The reduction in infiltration and percolation also decreases the amount of throughflow and baseflow into the river.</li> <li>Permeable rock or soil facilitates high infiltration and percolation, reducing the occurrence of overland flow.</li> <li>Instead, because of high infiltration and percolation, rainfall reaches the stream primarily via throughflow and baseflow.</li> </ul>	Steep rising limb, short lag time, high peak discharge + Steeper falling limb Gentle rising limb, long lag time, low peak discharge + Gentler falling limb

# **Human Factors**

	Effect on hydrological processes	Implication on hydrograph
Dams and reservoirs	Dams DO NOT affect the amount of surface runoff <u>generated</u> , BUT they <b>regulate the flow of water</b> and are also able to <b>store a sizeable volume of water</b> in their	Lower peak discharge

	reservoirs. Generally thus, dams reduce the amount of discharge into the main river or channel.	
Deforesta- tion	The <b>reduction of vegetation cover</b> produces the opposite effects to what was mentioned in the above section on "Vegetation Cover". Generally, reduction in forest cover leads to: <ul> <li>Reduced infiltration rate</li> <li>Higher surface runoff</li> </ul> <li>[Note: <u>Afforestation</u> is the counter-process to deforestation, and INCREASES vegetation cover.]</li>	Steep rising limb, short lag time, high peak discharge
	Urbanisation produces large amounts of <b>impermeable</b> <b>surfaces</b> made of concrete, tarmac, and metal. Water cannot infiltrate through such materials, and this leads to a rapid generation of surface runoff.	Steep rising limb, short lag time, high peak discharge
Urbanisation	Moreover, <b>drains and canals</b> carry water more quickly to the nearest river.	
	As a result, rainfall reaches the river extremely quickly, greatly reducing lag time and also massively increasing peak discharge.	



b) "The causes of floods are mainly attributed to human rather than natural causes."

# Discuss the validity of this statement. [20]

Causes of floods may be attributed to both human and as well as natural causes. However it must be noted that the factors have to be direct factors. Factors such as urbanisation and deforestation can be discussed but only serve as factors contributing to worsening (acerbating factors) and should not be discussed as direct causes of floods.

#### Indicative content:

#### Natural causes of floods

Intense rainfall and tropical cyclones

- Intense rainfall will result in **infiltration-excess flow (IEF)** where rainfall intensity exceeds the infiltration capacity of the ground.
- The increase in IEF causes river discharge to increase, and this can lead to the formation of floods.
- High rainfall intensity is associated with **convectional rainfall** and especially in tropical regions. The formation of **tropical cyclones** also generates short but intense rainfall.
- Also, during intense rainfall, the impact from falling raindrops tends to compact unvegetated soil particles, and cause the pore paces to be sealed (recall: raindrop effect). This reduces infiltration capacity, further increasing the likelihood of IEF being generated.

Prolonged rainfall

- Prolonged rainfall leads to the increase in soil moisture storage and groundwater storage via infiltration and percolation respectively. The ground eventually becomes saturated with water, and over time, saturation overland flow (SOF) is generated.
- The increase in SOF causes river discharge to increase, and this can lead to the formation of floods.
- Prolonged rainfall is usually experienced in **tropical monsoon regions**, during the wet (monsoon) season.

Seasonal rainfall during wet season (monsoon season)

- **Tropical monsoon regions** usually experience a distinct wet season or monsoon season, where there is a higher amount of rainfall. These regions typically experience prolonged rainfall (see above) in the wet season, which generates SOF.
- Most of the time, countries in such regions are prepared for the increased rainfall during the wet season. However this seasonal increase in rainfall can still lead to the formation of floods, especially if:
  - The wet season is unusually long or extended
  - The intensity of rainfall is higher than expected
  - The wet season arrives much earlier than expected
- The above 3 cases tend to result in **tremendous increases in discharge**. Rivers that are unable to cope with such large increases in discharge will therefore overtop their banks and flood the surrounding area.
  - Eg: Brahmaputra River in India and Bangladesh and Yangtze River in China are prone to flooding during the monsoon seasons. In India, up to 70% of the annual rainfall occurs in 100 days in the summer south-west monsoon

#### Snowmelt

- **Snowmelt or meltwater** can **greatly increase the discharge** in the river, and cause the river to overflow its banks and flood.
- Snowmelt can be generated by:
  - Warmer temperatures during spring/summer
  - Volcanic events
- In the spring or summer months in temperate regions, warmer temperatures can cause snow or ice to melt, producing large amounts of meltwater.
  - E.g. In December 2008, the state of Washington (USA) experienced heavy snowfall. By January 2009, the heavy snowfall began to rapidly melt, producing enormous amounts of meltwater and generating extremely heavy floods.
  - E.g. In the Yukon River in Canada, the most common cause of flooding is the melting of snow and ice in spring.
- Rising magma can heat up the sides of a volcano, causing ice and snow on the flanks on the volcano to melt. Lava flows and hot gases from volcanic eruptions can also melt snow and ice, and generate meltwater.
  - E.g. The 2010 volcanic eruption in Iceland produced devastating flash floods, as hot gases from the volcanic eruption melted huge chunks of ice from the Eyjafjallajokull glacier.
  - E.g. The 1985 eruption of the Nevado del Ruiz volcano in Columbia melted ice and snow on the sides of the volcano, producing devastating floods and lahars.

#### Storm movement

• Storm movement in a catchment area can either amplify or dampen a flood wave.

- Storms that **move down-valley** (i.e. moving from the upper reaches of the basin to the lower reaches) are more likely to cause flooding. This is because such direction of storm movement tends to **amplify the peak discharges downstream**.
  - E.g. The disastrous 1996 flash flood that occurred in Buffalo Creek, Colorado (USA) was due to 2 reasons. Firstly, a severe wildfire caused extensive deforestation in the basin, leading to reduced infiltration and increased surface runoff. Secondly, the storm (that produced the surface runoff) moved down-valley, tremendously amplifying the peak discharges, and hence causing a severe flash flood.

