

Module 05 :



cewas



Week 01:  
Project revenues  
and costs

Resource Recovery and Reuse  
(RRR) Entrepreneurship

# Week 1 module 5: Project revenues and costs

Hello and welcome to module 5 week 1: project revenues and costs.

As mentioned in the introductory video, financial planning is important to evaluate the financial viability of your RRR business. It will help you to take better decisions and convince financing partners to invest in your business. We will do a lot of excel tables together – so bear with me – it is crucial for your success!

In the last module you decided which resources you need to launch and operate your business. You calculated how much land you need, you chose your technology and you set up a staffing plan.

This week you are going to calculate the costs associated with acquiring these resources and the costs for running your business. So basically, what we will do is to create a detailed version of the cost structure from your business model.

You will also do a projection of your annual sales volume and revenues. This is nothing else than a detailed version of your revenue streams. By the end of this week you will have an estimate of the investment you will need to launch your business and of the profits or losses you can anticipate over the next 10 years.

So, Let's start with the investment costs. **Investment costs** usually occur at the beginning of the project and include things such as the purchase of the land, machinery, equipment, or construction costs.

You will find two worksheets below: one excel version and one pdf – choose what you want depending on whether you prefer calculating your investment costs on the computer or on paper. Let me show you how to calculate your investment costs in the tab “Investment cost”.

In column A you have the description of your investments. These are the physical resources you need before you can start your production.

The first part lists the **land and buildings** that you have determined in week 4 of module 4. Write down in the next column how many buildings and square meters of land you will need. Once you have done that, note down the cost of acquiring these in the third column. In excel, the total investment in the fourth column is calculated by itself.

Let me show you an example for a composting plant with a capacity of 12'000 tons of compost a year. They have calculated that they need 3 roofed treatment units for 70'000 each. In addition, they need an office as well as sanitary facilities for 50'000 each.

The second part lists all the **machinery and equipment** that you have determined in week 3 of module 4. List down all the machines and equipment you need. Not only for the pre-treatment, treatment and value addition but also for transport, storage and any support activities.

Just like above, determine how many machines and equipment you will need in column B, as well as the costs of them in column C. The total is again calculated automatically in column D.

If we use the example of the composting plant again, they need 2 waste collection trucks, 2 excavators, 2 shredders, 1 sieve and so on. Please do it the same way for your case.

When you start up a business, you have additional one-off expenses. We call them **start-up expenses**, because you only have to pay them once when you start up.

This may for example include paying an engineer to design and supervise the construction, get licenses, legal fees or creating a website. List these in the bottom part and calculate the totals.

If we look at our example again, the composting plant has to invest into engineering services, get an operating license, pay a lawyer to get the procurement contracts set up and finally the pay the state laboratory to get the necessary compost certificates.

Once you have listed all of the infrastructure, land, machinery and equipment as well as start-up expenses, you will get your total investment cost at the bottom. In the case of the composting plant, the total investment cost is 436'000.

Let's now look at your **revenues**. Revenues are the income that you make from selling your product or service. Technically it is a very simple calculation based on your selling price and the annual sales volume. You should already know your selling price from Module 3, and the annual sale volume from Module 2.

Let us look at the concrete figures now. Again, I will use the example of the composting plant to walk you through the calculation.

In your worksheet you will find another tab called "Profit & loss statement". At the top part of the table you will see the heading "Revenues".

As a first step you have to estimate your annual sales volume based on how many products you think you can sell or how much you think you can produce. In the case of the composting plant, it is expected that they will not operate at full capacity until year 8.

Why? On one hand, it will take time to get the product into retail shops. On the other hand, training new staff members operating the plant always takes up time that is consequently lost in producing

compost. And since staff fluctuation is very high in the local area, it will take the management several years until everything runs smoothly.

Instead of producing at full capacity in the first year, which would be 12'000 tons of compost, they only produce at 20%. That results in 2400 tons of compost only!

Let's go back to your own calculation. You should have calculated the capacity of your treatment plant in the last module. Insert this figure here for your product. Whatever it ma. Whatever it is: compost in tons, cubic meters of irrigation water, bags of briquettes. If you are selling more than 2 different products or services, add more lines to the excel table.

Once you have estimated your operating capacity and sales volume for the next 10 years, multiply that with your selling price to get your total revenues. In our example, the composting plant sells its compost for 55 per ton. Multiplied with the Tons of compost, the composting plant will have revenues of 132'000 in the first year of operation.

Moving on, we will look at costs now. We will start with **operating costs**. These are the **costs** for operating and maintaining your business. Remember, that operations are not just about the technical production process. There is much more to it and support activities like marketing & sales, human resources, financial management and other things might eat up a lot of cash!

Now if we go into details, we can divide operating costs in three parts: 1) the cost of raw material - if you have to pay for the waste, 2) of fixed costs and 3) variable costs.

The cost of raw material is the easiest. If you have done proper market research, you should have a fairly good idea on how much you will have to pay for it.

**More complicated are the Fixed costs. Fixed Costs** occur irrespective of the production volume. So, whether you are producing 100 briquettes a month or 1000, they always stay the same. Try to keep them as low as possible – they will cause the biggest headaches for you!

Typical examples are

- the salaries for your fixed staff - typically the ones carrying out support activities like human resources or financial management will remain the same
- So will the interest payments on loans,
- insurance,
- depreciation costs,
- renting of machinery or vehicles
- costs for promotional material etcetera.

**The last one out of the 3 operating costs are the variable costs. Variable costs** change with production volumes. The more you produce, the more variable costs you will have.

