

SUSTAINABLE GEOGRAPHY

A case study on renewable crops with examples of student work

FOUR DIFFERENT RENEWABLE CROPS IN FOUR DIFFERENT COUNTRIES

This case study showcases student work on renewables, part of a new project based on existing links between Glebe School and Bangladesh, Uganda and the Windward Islands. It provides material for other secondary school students which may be useful directly to them or give them ideas about how they may develop their own projects. Glebe is a secondary special school in West Wickham, Kent and students at the school have statements of moderate learning difficulties. This work will form part of their coursework for GCSE in the pilot geography exam run by OCR.

Throughout the case study we've taken the view that a geographer's role is to be a critical analyst of the impacts of renewable non-food crops on people and places where they are grown. The underlying ethos of our geography work is sustainability and I have tried to support students towards developing a sustainability ethic. I'm keen to deal with the argument that non-food crops could lead to a food crisis and think that these and future projects will have more impact if they are able to address these questions critically at an appropriate level for students to understand. The projects also show that non-food crops have always had a place in our societies and can find new places, offering the potential to address sustainability issues rather than making them worse.

The aims of the geography department at Glebe School are:

- To encourage each student to develop and enjoy their geographical learning
- To encourage each student to overcome barriers to learning such as literacy skills by enabling multiple learning approaches
- To encourage each student to direct their own learning in collaboration with others
- To critically use 'real world' learning wherever possible as an integral part of the curriculum
- To make connections with learning in other subjects.

Special features of our geography department are:

- Students use the collaborative learning cycle (a participatory action research cycle) to structure their geographical enquiries
- Students help run the Bromley Garden Project – including Bourne Vale Allotment and a termly Farmers' Market in Bromley. This project resulted from a DfES Enterprise Pathfinder Award
- Students take part in a range of school grounds development action research projects
- Students learn about more distant places through outdoor experiences based in Snowdonia, Shoreham, Bude, Isle of Wight and, more recently, through links with communities in Uganda, Bangladesh and St Vincent
- Glebe School was chosen to be part of the new pilot GCSE in geography run by OCR
- We are involved in curriculum development projects such as OCR Geography Pilot including involvement in research project with Birmingham University, Ofsted ESD Project, global dimension project with various parties, RGS KS3 Action Plan, RGS Inclusive Fieldwork, WWF Sustainability project, GA Geo-citizen project.

One of the latest developments in the department is the creation of a new website called sustainable geography www.sustainablegeography.co.uk

SUMMARY OF STUDENT PROJECTS

1. AN OVERVIEW OF RENEWABLE CROPS

An overview to set the case study in context and link it to work already taking place in the school.

2. BANGLADESH – BAMBOO

A study of the many uses for bamboo in Bangladesh. The students interviewed Miss Rahman, a teaching assistant who grew up in Kauchur Khandi, a village in Bangladesh near Sylhet. Her family grows bamboo and sells it in the local community. Bamboo is seen as the ultimate, long-established, multi-use, non-food crop. It is used for stools, mats, baskets, traps and decoration; for building houses, making ladders and scaffolds and in both Hindu and Muslim funerals, for burning or burying the dead. The project has developed into a practical one with a sun shelter made partly from bamboo being built in the school.

3. WINDWARD ISLANDS – BI-PRODUCTS OF BANANAS

There has been significant comment recently in the press about the multi-use of crops, especially food crops, to meet concerns about land use by non-food crops. This project looked at the potential for bananas to be used as such a multi-use plant - grown as a food crop (primarily for export) but with potential to be used as a non-food crop locally. The students researched the potential uses of secondary products from the banana plant by interviewing their geography teacher about his trip to the Windward Islands and his links with Windward bananas. They also interviewed staff from Waitrose in Beckenham and a researcher in geography, and researched the topic on the internet. They are also developing a practical response culminating in an eco-fashion show.

4. UGANDA – SUGAR CANE AS A BIO-FUEL

A critical look at the use of sugar cane as a bio-fuel and the importance of location. It considers the case of a planned sugar cane plantation in a nature reserve that was rejected by the Ugandan government who chose instead to maintain the forest in its natural state. Uganda has a research project to develop a strain of cassava for use as both fuel and food. A non-food crop called moringa, grown extensively for its nutritional and medicinal qualities, is also the subject of much interest due its potential use as a bio-fuel. This crop is able to grow in some very poor quality soil and is well known by our partners in Muteesa II Primary School and yet is largely unknown here in Britain. The school hopes to discover more about renewable crops in Uganda after a visit to the school from a representative from the Ugandan Workers Party.

