



**Cambridge International Examinations**  
Cambridge International General Certificate of Secondary Education

CANDIDATE  
NAME

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NUMBER

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**ENVIRONMENTAL MANAGEMENT**

**0680/41**

Alternative to Coursework

**October/November 2015**

**1 hour 30 minutes**

Candidates answer on the Question Paper.

No Additional Materials are required.

**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams or graphs.

Do not use staples, paper clips, glue or correction fluid.

**DO NOT WRITE IN ANY BARCODES.**

Answer **all** questions.

Electronic calculators may be used.

You may lose marks if you do not show your working or if you do not use appropriate units.

Study the appropriate source materials before you start to write your answers.

Credit will be given for appropriate selection and use of data in your answers and for relevant interpretation of these data. Suggestions for data sources are given in some questions.

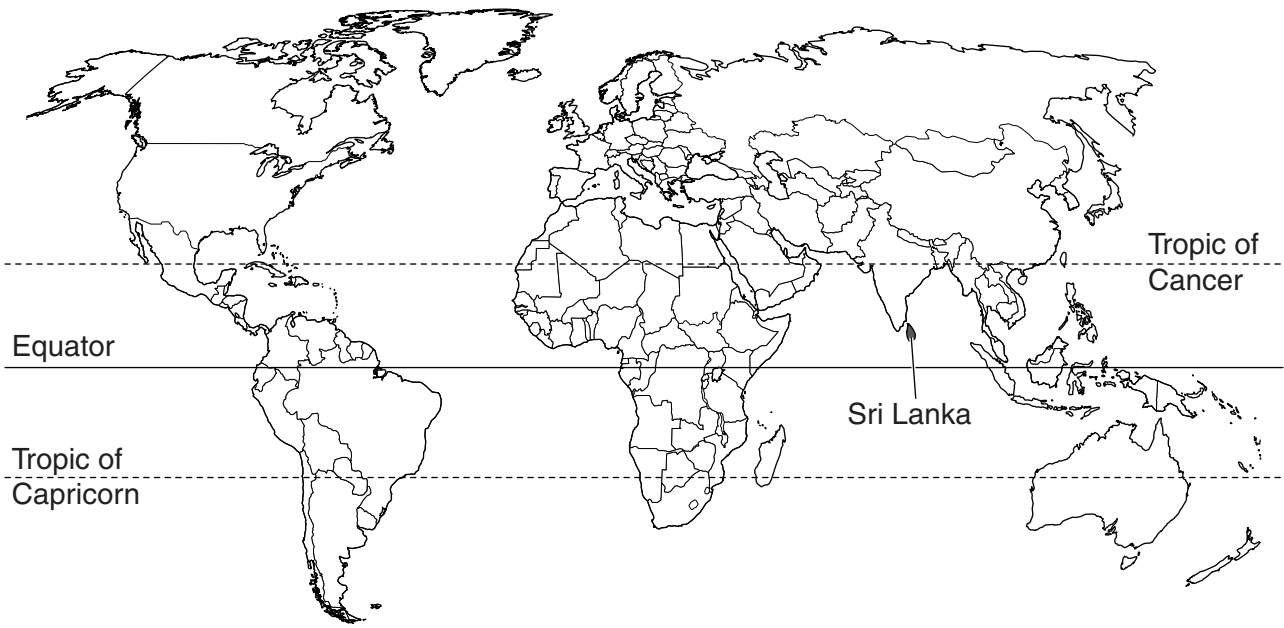
You may use the source data to draw diagrams and graphs or to do calculations to illustrate your answers.

At the end of the examination, fasten all your work securely together.

