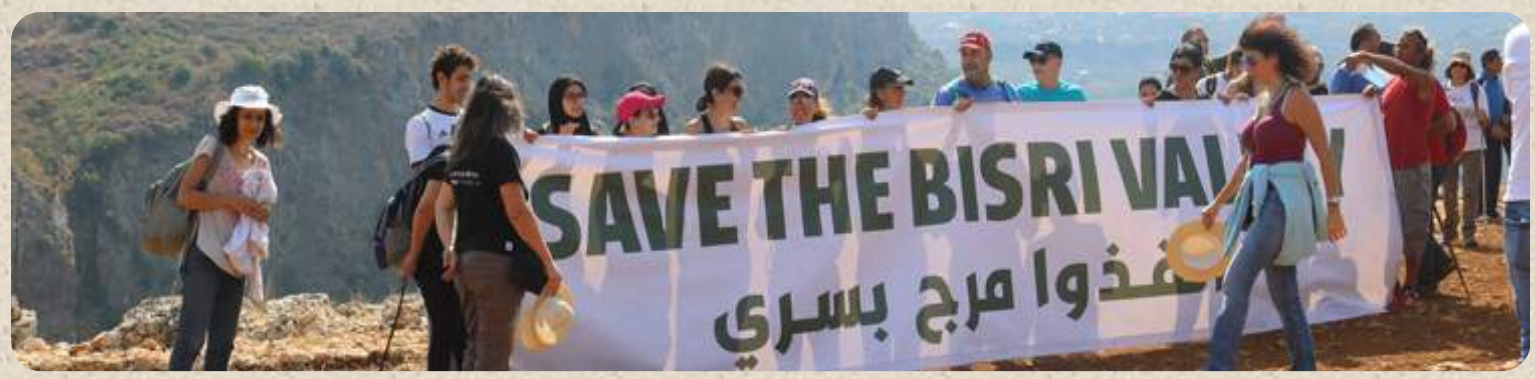
L.E.T.S. Lebanon

Issue 50, September 2018 - February 2019



• Creativity • Collaboration • Continuity • Community

IN THIS ISSUE:

FEATURE STORY

BISRI-LEAKS: THE STRAIGHT FACTS ABOUT THE BISRI DAM

Lies and misdirection. The **Bisri dam** will NOT solve the problem of Beirut's water shortage. It will NOT be an economic and touristic boom for the region.

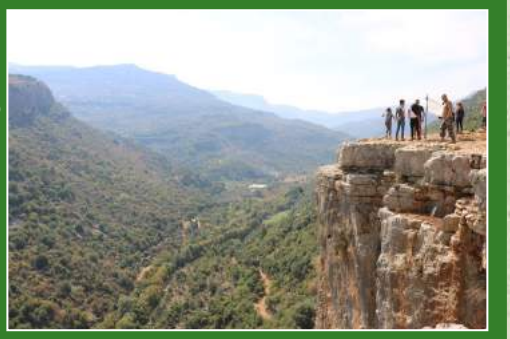
For the better part of a year, now, this is the propaganda that the mainstream media and politicians behind the project have been feeding us. These claims fall under the umbrella of "lies-to-the-people" we have grown used to every time we are faced with a controversial governmental decision of epic proportions. Think of the "garbage incinerator files" or the myriad of poor urban planning and infrastructure "scandals."

The truth is that the Bisri dam will be an economic, social, cultural, and environmental disaster, not just for the region, but for the country as a whole.

As we write this story, a demonstration is planned for Monday, March 4, 2019 at the Beirut headquarters of the World Bank responsible for funding the dam. Now, more than ever, it is crucial to clarify the issue in order to intensify opposition to it.