#### Unusual climatic phenomena

- Climatic phenomena such as El Nino and La Nina have resulted in unexpected occurrences and amounts of rainfall and these have, in some cases, resulted in floods.
  - El Nino Said to have played a role in the 1993 Mississippi River flood.
  - La Nina Said to have played a role in the floods in Sudan and Bangladesh in 1998

#### Human causes of floods

Dam failure

- Dams are able to **regulate the flow** of water to the downstream areas, providing them with water even during the dry seasons.
- However, dams are also causes of floods if they fail or collapse.
- Dam failure can occur due to:
  - Unexpectedly-high amounts of rainfall
  - Sedimentation in reservoir
  - Engineering failures
- <u>Unexpected rainfall</u>. The reservoirs behind dams store water during the rainy season (this water is typically released during the dry season). However, in some cases, the rainy season experiences an unusually high amount of rainfall. The reservoir **may not be designed to hold such a large amount of water**, and the reservoir overflows. Downstream areas receive a sudden surge of water, and flooding occurs.
- <u>Sedimentation in reservoir</u>. Improper maintenance of the dam may lead to the accumulation of sediments in the reservoir. This reduces the holding capacity of the reservoir. When this happens, the reservoir is unable to hold large amounts of water, and the dam is more likely to overflow during times of heavy rainfall.
- <u>Engineering failures</u>. In some cases, **leakages** in the dam structures cause the dam to release water too quickly. In more severe cases, engineering failures may cause the dam to even collapse. In both circumstances, downstream areas receive a sudden surge of water, and flooding occurs.
  - E.g. Banqiao Dam, China
  - E.g. Teton Dam, USA
  - E.g. Val di Stava Dam, Italy
- \*\* Students can also bring in or feel free to talk about recent case study of dam failure in Laos (2018) which resulted in flooding downstream and loss of lives

#### Levee failure

- o Levees refer to embankments on the river bank. Levees can be natural or artificial.
- Artificial levees are built to increase the holding capacity of the river channel, and thus prevent overflowing of the river.
- However, levees are also causes of floods if they fail or collapse.
- Levee failure can occur due to:

- Overflowing of levees,
- Breaching or collapse of levees.
- <u>Overflowing of levees</u>. In some cases the amount of discharge is extraordinarily high (due to high rainfall or other circumstances), and **far greater** than what the levees were **originally designed to contain**. This causes the river to overflow the levees, and flood the surrounding areas.
- <u>Breaching or collapse of levees</u>. Increased discharge in the rivers also leads to both increased velocity and increased fluid pressure in the channel. Firstly, the increased velocity can increase the rate of **erosion at the base of the levee structure**, causing it to collapse. Secondly, the increased fluid pressure against the levees may also force water to "**breach**" **the levees**, eventually causing the levees to collapse.

## Other contributing reasons though not direct reasons to floods:

- Deforestation
  - Deforestation can worsen floods by increasing surface runoff as soil becomes compacted due to removal of trees and vegetation → Increase in IEF → Water reaches channel faster → increase in channel flow → Water overflows channels → flooding
  - Can also increase erosion → Mass movement → holding capacity of river is reduced → flooding occurs due to reduced capacity of river
- Urbanisation
  - Concretised surfaces → Impermeable surfaces → Higher IEF→ Water reaches channel faster → increase in channel flow → Water overflows channels → flooding
- Pluvial floods in Urban areas
  - Water may sometimes be channelled to low points in the city's terrain (also known as 'ponding') → This may happen if drainage systems are choked or rainfall is too intensed. Can happen as most urbanised areas have little permeability

# Section B

# Question 3

(a)	Explain the impacts of the TNCs on host economies of countries at	[12]
	low levels of development.	

# 1. Economic Impacts

# a) Positive & Negative on Host Economies

Positive		Negative
<u> </u>	Aid in the structural shift of economies	Most of the negative impacts will be affecting
Ũ	especially NIEs such as Singapore in the	the long-term health of the local economic
	past when we wanted to move from an	sector:
	industrial to post-industrial economy	<ul> <li>Local firms might be under-</li> </ul>
	through the following:	developed due to the superiority
	through the following.	of TNCs in terms of their
(4)		
(1)	Employment:	financial alvilla. Depail how TNCs
0	Number of Jobsdependent on the scale	Inancial skills. Recall now TNCS
	of TNC operation, whether it is capital or	are able to provide higher wages
	labour-intensive	to attract local talent. Smaller
0	I ype of jobslevel of development of	firms might be forced to close
	host country labour and compatibility with	down, stifling the prospects of
	the operations of the TNC, DCs tend to be	local enterprise skills. Some can
	able to take higher-order skilled jobs that	consider this as positive point, as
	pay more. We also need to consider	some local firms or state-owned
	whether the jobs are indirect or directly	enterprises are kept 'alive' due to
	created by the TNC.	state subsidies but are in fact not
		doing well. TNCs provide more
0	Wage and salary level: The type of jobs	equal competition and might
	will determine the wage levels. Higher	provide more 'incentive' for local
	skilled jobs will tend to be paid more.	firms to be more productive and
	However, TNC tend to be pay higher than	efficient.
	the host economies because of their	<ul> <li>Dependency: The over-</li> </ul>
	wealth levels they tend to pay higher than	dominance of the TNC in the local
	local prices so as to recruit more capable	economy leads to another
	workers to give them more edge since	problem. This will depend on the
	they are deemed to be a foreign company	nature of relationship between the
	and has no home-ground advantage	TNC and host economy and their
	compared to the local companies.	contrasting level of development.
		If the host country is a LDC and
0	<b>Time frame:</b> Another consideration is	the TNC main aim to locate in this
Ũ	whether the jobs created are for the long	I DC is due to low labour cost
	term or for the short term. This is	there is a high risk of the TNC
	dependent on how long the TNC stays in	relocating to another country if
	the country	they are able to provide more
	and obtaining.	competitive labour costs <b>[This</b>
(2)	Technology:	situation of TNCs relocating
(4)	Extent of transfer: Technically if the TNC	frequently to the lower wages
0	employs local labour, there will be some	countries is termed 'caravan
	dogroe of transfer through skills and	conitalism' To provent pogetive
	techniques. However, the TNCs tend to	imposto quob as aconomio
	limit their transfer of technology, they tend	line the role of
	to transfer the results of innevation but not	reakages the role of
	in ansier the results of innovation but not	government is very important,
	hut not the 'know why' This is suident as	this will be discussed in Lect 6
	most TNCs lessts their D & D surrest	A citer of broth driver entermines
	Inost TNUS locate their K & D Support	aner-an pront-onven enterprises,
	laboratories in their nome country. This is	aepenaing on the scale of
		operation in the nost economy this

to keep their competitive edge over other countries.