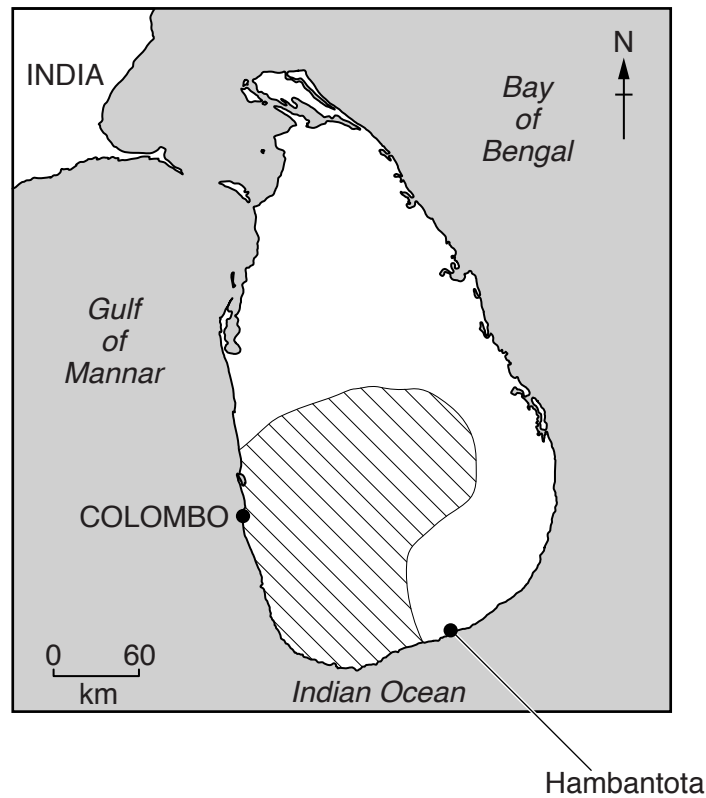
The number of marks is given in brackets [ ] at the end of each question or part question.

This document consists of **14** printed pages and **2** blank pages.

map of the world



map of Sri Lanka



**Key**

- port extended
- //// wet zone > 2500 mm per year rainfall

**Area of Sri Lanka:** 65 600 sq km

**Population:** 22 million

**Children per woman:** 2.15

**Life expectancy:** 76 years

**Currency:** Rupee (130 LKR = 1 US\$)

**Languages:** Sinhala, Tamil

**Climate:** tropical

**Terrain:** low flat plains with mountains in the south central interior

**Main exports:** textiles, clothing, tea, spices, rubber, precious stones, coconut products and fish

- 1 Sri Lanka has developed manufacturing and service industries. However, more than 30 percent of the population are still involved in agricultural production. The south western area is the wet zone of the island. Different farming methods are used to grow crops and raise livestock in each zone. Demand for agricultural products continues to increase.

(a) Suggest why demand for agricultural products continues to increase.

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..... [2]

Look at the tables below, which show climate data for a farm in the wet zone and a farm in the drier zone.

wet zone farm

month	J	F	M	A	M	J	J	A	S	O	N	D
average rainfall/mm	89	69	147	231	371	224	135	116	170	398	365	167
average number of wet days	7	6	8	14	19	18	12	11	13	19	16	10
average temperature /°C	30	31	31	31	31	29	29	29	29	29	29	29

drier zone farm

month	J	F	M	A	M	J	J	A	S	O	N	D
average rainfall/mm	173	66	48	58	69	28	51	89	107	221	295	290
average number of wet days	10	4	4	5	5	2	3	6	6	13	17	18
average temperature /°C	27	28	29	32	33	33	33	33	33	31	29	27

(b) Using data from the tables, describe **three** differences between the climate of the wet and drier zone farm.

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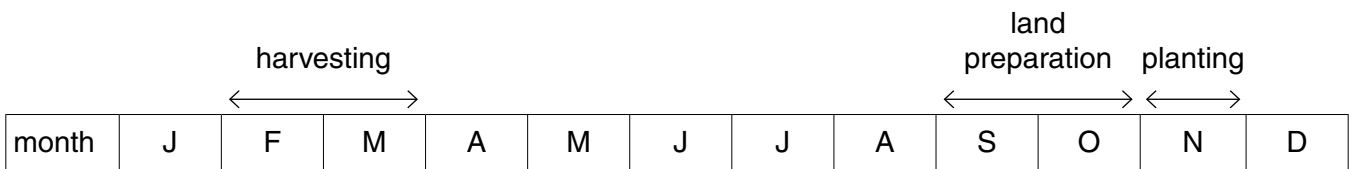
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(c) In the drier zone, most farms are small (less than two hectares). The farms are divided into separate plots of land. One plot is cleared for chena farming. This is a slash and burn method. It is used to guarantee a single crop of maize, cowpeas or millet every year. After three years the farmer stops planting crops and another piece of land is used for chena. The annual timeline for these activities is shown below.