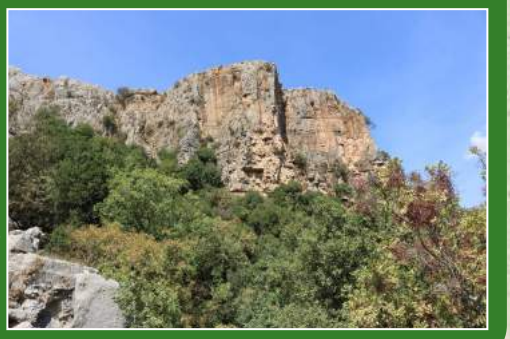
WHAT IS THE BISRI VALLEY?-

Last October, we had the chance to take part in a hike organized by the **National Campaign to Protect the Bisri Valley - Lebanon** and the **Lebanon Eco Movement** to discover the Bisri valley up close and personal.



The Bisri valley (مرج بسري) comprises **6 million m²** between the **Chouf** and **Jezzine** cazas in what is considered a natural protected area (based on Article 131/1998). The **Bisri River** goes through the valley before rejoining the **Awwali River**.

From the **Mazraat Al-Chouf** village, we climbed down an impressive Roman staircase carved into the valley's rocky cliffs. We then walked through a changing scenery of riverbanks, marshes, pine forests, and agricultural plots, with some stops at memorable historical landmarks.



According to archeological surveys conducted between 2004 and 2008, the area contains over **110 sites of archeological interest**, including Roman ruins, the ruins of a temple to the Phoenician god **Eshmun**, the **Niha and Abou Al-Hassan forts**, the historic **Mar Moussa church**, **Saint Sophia's monastery**, and many more. Recent research has also shown that **Jesus** may have passed through the area on his way from Saida to the Bekaa.

The Bisri valley is the only agricultural plain in the region of Mount Lebanon. In addition to pine and oak forests, many of which contain centennial trees, as well as orchards of lemon and other seasonal crops (strawberries, roses, etc.). These agricultural projects are often the only source of income for their owners.

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FEATURE STORY

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Ecologically, the trees of the Bisri valley absorb **20 million kg of carbon dioxide** annually. By comparison, all the trees planted in the past 13 years have an absorption capacity of only 5 million kg. The Bisri valley is also the country's second largest rest stop for migratory birds.

WHAT IS THE BISRI DAM?-

The Bisri dam is a project funded by the **World Bank** at a cost of **$612 million**. In case you need further clarification, this means Lebanon will owe the World Bank $612 million (on top of its $100+ billion national debt).

The project's area covers almost the entire Bisri valley (**5.7 million m^2**). This means no more archeological sites, no more agricultural land, no more trees, no more birds.

The process of expropriating landowners in Bisri is currently underway. Access to the site from the village of Bisri (the "easy" access) has become restricted to keep "dangerous activists" out.

For people suffering from a water shortage and living far from the valley, this could almost seem like an acceptable compromise.

So will these sacrifices solve anything? No.

THE FACTS ABOUT BEIRUT'S WATER SHORTAGE AND THE BISRI DAM-

1. Beirut's water shortage is an issue of corruption and mismanagement

A 2014 study by the UNDP showed that **Lebanon does not suffer from a water shortage**, contrary to government claims. Additionally, the country's primary source of water is groundwater, thanks to the predominantly karstic (limestone) nature of the earth. In fact, the groundwater supply exceeds annual precipitations by 53%.

The shortage is due to several factors. First, several **unlicensed wells** are currently in operation. The improper usage of these wells has drained groundwater sources in some coastal areas, leading to saltwater seeping in to replace it. Second, the national grid is in desperate need of maintenance. A 2014 German survey showed that **30% of the water from the Geita spring (supplying Greater Beirut) is wasted due to poor conditions of the water grid**. Third, corrupt practices have led to licensing many water sources to private companies.

Rather than address these issues, the government is resorting instead to a "dam strategy" that most developed countries have long abandoned.