5. UK – HEMP

This project is presented as a news report that looks at the multiple uses of hemp. The school is looking at options for developing a practical approach to this work by using hempcrete (a hemp strengthened building material) in the school grounds and by using hemp bags for our paper recycling.

RENEWABLE CROPS: IF ONLY WE COULD GROW OIL BY SÅM

IDEAS FROM
STUDENTS

You may have heard people talking about petrol, food and energy prices rising. These price rises are mainly because the price of oil itself is rising. Why is it rising? The people of the world use oil for many things now including most transport, plastics and energy. But there is only so much oil on the earth and it takes millions of years to make. When we use it up it will be gone. Even though we know this we still keep using more so that we can drive cars, use computers, get food from all over the world, keep our homes warm and protect the things we buy in strong see-through plastic. Earth Scientists or Geologists are hunting for more oil everyday in places they have never looked. People say that wars will be fought over oil and some say that the war in Iraq was all about oil. This is because people are worried that there won't be enough oil to keep us living the way we are now. Even if we get enough oil we might still have real problems. Most climate scientists think that global warming comes mainly from pollution from burning oil. When oil is burned (like in cars and power stations) it makes a gas called carbon dioxide. This carbon dioxide is called a greenhouse gas and it is trapping heat in the earth's atmosphere which is warming the earth up. For more information on some work we are doing on climate change click on these links:

<http://sustainablegeography.co.uk/climatechange.aspx>

<http://sustainablegeography.co.uk/theclimateproject.aspx>

<http://sustainablegeography.co.uk/carbondetectives.aspx>

Many people are saying that we should change our lives now before it is too late. We should use less oil and find other ways of producing energy and materials. For example, some people think nuclear power is a good way to make energy that doesn't need oil and doesn't produce greenhouse gases but other people say it's very dangerous and takes ages to become safe.

Most people think that if we can find ways of making energy from the sun and the wind and water it would be good but so far we can't make enough of it to do all the things we do with oil. If we just travelled less, bought food from local farms and didn't use as many electrical things we wouldn't need as much fuel anyway. For example, I'm doing a project on sustainable transport at the moment where our school is trying to find ways to use less petrol – click on:

<http://sustainablegeography.co.uk/travelandtraffic.aspx>

But there might be another answer and it is called Renewables. Renewables is a name that is used for plants that are grown to be used by people not for food but for other things. People have always done this. Like when we use wood to heat our houses and cook food, or straw for animals to lie on. Because of the oil crisis (not enough, too expensive and polluting) people are looking more closely at plants to see if they can help even more. But not everyone likes them. For example, many people are worried that we will stop growing enough food for people just so that we can create bio-fuels for our cars. To help us understand renewables more and make our own minds up we decided to do a project on renewable crops. We are going to study four renewable crops from around the world. Three of them come from the countries our school links with: Bangladesh, Uganda and the Windward Islands and one comes from Britain. For more information of our links with these countries click on:

<http://sustainablegeography.co.uk/greendoors.aspx>

The Renewables we will study are:

- The many uses of bamboo in Bangladesh
- Thinking about sugar cane as a bio-fuel in Uganda
- Using the whole of the banana plant in the Windwards
- Hemp in Britain – if it is so good why can't we all grow it?

We want to show that just like oil, renewables have many benefits but some may have problems too. But we think that some renewables could be a very good idea provided that local people still get enough food to eat.

**BAMBOO IN BANGLADESH:
AN INTERVIEW WITH MISS RAHMAN BY REBECCA**

I interviewed Miss Rahman about bamboo in Bangladesh because she is an expert about it. She used to live in a village that our school links with called Kauchur Khandi. Her family grows bamboo and sells it to people in the village and she went to see them last year and took lots of photos. Here are my questions and Miss Rahman's answers:

1. Can you get them anywhere else other than Bangladesh?

Bamboo grows in hot tropical regions; it grows in countries such as Australia, India, Africa and South America.