(i) Using climate data from the table, explain why crops are planted in November on the drier zone farms.

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(ii) Explain how a slash and burn method, such as chena, prepares the land for planting.

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(iii) Suggest why there is little soil erosion on land used for chena between April and August.

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(iv) Explain why chena is a sustainable method of farming.

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- (d) Cows are kept on grazing land and given animal feed to produce milk. Some milk is used on the farm and the rest is sold in local markets. Recently, milk has been imported to meet increasing demand. A student used the internet to collect some information about milk imports into Sri Lanka.

year	volume of milk imported /million litres	value of milk imports /billion Rupees
2007	61.2	19.3
2008	65.3	30.8
2009	63.8	18.6
2010	75.5	29.0
2011	87.4	37.9

- (i) Calculate the percentage increase in volume of milk imported between 2007 and 2011.

Space for working.

.....% [2]

- (ii) The value of the imported milk nearly doubled between 2007 and 2011. Suggest **two** reasons for this large increase in value.

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- (iii) State which year does not fit the general pattern of increasing volume and value of imported milk. Suggest **two** possible reasons for this.

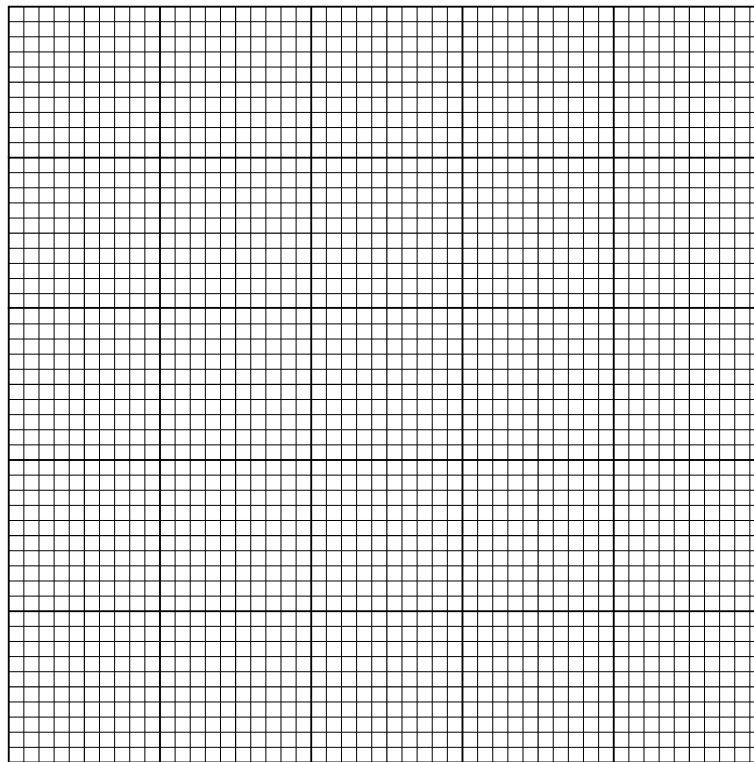
year .....

reasons .....  
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(e) Maize can be used for animal feed. Some maize has been imported in recent years to meet demand. The maize available in Sri Lanka is shown in the table below.

year	maize produced /million tonnes	maize imported /million tonnes
2007	56.4	78.7
2008	112.2	83.2
2009	129.7	28.0
2010	161.7	10.5
2011	128.5	8.2

(i) Plot the data as a graph on the grid below.



[4]

year

(ii) Describe the pattern for

maize produced .....

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maize imported .....

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(iii) Suggest reasons for the changes in the quantity of maize produced.