2. Beirut will get water unfit for consumption

What many residents of Beirut do not know is that the Bisri dam alone will not supply Beirut with water. This is part of a larger to plan to get water from the existing **Qaraoun** dam and combine it with the Bisri water in the **Joun** reservoir before it gets to Beirut (for a combined cost in excess of **$1.2 billion**). Anyone familiar with the issues of the Qaraoun dam will know that its **water is so heavily contaminated that it is unfit for consumption even after treatment.**

3. The environmental costs are huge

The destruction of 6 million m^2 is in direct contradiction with the **National Land Use Master Plan of 2009** that declared the Bisri valley a protected natural area. Losing Bisri's high capacity to absorb carbon dioxide will have serious repercussions on the quality of the air we breathe in Lebanon. The loss of habitat (trees, marshes) will also affect many wildlife species, big and small, from the different migratory birds down to the tiniest organisms like the aquatic beetle *Hydraena sidon* that is endemic to the region.

4. Earthquakes, a clear and present danger

The Bisri valley falls along an important fault line - in fact, it is from there that Lebanon's devastating **1956 earthquake** originated. Water pressure from a dam could exacerbate tension along that fault line and its effects could be felt all the way to Tripoli in North Lebanon. In 2015, the National Council for Scientific Research (CNRS) explicitly warned against building a dam in the region for those very reasons.

Hydraena sidon photo by Harald Schillhammer

WHAT IS THE SOLUTION?-

A more sustainable alternative would be to properly exploit the Geita water source. The **German Federal Institute for Geosciences and Natural Resources** has ascertained that the Geita source could supply the entire Greater Beirut area with high quality water (a much better alternative than the polluted Qaraoun water).

As the climate grows warmer, the key to an adequate water supply will be to work on conserving groundwater - not storing water on the surface behind dams where it can evaporate. Accordingly, we should working on mapping all existing artesian wells and protecting them.

At the same time, it is vital to clean house: repair the existing water supply grid to prevent losses, install water meters, and properly manage wastewater to avoid contamination.

Reported by the Editorial Team

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LET'S FOCUS

HAVE YOU "MET THE PRODUCERS" YET?

Another Wednesday afternoon, 5:30 p.m. *Miguel* unloads the produce boxes from the van and stacks them up in the **Tusk** bakery in **Mar Mikhael**. *Ghassan* who is already there helps him sort the fruits, vegetables, and preserves on the table. At 6:00 p.m., the first customers start coming in to pick up seasonal produce baskets, bananas, citrus fruits, dairy products, etc., everyone collects the orders they placed online earlier in the week and enjoys a fresh apple juice.

You could call **"Meet the Producers"** a true collaborative project. We've come together as small producers who share the same values and united our efforts to grow stronger. There's *Raed*, *Miguel*, and myself from **Les Racines du Ciel** (we provide vegetables, fruits, and preserves), *Zad El Kheir* (goat and cow dairy products), *Ghassan Al Salman* (bananas and citrus), *Jean-Pierre* and *Yasmina* from **Bassatin Baanoub** (avocados, olives, preserves), and **Buzuruna Juzuruna** (seeds, greens, preserves).

What unites us is the fact that we each get our main income from a sustainable project linked to growing food. We all met before at different farmers' markets or through common friends.

Our aim is to promote a **local economy** that **respects the environment** and gives producers the possibility of selling their produce directly to consumers (i.e. without the added cost of having middle persons) and create a space where all these stakeholders can meet.

The mechanics are quite easy, people order their produce online a few days ahead of time (by Sunday at the latest for dairy products, and Tuesday for fruits and vegetables). Then, on Wednesday, they collect their orders at the Tusk bakery where they can also buy their bread or cake.

This system is more labor-effective for producers, as they only harvest the necessary quantities (so they avoid any losses).

Additionally, the seasonal produce basket system lifts some of the pressure off producers, as it allows them to adapt the contents of the basket to the available produce. For instance, if some of the harvest was destroyed by hail, frost, or wild boars, there would still be the possibility to change the basket's contents (different products for an equal value) so the revenue stream is not interrupted.