2. What do you use bamboo for in Bangladesh?

Bamboo is widely used in Bangladesh for almost everything. It is used in construction, bridges, fences, furniture and household items such as baskets, vases, fans amongst many other useful items. The boats in the photo have roofs made from bamboo and the bridge behind is also made from bamboo.



3. What colour are they?

Bamboo is a member of the grass family so it is green in colour.

4. What climates do they grow in?

Bamboo grows in hot tropical climates.

5. How tall can they get?

They are the fastest growing woody plant in the world, they can grow very tall.

6 Is it safe to walk on the bamboo bridge?

Bamboo bridges are usually found in the villages. People who use them everyday are not afraid to cross them, but if you were to cross the bridge for the first time I'm sure it is terrifying and there is always the possibility of falling off and into the water below.

7 Does it get hot in houses made of bamboo?

Many houses in the village are still made of mud. Bamboo is used to build the walls inside the house. It is very hot during the summer days and the houses are cool in the winter. The bamboo is weaved together to make screens which are placed on the front of the house so that the sun is blocked out which makes it cooler inside.

8 If there is bad weather can bamboo get damaged?

Bamboo is very durable and can withstand bad weather. The biggest problem with bamboo is that over time it can get infested with insects unless it is treated.

9 How important is bamboo to everyday life?

Bamboo is used in almost every aspect of life in Bangladesh. It is very important, people use it for everyday tasks such as cooking, shopping, fishing, sleeping on etc.

10 How can we use bamboo to change our environment?

If we were to grow bamboo here in the UK I am sure it would help us to change our environment. We could use bamboo to replace plastic bags, trays, containers etc

BANANAS – IT'S NOT JUST FOOD YOU KNOW: A REPORT BY LEANNE AND PERRY

It may surprise you to learn that the banana plant can be used for more than just food. By doing some research we found out that you can use:

- **banana leaves** for cooking food in and wrapping things, including food in. You can also use it as a mat – when the bananas are taken down from the tree they can be put on top of a blanket of banana leaves to stop them going rotten while other bananas are picked
- **banana skins** can be dried to make art, they can be mixed with re-used paper to make new paper, they can be used to make compost
- **the banana tree** can be used to make paper and people are getting much better at this
- **bark** can be used as art or as an alternative to paper or card especially in art projects

Why is this a good thing?

Well, once the banana tree has grown all its fruit it is dug up and the leaves and tree trunk are thrown away. A new plant is grown and it grows very quickly too. If the whole plant can be used by the banana grower then it will be a much better crop for them. After doing research we think that probably the best ways to use the other parts of the tree are by selling the leaves for cooking and for making paper from the fibres in the banana plant.

To help people in the Windward Islands we are investigating ways that we could use bananas in England. We are doing a project which we will give to Helen from Windward bananas and Sharon and Nick from Waitrose in Beckenham when they visit us in the summer.

We want to show people that bananas are more than just a food but that they are an important food too. By getting all of these things from one plant means that the land is used well and it should give the growers more money and be kind to the environment too.

Eco-fashion and Bananas

We have decided to do this by using non-food parts of the banana plant in a fashion show we are holding at school this summer. Our show will have an eco-fashion theme and we will use:-

- dried bananas to decorate our clothes (the bananas will be sprayed silver)
- flyers made from a mixture of re-used paper and banana skins
- plates and hats made from banana leaves

We got our ideas from interviewing Mr Crabbe about his trip to the Windward Islands. Click on for more information on the Windward Islands and our link with Waitrose:-

<http://bromleygardenproject.co.uk/windwards.aspx>

We also looked at a lot of other websites. We really liked these ones:-

http://www.ecopapers.com/index.php?main_page=page_2

http://www.papyrusaustralia.com.au/asp/why_banana_overview.aspx

We are working with the Humanities Education Centre from Tower Hamlets now as Fair-trade Ambassadors and we will make sure all our ideas are good for the people who grow the bananas.

Photos of our work so far

We have been keeping photos of the work we have done so far and we will put more on the Windward Islands pages (<http://bromleygardenproject.co.uk/windwards.aspx>) when we get them.