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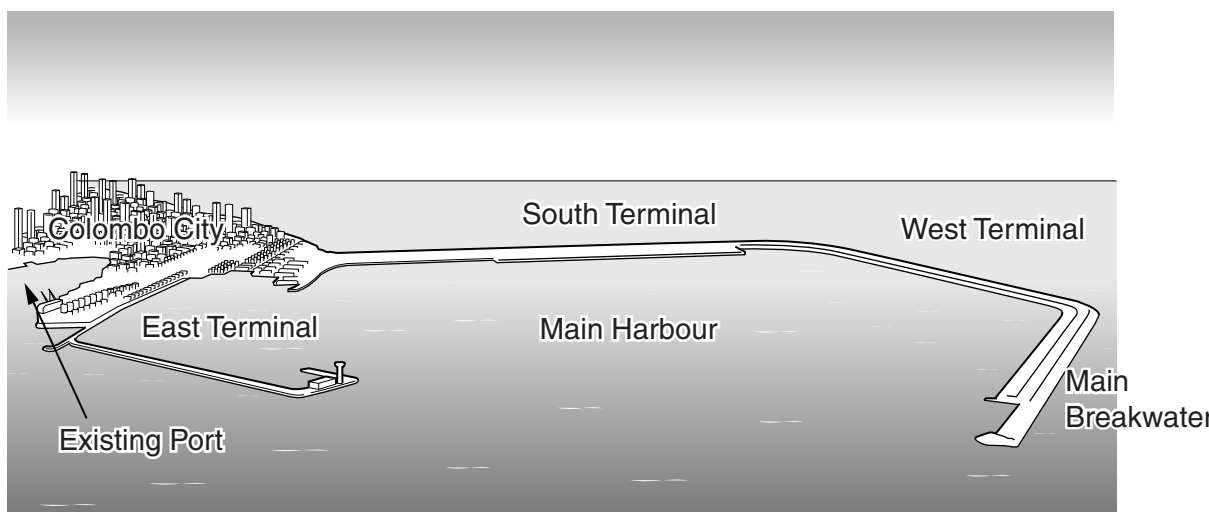
(f) The government aim is for Sri Lanka to be self-sufficient in milk by 2016. The number of cows and milk production have already increased. However, the government are continuing to support farmers by:

- giving long-term loans for buying cows
- increasing veterinary visits to farms
- importing some different breeds of cows

Explain how each measure will help Sri Lanka to become self-sufficient in milk production by 2016.

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- 2 (a) The world's busiest shipping lane passes close to the southern tip of Sri Lanka. The government has extended the deep water port at Colombo.



A newspaper report stated:

“Before 2013 Colombo port could handle 5 million containers a year. The extended port opened for shipping in 2013. The extended port can now handle an additional 7.5 million containers. A new breakwater 5.2 km long and 7.2 m high has been built. There are 5 more port extension projects under construction. These projects are expected to create 25 000 new jobs and up to 200 000 related jobs. A new city is being built beside Colombo port by reclaiming 230 hectares of land from the sea. All these developments should be completed by 2017.”

- (i) Calculate the total number of containers that the old and extended port could handle in 2015.

Space for working.

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- (ii) Suggest what is meant by the term “related jobs” **and** give **two** examples of related jobs.

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(iii) The maximum tidal range is 1.0m at Colombo port. Suggest why the breakwater was built 7.2m above mean sea level.

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(b) A port engineer said, "The breakwater was constructed using 5 600 000m<sup>3</sup> of rocks transported from inland quarries and 15 500 000m<sup>3</sup> of sand. The port had to be 18m deep. This meant sand had to be removed from the sea bed. This sand was used to build the breakwater."

(i) Describe the possible environmental impacts of removing rocks from inland quarries and transporting them to the port.

