

Module 01:
Identifying RRR Business
Opportunities

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Week 02 :
Identify RRR
products and business
opportunities

Week 2 module 1: Identify RRR business opportunities

“Welcome to week 2 of module 1: identify RRR business opportunities.

Last week, you visualized the current water, nutrient and energy flows and related challenges in your local area. This week I am going to show you how can turn these challenges into business opportunities.

Let’s start by looking at what a business opportunity is. In the simplest terms, a business opportunity is a consumer need that has no solution yet – so a market gap that wants to be filled with a novel product or service such as nutrient rich organic fertilizer for healthier soils and higher and more sustainable yields. Of course, you can only fill this market gap if you can offer the demanded solution at a competitive price, so you need to get access to the raw material and find an efficient process for transforming this waste into a product for a price that people are willing to pay for. This is something we will look at throughout the whole course, by scanning your business environment, positioning your solution, and planning your operations and finances.

For now, you just want to make sure that there is a business opportunity in your local area that has a good fit with your know-how and interests. The aim of this week is for you to find your sweet spot! The sweet spot is the intersection of your passion (what you love doing), your profession (what you are good at), your vocation (what you will get paid for) and your mission (what your area needs). If your business idea corresponds only to what you love, what you’re good at and what your area needs, you will feel a sense of fullness but you will be poor. If your business idea is what you love, what the your area needs and what you will get paid for, you will feel excited but also uncertainty to the feasibility of your business idea. If your business idea corresponds to what your area needs, what you get paid for and what you are good at, you will be comfortable but will have a feeling of emptiness. And finally, if your business idea corresponds to what you love, what you are good at and you will get paid for it, you will feel satisfied but also useless.

So to make sure that you have identified a business idea that matches your sweet spot, you need to answer this first question:

1. Is this business idea something that your local area needs?

By coming up with a RRR business idea, you have implicitly answered this question already. RRR has enormous potential for closing water, nutrient and energy cycles and thus contributing to the Sustainable Development Goals (SDG): 6 (Ensure availability and sustainable management of water and sanitation for all), 11 (Make cities and human settlements inclusive, safe, resilient and sustainable), 12 (Ensure sustainable consumption and production patterns), 13 (Take urgent action to combat climate change and its impacts) and 15 (Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat

desertification, and halt and reverse land degradation and halt biodiversity loss) amongst others.

RRR businesses reduce pollution because waste is not discharged into the environment and they recover value from waste and thus substitute products that would otherwise need to be extracted with an environmental impact. As you can see in this chart – we call it the “Overview of waste-to-resources options” – almost any type of waste can be recycled: human excreta, detergents, organic residues, animal manure and used water can be recycled to retrieve either energy, nutrients, organic matter, water or other valuable materials. Different products like fertilizer, biogas or water for irrigation can be recovered from the waste streams, which allows flexibility and accounting for technology in regards to the product quality level or treatment standard desired. Although non-degradable waste like plastic, metal and glass can be recycled and bears huge potential; it is not covered in this course. We focus only on organic waste streams.

Let me give you some concrete RRR business examples to illustrate the various waste-to-resources options:

- In Kumasi, Ghana, a public-private partnership was established between the Kumasi Metropolitan Assembly (KMA) and the private company Waste Enterprisers Ltd. (WE) to use aquaculture as a source of revenue for sustaining the sanitation services. As part of the agreement, WE is allowed to stock catfish in the final maturation pond(s) of governmental owned wastewater treatment plants, while in return WE uses half of its fish-sale profit to facilitate regular plant maintenance.
- Kampala Jellitone Suppliers (KJS) is a limited company located in Kampala, Uganda, that produces fuel briquettes made from agricultural waste. Briquette production was initially started to meet internal energy needs only, but KJS soon recognized the potential and became the first large-scale producer of non-carbonized briquettes in Uganda. Its clients now include institutional and commercial users who previously used GHG-intensive wood fuel and charcoal for cooking and heating.
- Nakuru Waste Collectors and Recyclers Management Cooperative Society (NAWACOM), is a Kenyan waste processing cooperative that produces organic fertilizer from MSW. The cooperative’s activities are the production, marketing and sale of compost. NAWACOM sources its raw materials (partially processed compost) from its members (CBOs) and is their sole client.