- <u>Appropriateness of the technology</u> <u>transfer:</u> Also many LDCs do not have the necessary infrastructure or skilled labour to optimised the technology from the DCs.
- Most TNCs are from DCs and their technology is largely capital-intensive, LDCs tend to be capital scare and labourintensive, hence these means fewer jobs will be created, hence extensive transfer of technology in this case might not be suitable.

# (3) Capital and finance:

 TNCs will channel high inflows of capital directly via FDI or indirectly via corporate taxes. This will also depend on how 'shrewd' the host economy is to prevent economic leakages via remittance back to TNC's home country, some host economies will implement taxes on the profits of TNCs or have legislation stipulating that TNCs reinvest a certain amount of their profits back to the local economy.

# (4) Trade Balance:

 Positive trade balance/Surplus (More exports than imports) TNCs may practice import substitution, the plant that they set up in the host economy produces goods for the local population so that the host economy does not need to import from other countries. Domestic firms which are vertically integrated into the TNC's activities via its production network would also be able to gain access to new export markets.

# • <u>Negative trade balance/deficit</u> (More outflow of funds through <u>exports</u>)

Imports by TNCs, although this may be offset its imports are essential for export-producing activities.

**Note:** Trade balances can be studied via the volume and values of the imports and exports. It would be more accurate to look at these two variables.

would lead to massive economic revenue loss and employment.

- Local economies have to pay for development of infrastructure like roads and railways to attract FDI. The money would be a significant strain on some of these lessdeveloped countries.
- Other sectors of the economy might be over-looked as the government channels all its revenue to attracting TNC foreign development.

# Host Economies

Positive Impacts Negative	Negative Impacts	
<ul> <li>Creation of jobs and higher pay in LDCs, this seems like a direct economic impact. However, with income generated from employment, they could be channeled to social infrastructural development such as building schools and better hospital facilities. Some form of 'trickle-down effect' or multiplier effect might be generated. For instance, when the population is gainfully employed, they can use the income to buy goods and services from local retailers and generate income for the local economy.</li> <li>Skill levels of the local population may rise through training by the TNC. This can be considered an economic impact but it can also have long-term social impacts where the labour is seen to be more attractive to investors in the long term.</li> <li>Social development projects &amp; engagement with local communities e.g. microfinance &amp; healthcare programs set up by TNCs to aid the local communities. E.g. Citigroup microfinance program which provides financial aid to poor families to start small businesses. These projects have helped to improve the overall standard of living in the country.</li> <li>IN.B: Some critics have said that these projects are merely publicity stunts by TNCs to improve their corporate image that has been tarnished by bad press reports about</li> </ul>	Exploitation of local labour force: TNCs have been accussed of setting up sweat-shops with poor working conditions for local workers. Such ill- practices include long working hours, poor wages, under-age employment as well as fines for simple mistakes. As most of these LDCS have little job opportunities, many workers are willingly to endure the poor working conditions. Instability of jobs as TNCS is prone to closing plants if greater profits can be made in other countries. Limited skill transfer: There might be minimal transference of skills because workers are not expected to do high level skills. Hence workers do not upgrade their skills in anyway. Entry of values which might have harmful social and moral effects E.g. entry consumerism and materialism. Nestle introduced formulae milk to LDCs but because the natives do not have the necessary sterilisation equipment and hygiene standards, many of the children developed health problems from milk bottles that were not sterilised properly. Lost of local cultural heritage through the invasion of foreign culture e.g. the setting up of Starbucks in the Forbidden City in Beijing.	

# Environmental Impacts on Host Economies

Positive		Negative	
•	Solving environmental problems: Capital inflow of FDI could be used to solve environmental problems that LDCs usually face.	0	Loss of Greenfield sites due to construction of factories. World total Greenfield FDI projects increased from 9,300 in 2003 to 9,800 in 2004.
0	However, these gains could be negated by corruption.	0	<b>Pollution:</b> Industries can produce untreated waste and air pollutants. Pollution could lead to adverse impact

o T ir s c	NCs have capital and technology to mplement environmental practices and chemes. Such as fitting cars with atalytic converters or having hybrid		on health of residents. Respiratory problems could result from the pollutants.
c	ars that run on less pollution.	0	Poor Environmental Management: Many LDCs lack the resources and manpower in environmental regulation, legislation & enforcement. Hence, they are unable to penalise the TNC's when they violate the regulations. Also, the main aim of these LDCs is still economic profit and maintaining their attractiveness to investors. What they perhaps are thinking is only for the short term gains because in the long-term, pollution could affect the health of the workers leading to poor work productivity. Over-consumption of resources could also lead to shortages which might compromise future economic development of the country.

(b)	'TNCs plays the most important role in the economic development of the country.'	[20]
	Assess the validity of this statement with reference to countries at low levels of development.	