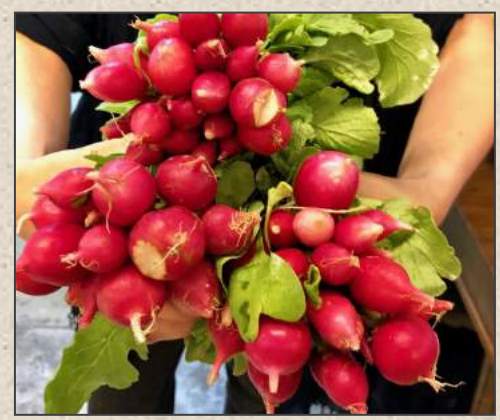
This system exists in many European countries, notably in France where it has been growing strong for over 15 years. There, the system is even more advanced and consumers agree to pay producers for an entire season's harvest in advance and in monthly payments. Accordingly, producers can adapt their harvests and cut their losses. If, for some reason, producers face a shortage during some months of the year, the baskets in that period will be less garnished, but they will make it up to customers the next season.

By showing solidarity with producers, consumers become more responsible actors for change. Showing their preference for local producers and a respect for the environment and growing seasons encourages small producers to flourish. They also get to connect with the "farm" side of the "farm-to-fork" food chain, and do so at an affordable cost.

To know more about the Meet the Producers initiative, don't hesitate to contact me at: info@lesracinesduciel.org

Shared by Joanna Parker (Les Racines du Ciel)

Photo credits: Fadi Mansour



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LET'S SHARE OUR NEWS

THE PAINS AND GAINS OF WORKING ON A PERMACULTURE DESIGN

After 4 years of being president and director of **SOILS Permaculture Association Lebanon**, I decided to take a semi-sabbatical period in February 2018 to finally have the time to finish my online Permaculture Design Course (PDC).

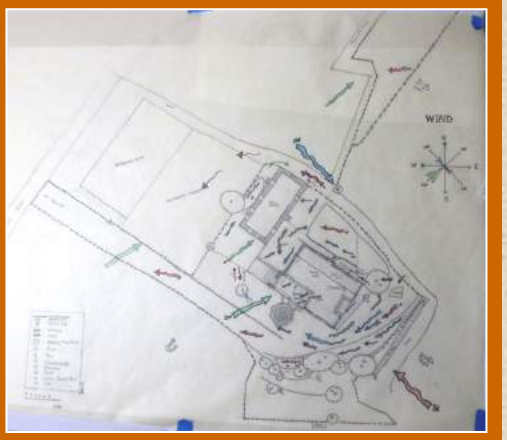
Even though I had organized 3 PDCs in Lebanon, I still hadn't officially finished mine. Another reason for this delay was that I was keen on doing a proper and comprehensive design that I would take time to implement, and not just a quick group exercise like PDC students do on a two-week course.

The site I chose to design includes the garden and house where my husband and I live intermittently, along with the adjacent site of the future AFIR Beekeeping and Nature Discovery Center future center and the garden in front of it (owned by my brother). The area is located in the village of Saidoun (Jezzine caza) at 750 m of altitude.

Tree placement on the design map; between solving a puzzle and building a Lego landscape

I started looking at my base map, which I had drawn some time earlier, and I discovered so many mistakes that I had to draw it all over again. I then began surveying the site and the factors affecting it (sun, wind, water, soil, plants, animals, etc.). Here, the hundreds of pictures and notes I had been taking over the past 5 years came in very handy.

The most challenging factor was the wind. Our house lies on top of a hill, surrounded by valleys from the Southwestern and Southeastern sides, so winds from these directions accelerate coming up the hills then funnel between the house and trees. Some days, the wind seemed to come from all directions, which was very confusing. I started going out on windy days holding a scarf, standing in different spots, and recording in which direction the scarf was moving, then I'd look at my phone weather app to know where the wind was "officially" blowing from. This, in addition to my family's memories about the damaging eastern wind that used to affect their tobacco seedlings in early Spring, gave me a clear idea about wind movement on the site and the location of sheltered spots.



Wind sector map

In addition to drying up the soil, the wind negatively affects tree pollination because it limits the activity of bees, so wind protection had to be a major focus of the design.

