**C1 - Interview second degree cooperative, Jaen - 25-10-2021**

This is our factory [name], this is the cooperative [name], in [place], here in Jaen. And this is one of the biggest producers of olive oil in the world. We have .. 100 million kilos in one campaign, of olives. We produced over 20 million kilos of olive oil.

This is our cooperative, an *assembly that I have prepared* (una asamblea que tengo preparada), our cooperative belongs to a cooperative that we call of second grade (de segundo grado), that represents 26 cooperatives. And what we do in this secondary cooperative is commercialization, together. So the primary cooperatives produce the olive oil, they treat the olives with their members and the secondary cooperative commercializes it.

We, our members, take the olives, we bring the olives. Our cooperative has 1800 members, these are both small and large producers. They bring their products, we take the olives. We process them in a physical way (una manera fisica), not a chemical way, with centrifugation, pressure, grinding, decantation. Out of this process, you get oil, and also subproducts/byproducts, that we call alpeorujo. The oil goes to our bodega/store, and [NAME], the secondary coop commercializes it in bulk. The cooperative of [name] does not sell the olive oil, [NAME] does that. And all our production, we take to this plant. Here we have the ‘balsas’ where we leave the alpeorujo, here we have a turbine, because of the location where we are, we dry with gas, to get rid of the 70% moisture that it contains. We use an airplane turbine, we burn gas which generates energy and with the remaining gas, we dry. We get rid of the moisture and then we take it to this zone, extraction of orujo. Here we do use chemicals, what we call ‘el sano’, and here we take out the rest of the oil that it contains. That is ‘aceite de orujo de oliva’, orujo olive oil, the rest, called orujillo, is dry and without oil/fat, is send to this plant, which is a power plant (planta de generacion). Orujillo is burned and we produce energy. So here we have a co-generation turbine that runs on gas and here we have a power turbine that produces energy. So here goes all the production.

**So you use all the alpeorujo in this process?**

Yes, there is a part where we sell the orujillo. So we start with alpeorujo and once it is processed, it is orujillo. This orujillo we sell primarily to this factory, but we also sell it partly to cement companies, or porcelain companies that use biomass boilers. They buy it so they don’t have to pay emission rights. They substitute carbon with biomass in their ovens. So this is what we are currently realizing.

Here we have the dryers, we try to improve their efficiency. We have a process of three phases. In order to get oil from the olive mass (alpeorujo). Here we have ‘el decantor’ (centrifuge), and from here we get oil and olive mass (2 streams). Before, and we are going back to that process, we have 3 streams olive mass, alpechin (waste water) and oil. This mass (with 3 streams) has 52% of moisture, and this mass (with 2 streams) has 80% of moisture. So the performance of the dryer is better. This alpechin goes through a process, where we evaporate the water and a substrate remains. That substrate has a lot of antioxidants. We use this as organic fertilizer.

*He has a presentation that he will send to us*

This is the new process/plant, we will change the process to three phases, so the dryer works more efficiently and it is less expensive.

The water that remains is very salt, but you can treat it and re-use it in the installations.

And in the olive mass, there is also the olive pit. Here we have a very important boiler, to generate heat or for the plant. The pit they use a lot here in Jaen to heat houses, hospitals, schools. A lot of producers, inhabitants have heaters that run on these pits, the pits are used as biofuel. That is good, because the pits have a high calorific value and leaves very few ash, so it is easy to manage.

So we have orujillo and also the pit. Orujillo is used for industrial boilers, pits are used in heaters in houses/non-industrial. We also sometimes take the leaves, mix it with orujo and manure, to make compost.

*He is showing some pictures, also of olive fields where they use ground cover* (*ask next time about cover crops)*

The energy that is generated at the plant is supplied to the grid, it could generate energy for a city with 30.000 inhabitants.

So, you have the olive, which contains for 20% of oil and 80% of alpeorujo, which in our case are about 400.000 tons. We take that to the extractor, from there we take oil from the orujo, the orujillo, water steam and pit. The pit is about 1% because the olive mill takes 8% of the pit.

**And do you sell all the orujillo? Or what part of the orujillo do you use in the factory and what part do you sell?**

We sell most of the orujillo to the plant, because we are also business partners (socios). The majority (65%) is owned by a French company, we have 17% and another company 15%. And in that way, we share the gains. This plant burns the orujillo, about 90.000 tons, the other 30.000 tons we sell to other industries. And the olive pits we also use for the process and about ¾ we sell.

*He is showing the powerpoint, that he sent to us as well, I’m skipping this part*

It is necessary to remove the oil that is still in the alpeorujo, to be able to burn it.