So what value propositions do businesses like the ones we just saw have for your local area?

- Value proposition 1 Create new revenue streams and recover costs: Water, nutrients or energy can be recovered from wastewater, solid waste or faecal sludge. These new revenue streams can be used by utilities, municipalities or private service providers to recover costs of investment or O&M into waste management infrastructure. This in turn attracts private sector financing. Let me give you some numbers: the total costs for waste management in developing countries are expected to surpass USD 150 billion by 2025¹ and about USD 49

¹ (Le Courtois, 2012)

billion per year for additional capital investments for safe faecal waste management². At the same time the potential global revenues from the biomass value chain – so the production of agricultural inputs, trading of biomass and related processed products - are estimated at USD 295 billion by 2020³. The potential of utilities, municipalities or private service providers recovering costs with RRR is thus high and would have major impacts on the proper functioning and increased levels of waste management and water and sanitation services.

- Value proposition 2 Increase soil health and avoid depletion of natural resources: In the tropics soils are poor, nutrient depletion is high and commercial fertilizer is basically unaffordable. Minimizing resource loss and returning resources into the food production process is essential also in drier climates where every drop of water counts and organic matter is needed for sustaining soil fertility as natural biomass production is low. Again here are some figures: If 100% of consumption-related food waste and 50% of other food waste generated today were returned to the soil, it could replenish 5 million tons of nitrogen, phosphorus and potassium (N, P, K) reserves, substituting for 4% of current consumption. Or if all the nutrients from the current stocks of cattle, chicken, pig and sheep manure were captured, they would yield an astounding 345 million tons of N, P, K annually – more than twice the world's current consumption. If nutrients contained in the faecal waste of the world's population were captured, they would amount to 28% of the current N, P, K consumption. So, to summarize the key impacts of RRR businesses solving the natural resources challenge are: groundwater recharge, increased water reliability, decreased water use and soil amelioration.
- Value proposition 3 Overcome the urban waste challenge: The urban waste challenge includes environmental pollution from solid waste and faecal matter and causes public health and surface water quality issues. This challenge can be turned into immense and scalable opportunities for entrepreneurs through transforming waste from domestic and agro-industrial sources into low-carbon assets for use in agriculture and other sectors. So, some of the key impacts of RRR businesses solving the waste challenge are: increased surface water quality, public health, decreased eutrophication and offset of carbon emissions.

While looking into this aspect might sound all too altruistic to you, let me tell you that it is actually a very important business consideration defining the societal and environmental impacts of your business. Because, when I talk about what your local area needs, I actually mean governments, donor agencies, foundations, impact investors and other institutions potentially giving you funds to further their mission, which is promoting the wellbeing of people and planet in your area.

We will further look into convincing financial partners in module 6; for now you just need to define the value propositions your business idea holds for your local area by closing water, nutrient and energy cycles. For this, have a look at the locality map you drew last week and pinpoint which challenges you can tackle with your value propositions. Also record on your locality map how you can close these cycles and who you have to involve for doing so; for example for sourcing your waste supply.

Next question you need to look into for finding your sweet spot, is:

² (Hutton and Varughese, 2016)

³ (World Economic Forum)

2. Is this business idea something that you will get paid for?

While this might be an obvious question to some of you (as in: “my product is so great, everyone will love it”), it is a question worth asking especially when talking about RRR products. Your potential customers might currently be using a competing product that is free of charge like firewood or a competing solution like raw and free wastewater for irrigation. For example, in Ghana an area of up to 40,000 hectares is seasonally irrigated using water polluted with faecal matter, so insufficiently treated raw wastewater that the farmers can access free of charge⁴. In the next modules we will have a closer look at your potential market demand and how much your potential customers are willing to pay.