Economic development usually attained through economic planning and executing economic			
	and global hab for business of investments		
TNCs play the most important role	TNCs does not pay the most important role		
<ul> <li>TNCS is most important as:         <ul> <li>The state is unable to counter regional imbalance in economic development</li> <li>E.g. developed core and underdeveloped periphery</li> </ul> </li> <li>TNC is important         <ul> <li>The sheer scale, structure, global nature of the geographical spatial distribution and the diversity of sectors that TNCs are involved in ensure that it has the ability to dominate a particular national economy</li> <li>Aid in the structural shift of economies especially NIEs (in the past) and LDCs today (from an industrial to post-</li> </ul> </li> </ul>	Role of state is key in the economic development of the country         ○       The government's main economic objective is to protect domestic markets and foster economic growth. It also aims to regulate foreign investment, industry, and trade. The government can achieve this in the following ways:         ✓       Creating a favourable business climate         ✓       Promoting industrial development         ✓       Promoting trade         ○       Maintaining social and political order in a country         ○       Industrial Development <-> cumulative causation &multiplier effect		

<ul> <li>industrial economy) through employment numbers and type</li> <li>Assists in some degree of transfer through skills and techniques</li> <li>TNCs will channel high inflows of capital directly via FDI or indirectly via corporate taxes</li> <li>TNCs may practice import substitution- increases trade balance</li> </ul>	<ul> <li>✓ Export Processing Zones (EPZs)</li> <li>✓ Industrial clusters</li> <li>○ Providing economic incentives</li> <li>✓ Import substitution policies</li> <li>✓ Protected home markets via tariffs and quotas on imports</li> <li>✓ Tax incentives</li> <li>✓ Cheap labour</li> <li>✓ Encouragement of inward investment and development of their own TNCs</li> <li>○ Provide public goods and services</li> </ul>
	The role of supranational bodies is
	Role of international
	organisations
	<ul> <li>✓ Facilitate world trade and fair trade practices (especially for LDcs)</li> <li>✓ Trade negotiations</li> <li>✓ Promoting the process of trade liberalization</li> <li>Role of trade blocs</li> <li>✓ Increased trade and export earnings.</li> <li>✓ Stimulus for FDI</li> <li>✓ Increased competitiveness of businesses</li> <li>✓ Increased regional and national development</li> </ul>

# Question 4

# (a)Explain the impacts of extractive industries [12]

Production of Spoil

- **Spoil** refers to the waste produced when ore is obtained from the mined material.
- Large mines produce large amounts of waste because the ore is only a small fraction of the total volume of the mined material
- The production of spoil is an increasing problem because:
  - (a) Of the growth in demand for minerals (especially to fuel the economic development of fast growing economies such as India and China)
  - (b) As rich ores are mined out, lower-grade deposits are worked, producing even more waste per unit of mineral produced. For example, four centuries ago, the average grade of copper ore

mined was about 8%. Now the average grade is 0.9%, which means almost 1 billion tonnes of waste is generated to produce 9 million tonnes of copper.

- Deposition of spoil during mining can bury streams and rivers. This has a serious effect on streamwater quality and wildlife habitats.
- When spoil is piled into tall heaps, it can create geomorphological hazards such as **landslides**. This is because the added weight of the spoil on slopes can result in shear stress exceeding the shear strength of the slope. A catastrophic landslide that occurred at the Gyama copper/gold mine in Tibet in March 2013 killed 83 workers.
- Moreover, disposal of spoil often degrades areas of natural ecosystems beyond the immediate zone of impact of the mining areas.

**Environmental pollution** 

(a) Air pollution

- This can result from the hazard of **self-ignition**.
- It is associated with the waste rock heaps deposited by the oil-shale mining industry in Estonia. Once these are ignited, the average burning period of mine spoil is about 10 years.
- The town of Baotou in Inner Mongolia, China has suffered from air pollution as a result of the processing of rare earth elements (RREs) at a mine 120 km away. 9600 to 12 000 m<sup>3</sup> of waste gas, containing dust concentrate, hydrofluoric acid, sulphur dioxide and sulphuric acid are released with every tonne of rare metals that is mined.
- Residents have started to suffer from breathing difficulties and liver and pancreatic diseases caused by the polluted air.
- Moreover, the energy used to process the rocks comes from a coal-fired power station. Sulphur dioxide and carbon dioxide released by burning coal contribute to air pollution and global warming.

(b) Water pollution

- Using the same example of the mining of RREs in Baotou above, given that the concentration of rare earths in the ore is very low, they must be separated and purified using hydro-metallurgical techniques and acid baths.
- However, the toxic and radioactive waste products of this are contained in large ponds known as tailings which have not been properly sealed.
- Chemicals have seeped into the surrounding land and into the groundwater, contaminating the soil and damaging farmland. Farmers have been forced to abandon their land and move away, with difficulties in obtaining compensation.

- Another form of water pollution associated with mining is **acid mine drainage**. This occurs when any deposit containing sulphide reacts with air and water to produce sulphuric acid. If sulphuric acid reaches rivers, the damage to plants and animals can be very serious.
- Acid mine damage is a problem of operational mines as well as being a pollution source for some years after mine closure.
- For example, the Sao Domingos mine in southern Portugal, which produced copper and sulphur for more than 100 years, was closed in 1966. However, it still continues to pollute rivers that flow into the largest drinking water reservoir in the province of Huelva.
- Another water pollution issue is that of **mercury pollution**.
- This is especially common in areas mined for gold by small-scale prospectors. Mercury is used to separate fine gold particles from other minerals in river-bed sediments, but is an extremely toxic metal.
- Although large-scale mines have since used more efficient and less environmentally damaging techniques in gold processing, mercury pollution can be long-lasting.
- For instance, the use of mercury in the 1950s and 1960s at the Discovery mine in the Canadian Northwest Territories polluted nearby Giauque Lake, which is still designated a contaminated site by Environment Canada, decades later.
- When contaminated water held in ponds at mines are accidentally released prior to treatment, they can cause much damage to the environment.
- The 1998 Aznalcollar mining accident in southwest Spain severely affected one of the most important bird-breeding and over-wintering sites in western Europe, the Coto Donana nature reserve. The release of acidic wastewater killed large numbers of fish and had severe consequences for the many bird species dependent on the nature reserve and adjacent areas.

# Habitat and landform destruction

- Mining e.g. surface mining can involve the removal of surface vegetation, soil and where necessary, layers of bedrock in order to reach buried ore deposits.
- However, this has serious effects on ecology. Large amounts of soil and rock have to be moved and this destroys habitats and landforms.