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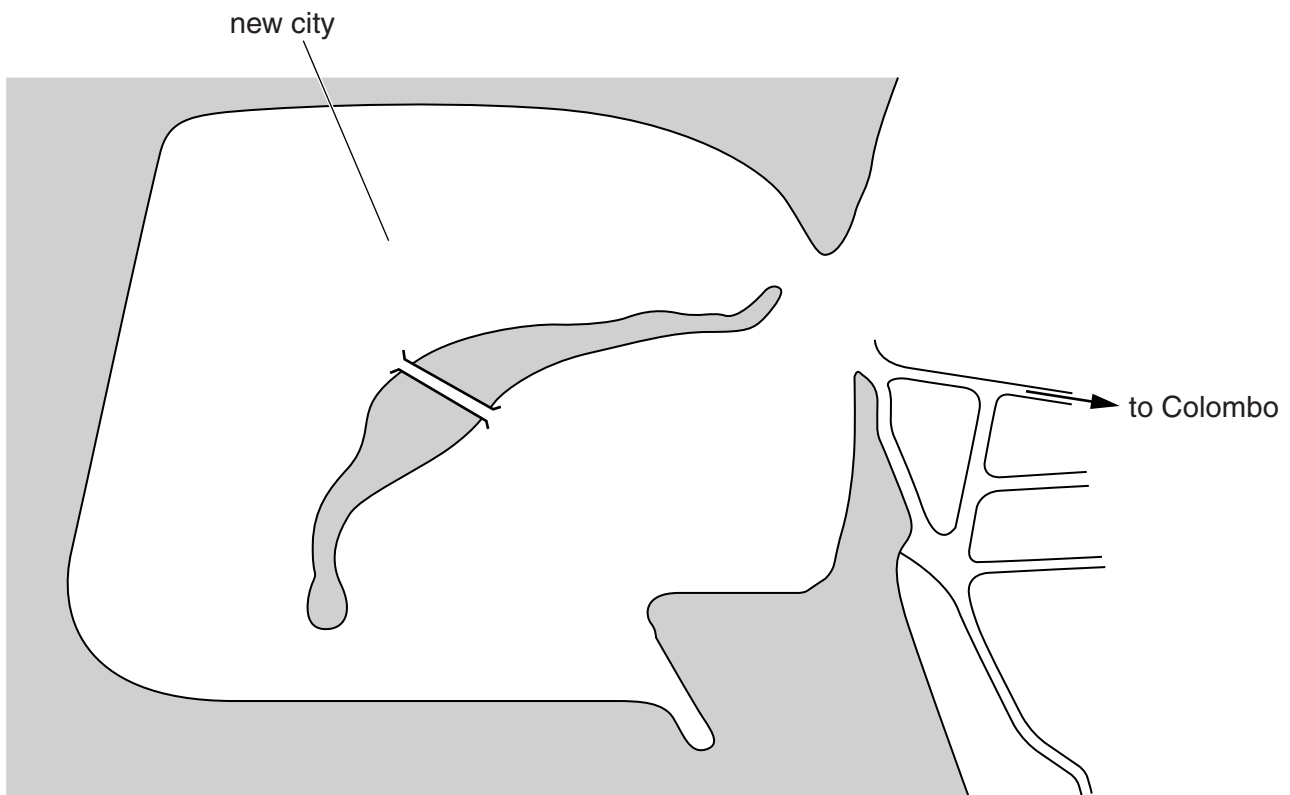
(ii) Suggest the advantages of using sand from the sea bed in the building of the breakwater.

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
(c) To build the new city, more rocks are needed as well as more sand from the port. The proposed new city must have:

- buildings
- services
- a road system
- two green spaces with trees
- a marina for small boats
- three schools

(i) You have been asked to present a plan for the new city. Draw your plan on the outline map below. Include a key of your planned features. [4]



**Key**

:  roads

(ii) Explain how this new city can be built and serviced to reduce all types of pollution.

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(d) Hambantota is another port only 12km from the world’s busiest shipping lane. It is being developed to supply fuel and fresh food to passing ships. A long-term bank loan from another country has been used to pay for this development. Recently, the interest on the loan has increased from 1.3 to 6.3 percent per year. This development was expected to provide new jobs for local people. However, by 2015 no new jobs had been created.

Suggest why this port development is **not** benefitting Sri Lanka as expected.

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(e) To survey local people’s views about development projects, interviews can be carried out using a questionnaire. A researcher asks each person each question and records their answers. The completed questionnaires must be a representative sample of local people with different interests in the development project.

(i) State **one** advantage of the researcher completing the questionnaire for local people.

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..... [1]

(ii) Suggest how the researcher could make sure a representative sample of local people with different interests is selected.

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(iii) Suggest how the results of the questionnaires could be summarised.

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(iv) To develop Hambantota port, about 70 families living in a large cashew nut plantation had to be relocated.

One family member said, "Each family owned a small plot of land. Eventually, each family was paid 600 000 Rupees to move away. Each family had reservoirs and brick making huts, but we were never paid for these. The cashew nut crop gave us a good income. Now we have nothing."

Suggest **three** questions, in the space below, that could have been used to obtain the information given by the family member.

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2. ....  
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[3]



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