What you should think about now, is what your customers are willing to pay for; is it the actual fertilizer, biogas, or irrigation water or is it the added value they get from using it like increased yield, a smoke-free home and a reliable water source? Needless to say that they are not paying for the actual biogas but for the added value they get out of it instead of using firewood (as an example). Here is an overview of the added value that RRR products typically have for customers:

Typical waste-to-energy products are solid fuel (like briquettes), biogas, biofuel and electricity. While they are all alternative energy sources that are potentially cheaper than competing solutions, some of them also have the added value of being a more reliable (electricity for instance) or a healthier energy source (briquettes and biogas are smoke-free heating and cooking alternatives). Aspects that the customers might be willing to pay a higher price than for competing products.

Waste-to-nutrient products are organic soil conditioner and fertilizer as well as building materials like bricks. Their main added value that customers might be willing to pay a higher price for, is the increased harvest yield from healthier soils. Organic building material has the added benefit of being an energy efficient building material and ensuring healthier indoor climates from better temperature and moisture balance. Again, an aspect that the customer might be willing to pay a higher price than for conventional building material from concrete.

Waste-to-water products range from water for irrigation or industrial processes, over water for groundwater or surface water recharge to water for potable use. While water recovered from wastewater itself has the added value of being a new source of additional water – which is an increasingly important and unique value proposition in many arid regions of the world – it also holds other benefits for customers like more efficient crop management with nutrient-rich irrigation water or more efficient aquaculture, where protein-rich duckweed is produced in wastewater treatment ponds and fed to fish in adjacent ponds.

⁴ DRECHSEL, P. (editor), KERAITA, B. (editor) (2014): Irrigated Urban Vegetable Production in Ghana. Characteristics, Benefits and Risk Mitigation. Second Edition. URL: http://www.iwmi.cgiar.org/Publications/Books/PDF/irrigated_urban_vegetable_production_in_ghana.pdf

You need to define your potential customers and find out where they are located, what solutions they are looking for and how much they are willing to pay for it. Add any other information you have on your customers that you deem relevant for your business idea.

Finding a market gap and solving environmental and societal challenges is important if you want to launch a successful RRR business and benefit from public and donor funding. Next to developing a business idea with potential market and institutional demand, you also need to make sure that there is a fit between your market-based business idea and your own passion and know-how. So, you need to answer the following questions too:

3. Is this business idea something that you are good at?

Running a successful RRR business does not necessarily require a university degree in civil engineering, but you need to have know-how about the technological processes required to turn waste into a RRR product. If you do not have this know-how yourself, team up with a co-founder if you are a start-up, or engage in a partnership with or employ a consultant if you are working for a municipality or treatment plant that wants to launch a RRR product for cost recovery. Whether you have the engineering degree or not, you must also create a technical prototype of your needed technology and product, so build a small-scale biodigester, produce compost in your backyard or produce some batches of fish in test ponds at the wastewater treatment plant.

4. Is this business idea something that you love doing?

Finally, you want to find a business idea that corresponds to what you love doing. You should like the idea of handling organic waste or faecal sludge – even if you will eventually have workers doing the collection, sorting, treating and so on for you. You should also like dealing with people. Launching a business with a novel product means a lot of marketing and sales efforts especially in the beginning and also getting the required scientific, operational and financing partners on board. Even if you are just launching a RRR product for a municipality or treatment plant, you need to make sure that your workforce is motivated to venture into this new line of business. Having a motivated workforce has an important impact on your overall operations and bottom line!

If you have identified a business opportunity - so a business idea that is needed in your local area and that you will get paid for – and that corresponds to what you love doing and what you are good at, you have found your sweet spot; congratulations!

If you are clear on the challenges that you want to tackle in your local area but you are still not sure on how to get paid for it, I recommend that you have a look at the publication by the International Water Management Institute: “Resource Recovery from Waste. Business Models for Energy, Nutrient and Water Reuse in Low- and Middle-Income Countries”. This publication is a rich compendium of business options for energy, nutrients and water recovery and it is based on an in-depth analysis of over 70 empirical cases, of which 47 from around the world are described and evaluated in a systematic way in the publication. The focus is on organic municipal, agro-industrial and food waste, wastewater and faecal sludge, supporting a diverse range of

business models with potential for large-scale out- and up-scaling. All of the business case examples we use in this course are sourced from this publication.

So, once you have identified your sweet spot, go and head over to the introductory video of module 2!”

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
- Find your Sweet spot: adapted from graph by dreamstime

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