# Land subsidence

- Land subsidence most often occurs in coal mining, when whole seams of material, frequently several metres thick, are removed. The overlying strata may then collapse downwards. This may happen rapidly and with little warning, or occur gradually over a period of time.
- Subsidence can be in the form of:
  - (a) Crown holes: localised crater-like holes that appear at the surface following collapse of strata into a mine.

- (b) General subsidence: settlement of the ground surface over a wide area resulting from the collapse of part of the mine.
- Subsidence can cause damage to mining equipment, buildings, communications and agricultural drainage systems. The issue may be worsened by the reactivation of geological faults in the area, causing fault scarps to form. Examples in the south Wales coal field are up to 4 metres high and several kilometres long.

#### \*\* Students minimally must discuss 3 points from at least 2 categories

#### b) Using examples, evaluate strategies used to prevent the resource curse. [20]

#### Introduction:

- Brief statement on what the resource curse is
- Give brief background on selected examples e.g. Botswana is blessed with diamond wealth, Norway is blessed with oil wealth, yet both have avoided the resource curse. Describe changes in development indicators of Botswana to show this.
- Indicate stand: the strategies in Botswana and Norway's cases are effective as they enable the countries to manage their wealth from minerals in a sustainable manner that extends into the long term. However, these are not effective per se. Their effectiveness have been contributed by the contextual conditions that promote good governance and transparency as well.

#### Main Body:

One strategy pursued by Botswana was economic diversification. To promote this, the Business and Economic Advisory Council (BEAC) was created in 2005. It was tasked to identify constraints hindering economic diversification, formulate a key strategy and action plan to overcome those constraints and identify projects for Botswana to move forward.

Since the implementation of the action plan produced by the BEAC, Botswana's economic diversification focussed on creating a business friendly environment – there are no foreign exchange controls and there are few non-tariff barriers to imports. Taxation is favourable with a standard income tax rate of 25% for individuals and 15% for manufacturing and international financial services. Moreover, there is the provision of the structures and incentives that serve to improve Botswana's business capacity through training and business development efforts. Other measures include addressing policy and institutional matters such as ensuring the stability of the financial sector, providing instruments of support for diversification initiatives including the promotion of privatisation and creating projects to drive diversification through the support of agriculture and tourism among other sectors

The reasons for behind economic diversification were the danger of relying on the mineral sector for the majority of revenue as it renders states very susceptible to the price shocks of the sector they depend on. Furthermore. mineral wealth was limited in that the wealth acquired from mining would only last as long as there were diamonds in the ground. Lastly, it was important for Botswana to develop the non-mineral sectors given the narrow linkage of the mining sectors with the rest of the economy, especially in employment creation. The sector only directly employs 2% of the labour force.

However, this strategy may not be a total success, at least not at this point in time. This is because the homegrown private sector remains weak while the key targeted sectors notably manufacturing have not fully yielded intended results. Nonetheless, this strategy can be said to help Botswana avoid the resource curse as signs of success of economic diversification include manufacturing contribution increased from 8.5% to 11.4% in 2001. In addition, manufacturing output at independence comprised mainly meat and meat products. These accounted for only 14% in 2001 while other consumer goods comprised 35% of output and the intermediate goods, 51%.

Another strategy used by both Botswana and Norway was the use of sensible fiscal rules to curb excessive spending and to promote the sustainability of mineral wealth. In Botswana's case, one rule was that of sustainable budgeting that aimed to ensure that all mineral revenue be invested productively or saved rather than be used for consumption. This rule led to the creation of the Sustainable Budget Index (SBI) – defined as the ratio of non-education, non-health recurrent expenditure to non-mining revenue. A SBI of no greater than unity (1 to 1) is targeted in order to ensure non-investment expenditure to be financed by non-mineral revenue and conserve the country's wealth. Another fiscal rule sets the maximum government expenditure at 40% of GDP to be consistent with the projected medium-term government revenue. In addition to limiting expenditure, it should be noted that they are also focused on increasing the productivity of revenue spent and limiting debt.

In Norway's case, this was seen in the Fiscal Rule introduced in 2001 to ensure that a large part of the oil revenues was saved. The gist of this rule was that the spending of the oil revenues should be equal to the expected real return from the Pension Fund. Thus, the fund would grow when new oil revenues flowed in, but as one would only withdraw the expected return, the fund would never be smaller. This rule would enable the government to run with a permanent non-oil budget deficit, allowing for higher public spending and/or lower taxes than would be possible without the oil revenues. Thus, the Pension Fund and the fiscal rule would ensure that the large, volatile and temporary net cash flow from the petroleum sector is transferred to a stable supplement to the government budget. In essence, through this rule, the oil revenues allow higher public spending and/or lower taxes than would otherwise have been possible for the entire future. The fiscal rule had 2 other objectives – to avoid fiscal policy affected by the boom-bust cycle associated with mineral commodities and to mitigate the costs when spending of the oil revenues increases. If followed, the fiscal rule will ensure that the spending of the oil revenues will last forever, to the benefit of both current and future generations. When the direct revenues from petroleum production diminish in the future, this will be compensated by the return from the Pension Fund.

Thus, as can be seen above, the fiscal rules pursued by both Botswana and Norway can be said to be helpful to both countries in avoiding the resource curse as they seek to preserve the mineral wealth for future use as well as avoiding levels of expenditures that correspond to the boom-bust cycles of mineral commodities that is detrimental for good economic management.

Another strategy pursued by both governments is investing their mineral wealth in a sovereign wealth fund. In Botswana, this was seen in the creation of the Pula Fund in 1993. The objective of the fund was to provide greater flexibility in the management of international reserves and greater certainty in the forecasting of annual dividend payments to the government from the Bank of Botswana. The Pula Fund has 2 functions. Firstly, it was a stabilisation fund. This takes previous years' fiscal surpluses and saves them in the Government Investment Account. This account is then used to finance fiscal deficits. Secondly, it was a savings fund for future generations. This is the intergenerational equity fund to ensure that the mineral revenues are invested in such a way that future generations can also profit from the resources, even after it has been depleted. The success of this fund can be seen in its assets reaching US\$7 billion in 2008.