In RRR businesses, this are typically for example

- salaries of your temporary operational staff – you might have to hire temporary workers if your production volumes highly fluctuate during the year.
- the electricity, water, fuel and any additives needed for production
- maintenance of your machines and vehicles – so repair services and spare parts
- packaging of your product and delivery costs of your products
- any other consumable supplies like gloves and other protective gear.

Let's go back to the worksheet. In the same tab "Profit & loss statement" under costs you will find the description of your different costs on the left. Like I just explained these are split into the cost of raw material the fixed and variable cost. Let me explain the table by using the example of the composting plant again.

The **cost of raw material** refers to the price the plant has to pay its suppliers per ton of organic waste. 1 ton costs 20. The mass reduction of compost is 50%. So, to produce 12'000 tons of compost per year, the plant needs to process double the amount in organic waste – so 24'000 tons.

Since the plant is not operating at full capacity in the first few years, the costs for raw material is also not too high at the beginning. In the first year, the costs for the raw material is only 96'000. But you can see, as the plant increases its capacity in the following years to 50, 90 and eventually 100%, the cost of raw material proportionally increases as well.

Now, let's look at the **fixed costs**. As said before, fixed costs are independent of your operating capacity. So irrespective whether you produce something or not, you will have these costs. In our case of the composting plant, they employ 3 fixed staff members that earn 9600 each per year. That makes a total of 28.800 for the salaries alone. Adding to that, our composting plant needs to rent some equipment at a fixed annual rate, and they spent fixed amounts on promotion, office communication, insurances and trainings every year.

As the costs for raw material, the **variable costs** go up and down with the operating capacity. The more you produce, the more variable costs you will have. In our case, the composting plant employs 30 additional workers each earning 3'600 when they operate at full capacity. water and electricity to operate the machinery costs 5'000 when operating at fully capacity and maintenance costs 3'000. Fuel costs amount to 20'000 for two trucks and 2'000 is spent on consumable supplies, like protective gear and packaging material.

So far for revenues and operating costs. Now you can already calculate your **gross profit** (or loss) and your **operating profit** (or loss).

Your gross profit here in row 17 equals to the total revenues minus total cost of raw material. If your gross profit is actually a loss (so in the minus), then your selling price is definitely too low!

The operating profit you will find in row 37. It equals to the gross profit minus the total operating cost. If your operating profit is a loss, then you are either not operating efficiently enough or you don't sell enough of your products.

Now that you have calculated your operating profit, you might wonder why the investment costs haven't been deducted yet. This is because in the profit & loss statement, investment costs are not deducted, at least not directly. However, indirectly they are there through the position we call "depreciation."

When you invest into physical resources like buildings, machinery or equipment, they will need to be renovated or replaced at one point – so they have a limited lifetime. So, depreciation essentially is the money you put aside to finance that renovation or replacement at the end of the car's or building's lifetime. However, depreciation is only a calculatory value, because you are not really putting that money on the side. But we will look at that next week.

Depending on the resource this lifetime can be 30 years, 10 years, 3 years. You will need to check your national tax laws to be sure to assign the right lifetime to your resources.

To be able to calculate the total annual depreciation of your assets – which is just another word for physical resources – go back to the worksheet and the "Investment cost" tab. As you can see here, the last two columns are for noting the lifetime of each asset and calculating the depreciation of each asset. In its simplest form, depreciation is just the investment cost divided by the lifetime.

In the case of our example of the composting plant the lifetimes vary between the assets. For example, 20 years for the treatment units, 10 years for trucks and excavators, 5 years for the equipment like shredders and sieves and so on. The total depreciation that the composting plant has to deduct in its profit & loss statement every year is 33'000.

So, going back to the profit & loss statement, you can see that by deducting the depreciation, the composting plant is expected to make a loss, not only in the first year but for the next 10 years! After deducting the interest the plant pays on a bank loan, the **net loss** of the composting plant is even higher. Just from looking at the net loss, you might say that this business is not financially viable.

This is not something that is uncommon, especially for composting plants. They are very resources intensive, which drives up the operating costs, and when competing with the subsidized price of chemical fertilizers, they cannot sell their compost at a cost-covering price. The required investments into infrastructure are also quite high, so that only plants with very high operating capacities can break-even.

The Kerewalapitiya Compost Plant in Sri Lanka, that processes the organic waste of the capital Colombo, is such a plant. The plant treats 500 tons of organic waste per day (so 182'500 tons per year) and produces 50 tons of compost a day. Although they are only just breaking even with the current selling price, they are planning to increase their selling price by enriching the compost and make net profits.

But don't worry, you don't need to start straight away with treating the organic waste of a whole megacity. There are ways to get around this. We will look at possibilities for recovering operational costs with alternative revenue streams in week 3!

But before that, forecast the profit & loss statement for your own business and then head over to week 2 to learn about cash flow planning.”

## List of Reference:

### Graph sources:

- Unless otherwise noted, all graphics and case studies from OTOO, M. (Editor), DRECHSEL, P. (Editor) (2018): *Resource Recovery from Waste. Business Models for Energy, Nutrient and Water Reuse in Low- and Middle-Income Countries*. International Water Management Institute (IWMI). Routledge

### Image sources:

- Unless otherwise noted, all images from IWMI flickr library [www.flickr.com/photos/iwmi/](http://www.flickr.com/photos/iwmi/)
- Page 22: Pexels
- Page 24: Photo compost: Flickr: [National Rural Knowledge Exchange](#) - Compost from refuse