*He is showing a picture of a new plant. Where they try to remove the moisture from the orujillo (so instead of the 2 streams, they use 3 streams (oil, olive mass and waste water). From the aplechin, a rest product is left (after evaporation), but they still need to see what kind of product that will be. This is a new plant.*

*He is showing some newspaper articles about contamination problems in the area around the new plant. But these problems are not due to the plant, but due to the heaters that the inhabitants use, they don’t have filters. ‘We have focused a lot on that the inhabitants should use the heaters based on biomass, but we didn’t focus on what kind of heaters that should use.’ The concentration of small particles is too high in this area. But this is not due to the plant. Therefore now, they are putting a plant there, to treat the olive pits, to remove most of the moisture, so when you burn it, it releases less particles. That is a new project they’re developing.*

**So all these heaters use olive pit?**

Yes, you can also use wood, but most use olive pit. It has high calorific value. But is needs to be olive pits of high quality, otherwise you get problems. But we are in a location without electricity, so we want to do a project with wood from the olive trees and orujillo to generate electricity. But we can’t do it now, because we don’t have electricity.

**Can you tell us a little bit more about the olive producers? Are they small, big?**

In our cooperative we have everything, small and big. The average number of hectares is between 3-4 hectares. Our cooperative has 14.000 hectares, divided by 1800 producers, we have 7 hectares. But there will be producers with 200 hectares and producers with half a hectare. The country side is very distributed/divided.

**And what percentage of olive producers depend on the production of olives for their livelihoods?**

Maybe a 30/40%, for the rest it is an extra activity to earn income. The majority are mechanic, and has olives, baker, and has olives. In our area, everyone lives from the olive, but they also have another job next to it. The professor, has olives as well.

**Is the cooperative also involved in the pruning?**

No, the olive farmer does that. Because of the problem that I just showed you (air pollution) there are 4 municipalities that prohibit burning of the pruning waste or burning of wood. Villacarillo, Castellar, (and 2 I didn’t hear well). So now the farmers really need to get rid of it. There are some companies that buy the pruning waste and sell it as biomass. But we cannot burn the wood because of the high amount of small particles in the air. So we need to find solutions for that.

**And this is only the case in these 4 municipalities?**

Yes, we have this in other places as well, but in other places they burn the waste, but here they can’t do it. They have to sell it. But burning is also a waste, loss of a benefit. So we need to find ways/markets to sell it. In these municipalities, the farmers need to get rid of it, they can’t burn it and they can’t leave it on the fields, because that might cause diseases/insects. So this is an extra cost for the farmer, to find a solution for this wood. According to the PAC, you cannot leave it on the fields. (PAC = politica Agricola comun/common agricultural policy CAP of EU).

**And what are the main challenges in the sector?**

That the subproducts have a sufficient value, can be valorized sufficiently so the farmer can obtain more income. Because the income from the olives, you only get for the 20% of the olives, let’s try to make income from the other 80% as well. Our extraction factory, the dryer, we have a rentability that we distribute back to our members of the cooperative. We do this process, but we are open for other ways to treat the subproducts, it could be biogas, it could be biochar. We are working in that area, to generate other businesses with the subproducts that we have. There are some projects that we want to start, for example a program focusing on regeneration, with help from the European Union, in the coming 3 years. The help from the EU after the COVID pandemic will focus on the energy sector, renewable energy. We try to start projects to valorize/use our subproducts. It is a challenge for us, to commercialize 100% of what we produce. We are already doing it, we are producing energy, our sector already made some changes. When we had the system of 3 phases, the alpechin (waste water) was released in the rivers. And that was really bad, when it didn’t rain so much. Fishes died. The sector adapted and they don’t dump the waste water in the river anymore. So, instead of the system with 3 phases, we now went to 2 phases. Well, now we are doing a new process of 3 phases again. But, what we do now is to recover the water, which is a scarcity here.

Another challenge is that the primary cooperatives change again their system of extraction, to for example use the waste water and treat it/recycle it, and use the subproduct.