In Norway, this strategy was reflected in the creation of the Pension Fund. In relation to this fund, all government net revenues from the petroleum sector would be transferred to this fund.

However, the fund would be integrated in the ordinary government budget, so in case of a deficit in the ordinary budget, there would be an automatic deduction from the Pension Fund. This was so to avoid the situation where politicians could "pretend" that they were saving in the fund, while at the same time borrowing to finance the ordinary budget spending. Another characteristic was that money from the fund could only be used on the ordinary government budget. Thus, it could not be used to finance purposes which were not given priority in the ordinary budget procedure in the parliament. Thirdly, wealth from the fund should be invested in foreign assets. This served the dual purpose of both providing currency income from the return on the assets as well as avoiding increased investment in Norway that can push up the already high Norwegian cost level. This strategy can be said to work well for Norway as the return from investment using wealth from the Pension Fund has been fair, with an average annual real return above management costs of 3.25% during the period 1998 until April 2013.

Nonetheless, the effectiveness of these strategies have been aided by contextual conditions in both countries that have promoted good governance and the associated traits of transparency and accountability, without which the effect of these strategies may have been less beneficial.

In Botswana, this is seen in the creation of the National Development Plans involving a consultative system of committees that include members of civil society as well as senior political offices. These include the House of Chiefs, which include 8 hereditary tribal chiefs in matters pertaining to the review of parliament decisions. By continuing the Tswana tribal tradition of consultation, it enabled Botswana to be transparent and accountable, especially on government officials. Moreover, the consultative approach created a degree of trust in the government – the sense that government exists to serve the people and promote development and is not the instrument of one group or individuals for the purpose of getting hold of the wealth. This transparency is also seen in how adherence to the National Development Plans are ensured by a rule that makes it illegal to implement any additional projects without going back to parliament once the plan has been approved. The plans therefore prevent the starting of projects for which no provision was made to cover the total costs over time. In relation to the Pula Fund, adherence to rules prevent the government from interfering in the investments of the funds as well as using its assets. Moreover, the country's requirement for parliamentary approval of changes to the budget had promoted the efficient management of the intergenerational fund.

In Norway, in relation to the Pension Fund, the central bank, Norges Bank was tasked with handling the fund. It was well-respected and had experience from managing currency reserves. Moreover, asset managers of the fund from the central bank are supervised by the bank's Control and Compliance Unit, which in turn is supervised and controlled by the bank's Executive Board and internal audit. Further up, the bank is supervised by the Supervisory Council as well as the Ministry of Finance. Finally, the latter is supervised by the Office of the Auditor General. Thus, there are many layers to ensure transparency and accountability.

**Conclusion:**Therefore, other than the effective strategies that had been crafted by Botswana and Norway, there is merit in stating the point that good governance promoted by the local context contributed to the effectiveness of the strategies pursued by both countries. Without this culture in place, regardless of how good the strategies may be on paper, the likelihood they will fail upon implementation becomes higher as they could be exposed to personal interests which may not necessarily be in line with the state's interest.

# Question 5

(a)

DC	LDC
1. <u>Influence over the world</u> <u>economy</u> Rise of important 'world' and 'global' cities with great economic and political influence internationally	<ol> <li>Uneven development &amp; under-development: Rise in mega-cities and primate cities and the negative backwash effects on the country. This could lead to uneven development and rural under- development in the LDCs.</li> </ol>
The good thing is they are trend setters but this could mean they would affect global economic trends as well. Could be targets of terrorism (e.g. NY Twin Towers & London Bombings)	<ol> <li>Speed of growth: Rate of urban growth is so rapid that it is 3 times faster than Europe when it first started urbanising. Measures by the government are not quick enough to compliment the rate of growth. However, this rapid and massive scale of urban growth has caused many problems such as the lack of housing; water sanitation facilities and many other problems for LDCs.</li> </ol>
2. <u>Over-concentration of</u> <u>global capital:</u> Cities have high concentration of financial services such as banking and international business. They might attract	<ol> <li>Size of Population (Scale of the problem) For every city-dweller in the DCs, there are 4 city- dwellers in the LDCs. The greatest numbers of large cities are found in LDCs. By 2015, 24 of the 30 largest urban agglomerations will be in LDCs.</li> </ol>
more investments compared to other countries.	<ol> <li>Lack of resources: The greatest challenge for the government of these poorer countries is to improve the lives of the people living in these cities, given the lack of resources and corruption levels in</li> </ol>
<ol> <li><u>Rising cost of living</u> negating the quality of life.</li> </ol>	LDCs. The LDCs are becoming urban before they attain a certain level of affluence and development levels associated with urbanisation. This could
4. Increasing Income disparity leading to residential segregation and social tensions.	mean massive social problems which will be shown in many forms of urban deprivations in later lectures of housing and social-economic polarisations.

# Strategies to manage non-hazardous solid waste in DCs and LDCs

# [Usually countries adopt a variety of strategies to manage non-hazardous waste]

# 1. Landfill

• Landfill is a very common waste disposal method but it is not a long term solution. Landfills have to be carefully designed to prevent contamination of

groundwater, air and land. Usually the sites are barren and non-productive brown-field sites.

- However, in many land-scarce urban locations, land is precious and expensive, the amount of land is limited and many landfills are running out of space. Once the landfill has exceeded its carrying capacity, it might not be able to be redeveloped as it could be toxic or polluted.
- In Singapore, for instance to reduce land for landfills, the government has been trying to look at other innovative means to reduce waste sent to the landfills. Pulau Semakau is a unique offshore landfill that is constructed in the sea and operated since 1999, about 200,000 tonnes of solid waste and all incinerated ash are sent to the landfill annually to 2035.
- The island covers a total area of 3.5 square kilometres and has a capacity of 63 million m<sup>3</sup>. The landfill is filled mainly with ash from Singapore's 4 incineration plants. The landfill was designed to be clean, free of smell and is actually quite scenic. Recreational activities are allowed on the island. And care was done during its construction to reclaim the sea into land, to reduce the damage done to the corals. The landfill is lined with impermeable membrane and clay and any leachate produced is treated a plant onsite the island. Regular water testing is also carried to ensure its safety to prevent leakages.

