UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2009 question paper

for the guidance of teachers

5014 ENVIRONMENTAL MANAGEMENT

5014/02 Paper 2, maximum raw mark 60

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

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1 **(a)** protein/oils/energy/calcium/vitamin D/prevents kwashiorkor/rickets;
[A vitamins and minerals R nutrition]

(b) *to villagers:* more income; employment; more food; raise standard of living; can afford schools/medical treatment;
to government: more foreign exchange; economic advantage e.g. exports/BOP;more taxes; more money for infrastructure e.g. hospitals; villagers need less/no aid; [max 2]

(c) **(i)** drawing sealed ponds inside lagoon; six ponds; one labelled nursery pond; [3]

(ii) 200 000 ÷ 80; = 2500 (Kg); ignore other units [2]

(iii) 1 coconuts located at C/nearest the land;
2 dig up coconuts – why to get pH between 7–8/see if pH changes;
3 take more samples – why to check the results/see if pH changes over time;
4 not building ponds – why not in acid parts/below pH 7/C/build in other areas/ABDE; [3]

(d) **(i)** lose coastal protection against storms/flooding so damage the village/their boats/the fishponds; spawning grounds are lost so no more breeding stock; reduced fishing catches so less food/health/income/jobs; too many ponds means too much labour directed at ponds/cost of labour/not enough labour for other tasks/e.g. of tasks; leads to poverty;
AVP; further details of the above [max 5]

(ii) find out how to breed to produce eggs in ponds/eq; set up special breeding ponds; how to keep fry alive/encourage growth; better method of catching fry/how often can they be caught/discover their breeding pattern/location of breeding; [2]

2 **(a)** **(i)** to prevent impurities/dirt/solid debris; first flush is acidic/prevent chemical pollution e.g. pesticides;
[R fertilisers] [2]

(ii) mosquitoes would lay their eggs; larvae hatch and increase mosquito population; so more diseases spread; [1]

(iii) stop more solids/debris/dirt entering; stop other animals entering; maintain water quality; [2]

(iv) lots of work/cost of digging the hole; increased risk of contamination/flooding; or leakage/breakage; more maintenance if underground; need to pump water out/eq; [2]

(b) **(i)** to find the average/make data more reliable/accurate/precise/valid; [1]

(ii) appropriate scaling; axes labelled with key as needed;; plots correct (allow 25% error); [4]

(iii) C – collector damaged/leakage; in a sheltered or windy spot;
[A ref to interception R evaporation unqualified] [2]

(iv) 19 + 17 + 14 + 18 = 68 ÷ 4 = 17; x 40 = 680 litres/eq; [2]
[correct answer only ;;]

(v) to find out the rainfall in mm; improved accuracy (A ref to control); compar data/eq; so they could work out how much water the house could collect;

(vi) Either June and July; as little rainfall/lowest no of rainfall days;
need to maintain supply/less/no water available from other sources;

Or Feb–September; as low no of rainfall days; need to maintain supply/less/no water available from other sources;
[A Feb–July R other months ignore one month added to June–July] [3]

(c) (i) steep gradient/big drop in ht/speed/eq;
[R volume and ignore waterfalls] [1]

(ii) they do not release any carbon dioxide/greenhouse gases/less fossil fuels used/renewable; [1]

(d) (i) soil erosion upstream; dam reduces flow rate/water velocity; suspended particles settle out/silt collects; [max 2]

(ii) 6–7 years; [1]

(iii) no more income from electricity; Government/taxpayers still paying for the project after its useful life; so cannot invest in new developments/would have to borrow again to fund next development; [max 2]

(e) (i) *Advantages:* raise standard of living; if near town easier to get jobs; services; less disease from new house; especially in rainy seasons;

(ii) *Disadvantages:* not able to farm; no fodder for cows; expense/time to travel into town; not easy to find a job/ low paid job/need training; less healthy vegetables to eat; loss of contact with family/way of life;

[A towns once any 4 four points] [4]

3 (a) (i) 31 500 ÷ 45 000 x 100 = 70.0%;; [2]

(ii) (root nodules) fix nitrogen/eq; so trees and other crops grow with less/no fertiliser; less money on fertiliser; fodder for animals; reduces soil exhaustion/maintains fertility/adds nutrients to soil;
[R food for humans] [2]

(iii) shelter for other crops/animals; coconuts only a small part of farm income/eq; needed to tie up their cattle; coconut residues feed cattle which earn most money; the treatment can be done/afforded; long time to grow new trees; [max 2]

(b) award one mark for each of the ideas
1. rotation idea;
2. fallow plot;
3. intercropping/described;
4. tea as a cash crop;
5. ref to animal manure;
6. no/less need for fertilisers;
7. maintains soil fertility;
8. balanced farming of plants and at least one animal;
9. income from another sold product (other than tea); [max 5]