After surveying the land, I started interviewing the people who will use the site in one way or another, beginning with myself. Writing down questions and answering them on paper made my ideas more clear. I then interviewed my husband and brother, mainly about what they'd like to have and what resources they'd like to invest. While my husband is quick to admit his understanding is nowhere near as exhaustive as mine, he sums up our vision of the space very aptly: "A simple, aesthetic, multifunctional space that is in harmony with wildlife and produces some food."

Walnut tree mulch basin

As for my mom and 7 other siblings who grew up in that house with me but now live in Beirut, I only asked them what fruits they liked to eat and made a list of the most popular.

I then started analyzing all the info I had gathered, beginning by defining the key functions needed on the site (such as food production) and the supporting functions (such as soil improvement). And for each function I drafted a list of potential systems (e.g. nursery) and elements (e.g. pots, seedlings, potting soil, etc.) needed to accomplish it. I tried to choose systems and elements that are simple and result in the biggest effect for the smallest change. I'll give two examples:

- for greywater treatment, I decided to have the water flow by gravity directly into mulch basins of trees and be filtered by the micro-organisms in the mulch.

- in order to increase heat collection from the winter sun, I chose to enlarge an existing window in one of the south facing living rooms, and add to it double glazing, while having a retractable awning in order to block the summer sun.

At this stage, a major point to look at is connectedness: how can the different potential elements be related in order to create beneficial relationships in the system?

Decompacting soil that has been driven over for over 20 years

I sent the first design concept to my tutor Caroline and her major feedback was that the suggested windbreak didn't seem to protect the site enough. So I spent the next few weeks re-designing a windbreak hedge that doesn't block the beautiful sea view, doesn't compete a lot with fruit trees, and doesn't damage the septic tank, but can still provide good protection. And I came up with a design that included a mixture of medium and short trees, shrubs or climbers, mostly native, that also produce food or attract wildlife, such as: wild pistachio, pomegranate, Mediterranean buckthorn, myrtle, *Spartium junceum* (وزال), Goji, blackberry, honeysuckle, rose hip, etc. I had other non-native species on the list which I discarded due to their potential invasiveness, since we live in the countryside.

After drafting a few concepts and moving the trees around the map using card cutouts, I arrived to my final design in November 2018. It took me almost 10 months but was such an incredible learning journey.

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LET'S SHARE OUR NEWS

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So far we managed to: plant some of the trees, de-compact the soil in parts of the garden, finish preparations for the greywater system, and complete infrastructure/earthwork work in the AFIR garden. I am planning to implement the rest gradually by Autumn 2020. And in between I can observe, interact, and learn.

I'll be detailing different aspects of the design in future articles, so stay tuned.

Shared by Rita Khawand

Finally the tree planting

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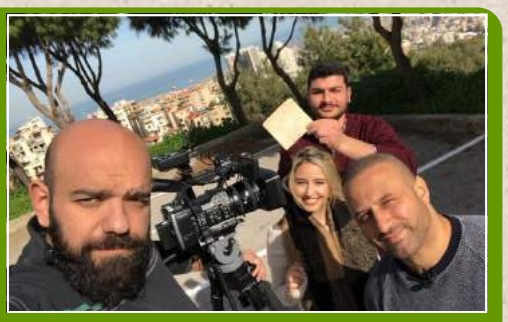
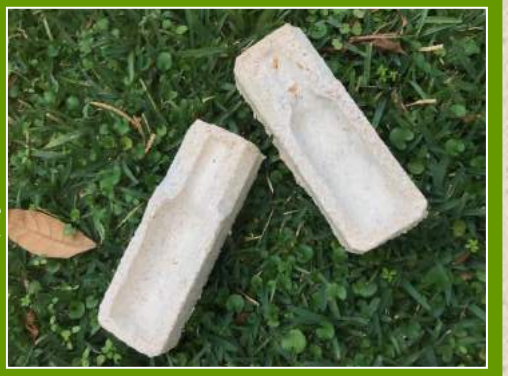
MUSHTIC IS THE NEW PLASTIC