# [Used in combination with Taxes]

- In the UK, to reduce waste sent to the landfills, they have implemented a Landfill Tax since 1996.
- In Sweden, less than 1 per cent of Swedish household waste was sent to landfill last year or any year since 2011.
- There is a ban on landfill in EU countries, so instead of paying fines, governments have to look at ways to reduce the waste generated.

# 2. Incineration

- Incineration is the burning of waste at high temperatures. The process can release harmful emissions and gases into the atmosphere. Such emissions can be reduced via improving combustion techniques and fitting pollution control devices.
- The burning of waste to produce energy can be adopted in incineration.
- Incineration can also reduce mass of waste from 95-96%, hence reducing storage space in landfills that are fast filling up. Incineration merely reduces the waste sent to landfills but landfills are still needed.
- Sweden is a country known for its high ability to sort and recycle waste and its incineration plants lack garbage. The incineration plants produce electricity to supply 250,000 homes and heating for 950,000 homes.
- Since 1991, Sweden was one of the first countries to implement **a heavy tax on fossil fuels** and its incineration plants generates electricity from renewables.
- Incinerated ashes constitute 15 per cent of the weight of waste before burning. From the ashes, metals are separated and recycled, and the rest, such as porcelain and tile, which do not burn, is sifted to extract gravel that is used in road construction. **[Recycling]** About one per cent still remains and is deposited in rubbish dumps. **[Landfills]**
- The smoke from incineration plants consists of 99.9 per cent non-toxic carbon dioxide and water, but is still filtered through dry filters and water. The dry filters are deposited. The sludge from the dirty filter water is used to refill abandoned mines.
- The Swedish government also worked on educating the people to change their mindset and habits and **recycle and reuse**, to generate less waste.

- There has been a **national campaign** called "**Miljönär-vänlig**" who has been around for several years to promote **repairing**, **sharing and reusing**. **Recycling stations** are as a rule no more than 300 metres from any residential area. Most Swedes separate all recyclable waste in their homes and deposit it in special containers in their block of flats or drop it off at a recycling station.
- Swedish households sort their newspapers, plastic, metal, glass, electric appliances, light bulbs and batteries. They also separate food waste and all of this is reused, recycled or composted.
- Rubbish trucks are often run on recycled electricity or biogas. Wasted water is purified to the extent of being potable. Special rubbish trucks go around cities and pick up electronics and hazardous waste such as chemicals.
- They government has a cohesive **national recycling policy** that engages the **private sector** as well, where they import and burn waste to produce energy for the national heating network to combat the freezing Winters in Sweden.
- Other examples, private companies like H&M has begun accepting used clothing from customers in exchange for rebate coupons in an initiative called Garment Collecting.
- The Optibag company has developed a machine that can separate coloured waste bags from each other. People throw food in a green bag, paper in a red one, and glass or metal in another. Once at the recycling plant, Optibag sorts the bags automatically. This way, waste sorting stations could be eliminated.
- The southern Swedish city of Helsingborg even fitted public waste bins with loudspeakers playing pleasant music all in the name of recycling.

# 3. <u>Taxation</u>

- This method tries to deter waste production by passing the cost of waste management to the consumers. This hopes to reduce waste and increase recycling rates. Cost can be passed on to consumer by increasing retail products for its packaging. This method is also often combined with other methods such as **recycling**.
- For instance, the UK has this environmental tax called the Landfill Tax of 1996, where to avoid the extra cost, the country commits to reducing waste through industrial legislation and increasing the cost of disposing waste to landfills. However, UK has not been able to reduce the waste, hence to reduce the money they have to pay for the Landfill tax, the UK pays transport cost to have their waste transported to Sweden's incineration plant.
- The Landfill tax is also a means for the UK to reach the EU target that UK has committed to increase the percentage of waste generated in the country to 50% in 2020. UK hasn't reached their goal yet, recycling in the UK has peaked at around 45% in 2014. EU target is 65% of the waste be recycled by 2030.
- The UK government also has invested millions into recycling facilities and energy recovery plants. This also indirectly create jobs.

# 4. <u>Recycling & Recovery</u>

- In many LDCs, many rural-urban migrants have difficulty securing employment and many end up scavenging through waste sites to obtain any materials that they can sell.
- Also in many LDCs, due to the sheer population size and lack of proper waste facilities, much of the waste is disposed of on the streets and the sewers.
- To solve the issue which has socio-economic and environmental impacts, innovative means to incorporate these waste-pickers to their waste management schemes. In Buenos Aires, the government has legalized the informal garbage collectors recognizing their contribution to recycling and urban sanitation.

- In Bogata, waste pickers have formed co-operatives to bid for municipal waste collection contracts.
- Bandung has an 'integrated resource recovery' strategy for waste management based on co-operation between the municipal authority, NGO and a local community of scavengers. The program was able to help provide shelter upgrading, health-care provisions, toilet construction and various economic activities such as composting of organic waste and seed farming. The plan is to get aid from government such as tax incentives for industries.
- The key to sustainability it seems is to draw linkages between socio-economic and environmental goals.
- In DCs, there are more formalized recovery and recycling schemes for metals and other materials like paper and glass. For instance, in Germany, there are numerous recycling stations at supermarkets for consumers to return their plastic and glass materials for money.
- Recycling can reduce the amount of waste sent to landfills and incineration.
- Less raw materials are needed and this reduces negative pollution and conserves resources from future generation.
- This strategy also creates employment opportunities (economic) and have good environmental and social benefits.

