Before building anything, sit down and think about these things:

1. What materials do you have?
Identify materials you can digest:

a) Animal wastes, cowdung, pig manure, chicken manure, camel, horse etc.
There needs to be a supply of animal wastes to provide nitrogen and phosphorus. Such sources would be: cow dung, for example from cattle kept overnight in a boma (kraal). Other sources are pig manure, chicken manure from chickens kept in cages or other intensive rearing unit. Horses, goats and camels also provide manure.

b) Vegetation waste. These include: banana trunks after the fruit has been harvested, maize stalks, coffee wastes, water hyacinth, grass cuttings and so on. In areas where grass is burned during the dry season it may be suitable to use this grass in a biogas plant instead

c) Human waste. I can't give advice on this as I have never used it and there are health and safety conditions that I don't know the details of. Look for WHO advice. The basic condition is that human waste needs to be out of contact with humans and the air for at least 30 days (check the number of days with WHO, as it may be 60 days). The oildrum digester is NOT suitable as the mixture is in contact with the air, and the operating procedure allows material that is not fully digested to come out through the bottom valve. This means there is a danger of spreading disease.

However, clearly human waste is a suitable raw material and if done properly the process can solve some problems of what to do with it, and also to get it safely on to the soil to grow crops with. But the apparatus will cost more.

In each case try to estimate the daily weight you will have. A rule of thumb is: one tonne will produce at a rate of 1 cubic metre of gas a day at 37oC for four weeks.

2. What is the normal temperature
The process is simplest in places where the ambient temperature is about 35oC. The cooler it is the slower the process. In places where there is a Winter, the process may not work at all unless the mixture is heated. Usually heat will be provided by using some of the gas output to heat the digester. L. John Fry (in the South African High Veldt) heated his digester with the cooling water from the engine that was generating electricity. Solar water heating might also be a source of heat.

Tropical low ground is very suitable for biogas, as the daily temperature range is within the optimum range. Biogas is very successful in the centre of Nigeria, although higher parts of Kenya are less suitable as night time temperatures fall below the range that the bacteria prefer. (Biogas has been tried in the Kakamega district where night time temperatures cause the process to slow down at night).

3. What are you going to use the gas for?
Identify the uses you will make of the gas, and the demand of each usage. Make sure you are not trying to use more than you can produce and also that you are not wasting any (Gas which escapes makes a contribution to global warming by putting more methane into the atmosphere).

There is no point in making biogas before you know what people are going to use it for, and who is going to use it.

A small biogas plant can supply a family for cooking. A larger one can provide energy for such uses as small scale industries or crafts. An industrial sized plant can supply gas for making electricity, or even running a train (see an example in Sweden).

4. How are you going to use the solid and liquid outputs?
Identify uses for the liquid and solid output of the apparatus. As soil improver these may well be the most valuable. Consider the advantage of having an organic agriculture project - better prices are an advantage if you are selling produce.

The solid and liquid products of a biogas plant are at least as valuable as the gas itself, and may even be considered as being more valuable. A biogas plant can be thought of as a device which bribes people with gas into making the valuable compost.

The fertilising outputs can be used to improve crops. If supplied to an enterprise growing for sale they could lead to classification as Organic Producer. Coffee is a good example of this, as Organic Coffee sells for a higher price than ordinary coffee.

Before setting up a large gas plant the uses for the output should be identified. It may be appropriate to get contracts for the use of the products.

In monetary terms the sale of the fertiliser would be essential for the overall profitability of the process. Even if they are used in a cooperative or family without money changing hands the value of these products should be emphasised.

5. Water
Don't forget you will need a supply of water. This does not need to be of drinking quality but should not have detergents in it.

6. Professional suppliers
These days there may be professional suppliers of apparatus. If there are these may be better than trying to design your own. In many countries there is no source of professional units, so then you will have make do with what you have.

Look for local suppliers of biogas units, see the Biogas Kits page for some suggestions. Possibly the oil drum digester might be the easiest for you to start with as there may well be some oil drums around, but you will need to get some pipe, preferably plastic. As it is not heavy it should not cost a lot if it has to be transported.

7. Carbon credits
These energy sources should also receive Carbon Credits from the Carbon Exchange market. For this purpose there should be an Association of Carbon free Energy producers, open to the smallest producers. Even if the system is not operating yet, there should be one in the near future.