The 2015 garbage crisis marked a new low for Lebanon. Political maneuverings had sidelined the vast majority of the population and we found ourselves mere spectators of a - literally - stinky situation. I knew the solution would have to be the sum of many initiatives (recycling different materials, reducing waste, finding alternatives to non-recyclable materials, etc.) and I wasn't yet sure where I would fit in... that's when I received that phone call from *Charbel Sayah*, asking me to join the founding team of "**Mushtic."**



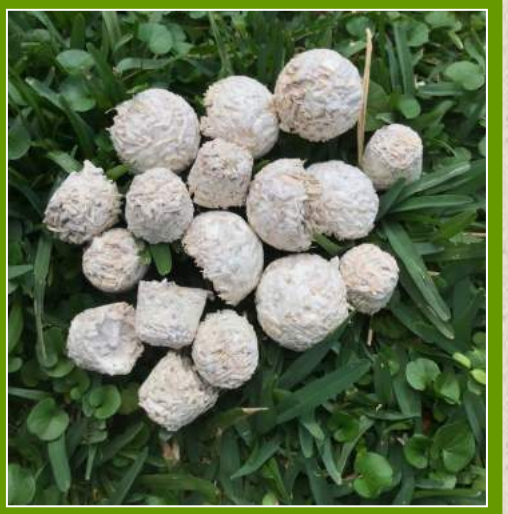
Charbel had met the two other founding members, *Lama Antonios* and *Michel Semaan*, at the **Berytech Startup Weekend** in **March 2018**. The trio had decided to focus on developing mushroom-based alternatives to petroleum-based disposable products, as a way of reducing non-recyclable waste in Lebanon and keeping harmful chemicals out of our land, water, and - ultimately - bodies. They had coined the name "Mushtic" which is short for "mushroom plastic," then gotten into **Berytech's Tech Challenge Hackathon** the next month. That's where I came in and we started to grow Mushtic together.

We decided to start taking action and implement our first innovative solution by creating an alternative to one of the most harmful materials to the environment: **Styrofoam**. Styrofoam is the worst type of plastic in many different aspects: worldwide, only 1% of the 14 million tons of Styrofoam produced yearly are recycled. The US produces 3 million tons of Styrofoam annually, yet the hidden costs of this Styrofoam (greenhouse gas emissions, disposal and environmental cleanups, and exposure-related diseases) are estimated at $7 billion.



Mushtic's technology uses agricultural waste sourced from local farmers and mycelium that we grow in-house to form a material that has the same properties as Styrofoam in terms of temperature isolation, waterproofing, and shock resistance, while being 100% biodegradable and customizable in terms of shape and design.

We've been working nonstop from day 1 to help replace Styrofoam with Mushtic, and our main driver is the passion and compassion needed to heal a planet desperate for green solutions. However, being agriculture and food science students, we had no background in business management, so **Agrytech**, the agri-food innovation hub by Berytech, provided us with workshops, boot camps, business support, guideline setups, business consultancy, and more - all of which has helped us grow as a startup and reach our targets along the way.



Currently, we are still incubated at Agrytech and are looking to raise capital in order to finalize our product, test and certify it, and start producing the first Mushtic batches for our confirmed potential partners.

We faced many challenges along the way, but our most daunting one was finding the most adequate market to target, especially in a region where the eco-friendly mindset is not yet widespread. After months of pivoting, we finally found our call: shipping companies. Increasingly numerous Styrofoam bans around the world have disrupted these companies' operations, so what would be better than bringing them Mushtic as an alternative? To that end, we are currently focusing our R&D and industrialization efforts on producing standardized panels and packing peanuts for different shipping needs.

Just like every breakthrough product or service, Mushtic started with an idea shared by a group of people willing to put in the effort required to make it a reality. All it takes to bring your vision to life is the right amount of work, dedication, and faith. Lebanon is a land of opportunities for innovation and creativity. With the ever-growing unemployment crisis and brain drain we face - not to mention the environmental issues - building fresh ideas from scratch and developing new technologies might be just what the doctor prescribed.