(a)	Explain the reasons to account for urban re-imaging in countries at high levels of development.		[9]
	Causes		
	Economic Changes		
		Deindustrialisation & offshoring– global shift of manufacturing growth from the west to the LDC	
		<ul> <li>Move from manufacturing to tertiary industries (Tertarisation)</li> </ul>	
		<ul> <li>Decentralisation of industries out of congested cities to Greenfield sites and industrial estates on the periphery. Companies might find peripheral location cheaper or due to proximity to skilled labour in suburbs. High cost of development in CBD locations and peripheral locations offer lower costs.</li> <li>This also leads to suburbanisation as the rich move away from the city centre.</li> </ul>	
		Unemployment – especially for blue-collar workers, jobs might be also be more for females	
(b)	To what exten cities of count	It have urban re-imaging strategies benefited everyone living in the ries at high levels of development?	[16]

## **Question 6**

# Define Key terms:

► Urban Re-imaging strategies → 24 hour cities, flagship development project, heritage tourism & cultural tourism

(Re-imaging strategies are part of <u>Gentrification</u> efforts to project a better image of the inner city to attract investment back so as to reverse the negative effects of inner city decline)

## Gentrification projects aim to:

Redistribute income within the city through the 'trickle-down' effect. I.e. trickle down of benefits into the pockets of the most disadvantaged through job creation, servicing visitors and incoming visitors

- Increased consumer spending can spur the multiplier effect as other related and non-related industries develop
- Reverse urban decline via the promotion of economic vitality, improving social conditions, social integration, upgrading & improving physical environment of city
- <u>Causes of urban decline</u>
  - 1. De-industralisation
  - 2. Economic decline
  - 3. Suburbanisation
  - 4. Influx of migrants

Re-imaging hopes to bring back economic investments to the city centre, however, redistribution of income is not uniform.

## Negative effects of inner city decline:

# Economic, social and environmental decline

- Lack of services
- Unemployment
- Drugs and crime
- Urban decay
- Road congestion and pollution
- Lack of green space

# Suggested Thesis Points (Body): Using the case study of Sheffield

Benefits in terms of economics and physical infrastructure, likely to be benefiting only the middle class people.	Didn't really benefit the poor.
<ul> <li>Middle class people.</li> <li>Overall there has been a stunning transformation in the visual appearance of the area</li> <li>1.7 billion pounds of public sector investment attracted a further 6.1 billion of private sector investment, mainly in new businesses, office development and housing</li> <li>The population of the area increased from 39,000 in 1981 to 68,000 in 1995</li> <li>140 million was spent on reclaiming a total of 7 sq kilometres of derelict land</li> <li>950 million was spent on improving access to the area, including new roads, the Docklands Light Railway and the London City Airport</li> <li>The number of businesses located in the area increased from 1000 in 1981 to 2350 in 1995 and the number of jobs from 27,000 to 66,000</li> <li>19,000 new homes were built refurbished</li> <li>7700 council houses were refurbished</li> </ul>	<ul> <li>Most of the new housing is built with the encouragement of the LDDC; housing is very expensive and well beyond the reach of the original inner city residents. This has led to major gentrification</li> <li>Although 7,700 council houses were refurbished, relatively little was done for locals particularly in the early years of the LDDC.</li> <li>Most of the new jobs (in areas such as financial services and the media) need highly skilled or experienced people. Few opportunities have opened up for the relatively unskilled inner city residents</li> <li>The influx of highly paid professional population has increased socio-economic inequalities and highlighted the poverty in the social housing estates</li> <li>The rapid changes has destroyed the traditional close-knit 'Eastenders' community</li> <li>Inadequate public expenditure on transport infrastructure means that transport links to the area are inadequate.</li> </ul>
(	

## Suggested Points for Conclusion:

- Analyses that there are global, structural and systemic problems that re-imaging cannot fully
   address
- Re-imaging strategies are merely marketing strategies that change the physical landscapes via redevelopment but often they do not solve root problems of inner city decline of social inequality and economic restructuring

# A H2 Generic Level Descriptors for 12m SEQ sub-part (a)

Level	Marks	Descriptors
4	10–12	Response is consistently analytical and comprises purposeful explanations. Response addresses the question fully using accurate and detailed knowledge. Depth of relevant knowledge and understanding is evident throughout. Response is coherent and use of terminology is accurate throughout.
3	7–9	Response is analytical and explanatory rather than descriptive. There is a clear focus on the question. Response demonstrates relevant knowledge and understanding. The response is coherent and the use of terminology is mostly accurate.
2	4–6	Response includes analysis and explanation but is generally dominated by description. Response reflects understanding of the question and is generally relevant. Some parts of the response may be unclear. Use of terminology is limited.
1	1–3	Response lacks focus on the question. Response is generally fragmentary and lacks a clear structure and organisation. There may be many unsupported, brief or incomplete assertions and/or arguments with some inaccurate use of terminology.
0	0	No creditworthy response.

Level	Marks	Descriptors
5	17–20	Response is perceptive, logical and has strong evaluative elements. Evaluation is relevant and comprehensive. Strong evidence of synoptic thinking where knowledge from different topics is synthesised purposefully. Response fully addresses the demands of the question and features detailed and accurate knowledge reflecting depth of understanding of the subject content. The argument or discussion is coherent and well supported by relevant material. Use of terminology is accurate.
4	13–16	Response displays a sound evaluative element . There is some evidence of synoptic thinking through synthesising knowledge from different topics. Response is generally focussed on the demands of the question and features accurate knowledge, reflecting depth of understanding of the subject content. The argument or discussion is coherent and supported by relevant material. Use of terminology is accurate and appropriate.
3	9–12	Response is broadly evaluative rather than descriptive. Response addresses the question and features accurate knowledge, reflecting some understanding of the subject content. Argument or discussion is mainly coherent and supported by material which is largely relevant. Use of terminology is relevant and mostly accurate.
2	5–8	Response is largely descriptive. Response attempts to provide an argument to address the question. The weakest responses in this level may lack balance and/or depth. Response structure is broadly coherent but may lack clarity. Some lapses in use of terminology though generally accurate.
1	1–4	Response lacks focus on the question and may be largely irrelevant to it. Response is fragmentary and lacks clarity. There may also be unsupported assertions and/or arguments with limited or no use of relevant terminology.
0	0	No creditworthy response.

#### B H2 Generic Level Descriptors for 20m SEQ sub-part (b)