So far you can see photos of:

- Banana Plants with labels to ways they can be used
- How to make paper
- How to use dried banana skins for art

**NOW YOU CAN GROW FUEL FOR YOUR CAR.
IS THIS AS GOOD AS IT SOUNDS?
BY JACK**

Bio-fuel might sound like a good idea but not everyone likes it. Oil is becoming more expensive every day. It is harder and harder to find. It is putting more carbon into the atmosphere which is leading to global warming. Bio-fuel sounds like the perfect answer. It is renewable. It doesn't pollute the environment as much and we can grow as much as we need. Or can we? If we grow too much we'll have no land left for food and we'll die much quicker than from global warming or because we can't heat our houses. I know it sounds dramatic but bio-fuel is not a miracle but something we need to be careful about too. I am going to try to explain what I mean by talking about a plan last year to develop a massive sugar cane plantation in Uganda.

Mabira Forest, Uganda

Last year, 2007, in Uganda near Lake Victoria a massive bio-fuel project was turned down by the Ugandan Government. The idea was to chop down 17,500 acres of a national forest reserve called Mabira Forest and plant sugar cane not for food but for bio-fuel. This is nearly a third of a forest that is supposed to be protected because it is one of the last old forests in Uganda with over 300 types of birds, 200 different types of trees and nine types of primates (gorillas and monkeys).

I googled 'Uganda sugar cane bio fuel' to find out about this and there were loads of sites and most of them were happy that the decision was turned down. The Guardian also said that it may have caused racial tension because rich Asians owned the company called Mehta that wanted to buy the land and the poorer black people didn't want the forest to be chopped down. Environmentalists were pleased not just because of the animals and plants that were saved but they said that the ability to store carbon in the forest was much better than cutting it down to create an oil free plant. They also said that there might be a risk of flooding and drought in cycles if the forest was cut down. Some people were disappointed because there would have been a lot of jobs created by the sugar cane plantation.

The Ugandan Government isn't against sugar cane production for bio-fuel but it wants it to be in areas that are good for the people and the environment too. Some people, like Care International, are also worried that bio-fuels might be a bad thing for poor people who may not be able to get food because land is used to grow fuel.

During my googling I came across another project that may be good. Instead of using sugar cane the Ugandan Government is thinking about making fuel from a plant called cassava. Cassava is a plant that provides food for many people and is used a lot in Uganda but recently disease has killed a lot of the plants. This new plan would try to make a new cassava plant that gives more food and can be used for bio-fuel. If they can succeed in doing this I think it is a very good idea provided they don't chop down any forests to do it.



Paradise Fly Catcher www.credit-uganda.com/mabira.htm



Mabira Forest www.pearlof africa.nl/Forrest1.jpg

**THE BRITISH GOVERNMENT GROWS CLASS B DRUGS
FOR MONEY!
A REPORT BY MICHAEL DUNNETT**

Well it's not quite true but the British Government (and many Governments around the world) allows a type of cannabis to be grown because they think it's very good for us. Not the cannabis you smoke but a member of the same family and most people call it hemp. When it is grown for money by the government they sometimes call it industrial hemp. It has only a little bit of the drug (THC) in it that people who smoke cannabis like but it has loads of other uses.

I wanted to find an industrial hemp farm in England that I could visit but I couldn't and we're not allowed to grow it in our school because you need a special licence so I am going to give you a list of things instead that you can do with hemp. And I think you'll agree that it is amazing and wonder why we don't use it more.

The Hemp List

- Making rope
- Mixing with other fibres to make material
- Textiles
- Paper
- Animal Bedding
- Moisturiser
- Helps make oil based paints
- Make cement stronger – hempcrete
- Inside panels of cars like Mercedes – bio-composite
- Milk substitute
- Leaves can be eaten in salads (contains omega oils, amino acids, minerals)
- Hempflour
- Bio-fuel
- Medicine

And there's a lot more. One website I looked at said that hemp had over 4000 uses!

In my view hemp is brilliant. It's good for the environment, easy to grow and really useful. I know people are worried that it might be used as a drug but from my research I have found that industrial hemp makes a rubbish drug but is brilliant for everything else. I hope the British Government grows more hemp and it begins to replace things that are bad for the environment like non-organic cotton, oil and plastic, and paper that's not been recycled.