Shared by Rayanne Beayno

Find out more about Mushtic on Facebook:
https://www.facebook.com/Mushtic-478554519317942/

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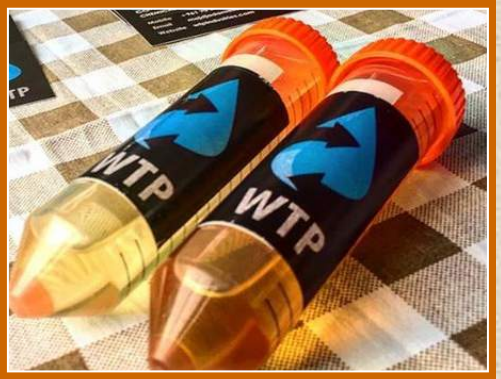
LET'S SHARE OUR NEWS

LOCALLY-MADE BIODIESEL IS NOW ON THE LEBANESE MARKET !



It all began at the **University of Balamand** when I was helping two of my students with their master's project. Before we knew it, *Majd Jadam*, *Hassan Samad*, and I found ourselves in 2018 at the head of **Waste To Power (WTP)**, our very own startup aimed at managing, reusing, and converting waste and waste sources into benefits for the general public.

Today, our ongoing objective is to make power accessible, sustainable, and efficient in Lebanon. For now we are focusing on **biodiesel**, specifically by eliminating the improper disposal of **used cooking oil**. If discarded inappropriately, used cooking oil can contaminate the soil and underground water, harming plant life and our agriculture. We collect waste oil from households and restaurants, process it, and turn in into biodiesel, an environment-friendly alternative fuel.

a) We carefully collect the oil ourselves in environmentally-safe tanks that eliminate risks of leakage and other forms of contamination. b) We then apply cutting-edge physical engineering techniques and technologies to produce premium biodiesel. c) Finally, we sell our product to individual owners of vehicles and electricity generators who share our mission of reducing pollution and choose environment-friendly biodiesel instead of the much more polluting conventional fuels.

If you are interested in disposing of your used cooking oil or acquiring biodiesel for your vehicle or electric machinery, by all means, contact us and we'll be happy to work something out.

We are now looking to expand and upgrade our facilities. With the help of our industrial partner **Agrytech**, we have set up a fully operational chemical reactor with a **1,000 liter capacity** to produce our biodiesel. So it's only a matter of time before we conclude the necessary partnerships we still need across the industry value chain to start large-scale production and become "first-to-market."

Additionally, we are considering working cooperatively with municipalities to collect greater quantities of used cooking oil to be converted into sustainable biodiesel.

Shared by Hilal El Merhubi, PhD

Find out more about Waste To Power (WTP) by visiting our **website** www.wtpindustries.com or follow us on social media to stay up-to-date with our news: **Facebook** Waste To Power - WTP **Instagram:** wtp.industries

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Email us at: contact.soilslebanon@gmail.com

Editor in chief: Alexis Baghdadi

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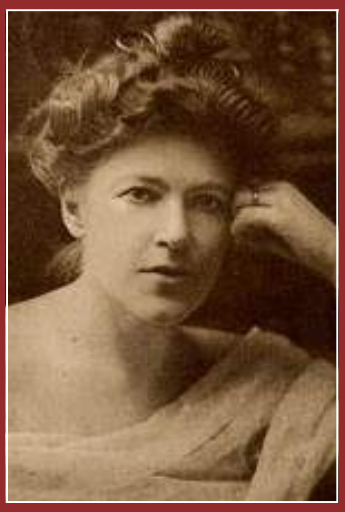
A THOUGHT TO SHARE ...

**"To sin by silence, when we should protest,
Makes cowards out of men."**



–Ella Wheeler Wilcox (1850-1919)
Poems of Problems

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