**What are the main challenges for the olive farmers?**

The main challenge is that we have a good product, which is of high quality and healthy, that is now also consumed in other countries that before didn’t use it, for example the US, I think it is the second consumer in the world. Because the alimentation that they used before is not healthy, so it has increased a lot in those countries. But there is a paradox, there is also an expansion in production. And the expansion of production has increased more than the increase of consumption. So, there is no equilibrium/balance. When the production is higher than the demand, the price drops. The challenge of the sector is, that the price will become more stable and that the price that farmers earn will be better, viable. So the world population absorbs the production of olive oil. It is a process that needs more work that oil from seeds or sunflower, or palmoil. We are surprised to see the rising demand of palm oil, while the environmental impact is really big. And it is also not that healthy. So we are sometimes surprised to see that the economic interests are larger than the health interests or sustainability. The luck that we have is that we have a healthy product. There is fat in our product, but we also need fat. Olive oil is one of the best fats there are in the world. So we need to increase the consumption, and also a system that regulates the market, so the prices will be more stable. A mechanism, that regulates when there is over production. In the past, this was voluntary, but it didn’t work. So what needs to be done is that when there is over production, you have to withdraw a certain percentage of your production. Our government has to implement this, in a year when there is too much production, to prevent the drop in price.

Our product has a lot of positive nutritious qualities, we want this to be put clearly on the label of the bottle, so the consumer understands this is a healthy product. We are now talking to our local governments, so they permit us to do this. But it is clear that the countries that use a lot of olive oil in their diet, people are healthier. We just need to convince the consumer.

**And what are the challenges related to sustainability?**

The water use in olive production is a local threat, we need to find ways to use less water. *He is showing an image, where they use less water, but still have good production.* Water is necessary, without water, there is no rural development. We need to use water in the most efficient way, and olive production is an efficient way to use water, a lot less water is used than for example in corn production. 1000/1500 kubic of water per hectare, and they produce olives. We are doing more and more ecological production. The rules that come now from the European Union, from Farm to Fork, the new philosophy, I think it is important. We pay attention to ecological farming and also integrated production, we have a lot of possibilities, because a lot of farmers already do it. It is just a question of administration. It will take some time, but I think the olive production will be one of the most lively production you will ever see. We are now also using some chemicals, but if you compare it with other production, I think it is not too bad, it is very controlled. I don’t think we have problems with contamination, with nitrate, caused by the olive production.

***I am showing the biohub infographic and are talking about traditional uses of biomass.***

We sell a lot of orujillo to the UK and Poland, within their energy policies, biomass played a central role. So we sent a lot of orujillo, but with the crisis of the past years, the state is reducing this support, so the use in those countries declined. This created a problem, because we had too much, we couldn’t sell it. First it was 40/50 euros per ton, now it declined to 12 euros. It was saturated. We had a problem, thanks to the turbine we have, because we burn it, but other companies that didn’t have it had a problem. And now, because the carbon emission prices have risen, the companies that produce cement etc. are now looking for biofuels instead. So now the price for orujillo has risen again to 45/50 euros per ton. So we have a use/market for the product, but it is true that this was with support, with a premium from the government.

*I am explaining the byproducts*

The biochar can be used in the fields yes, as compost.

*And that the end product will be for the maritime sector, he is surprised about that*

It is currently not economically profitable, with the oil from orujo, they make biofuels, but it is not very profitable. So, there is no market for the biofuels from orujo, and then the price drops.

But oke, I told you that we are also working a lot in this line, with Pepe La Cal, we will start projects like this in the coming years.

**Oke and what do you think of this concept?**

Very good, I agree. This part of the project, we are generating, and in the 6 weeks that you are here, you will see. And if you want, we can prepare a visit to our facility and you can see it. We are starting collecting the olives from the 2nd of november onwards. We start with a few, and end with a lot. You can see it there, and the responsible person for our factory can show you. You know already what olive oil is and how that’s produced, but with us you can also see what we do with the byproducts. We can go to [name].

**Thank you, we would like that very much. And apart from the orujillo, we are also interested in the pruning waste.**

Well, the pruning waste is currently a problem, we could use it to make biochar.

**And what kind of benefits could this biohub or a system like this generate for the region or for the farmers?**

Now, the pruning waste is a problem, so if we can find a profitable way to eliminate the pruning waste, this can help. Now it is a problem and a cost. For our project where we want to use the pruning waste, we need to have electricity. In the area where we want to do it, there is no electricity, so now, we are asking our government to create an electricity net there.

About biochar, we are working with various projects, also with Pepe La Cal, to see how we can produce and use biochar. It’s interesting because biochar, we are making and using it since our grandparents. What we did was, we took the wood, you cover it with dirt/sand and they burned. Finally, it became a biological char, we put that below the table when we ate, to become warm. It is very old custom. But now, if you produce it well, it can be a good organic fertilizer. Biochar can be a good alternative income source. Because we have a lot of biological material. Not only the 80% of the olive, but also the pruning waste, the leaves. If we can find a better solution. But this is important, it should be located in the area where it is produced. When you are going to transport anything, it should be a final product, otherwise it will be too expensive. Transport is very expensive. So the project should be located in the area of production. How lower the distance or the transport needed, the better. When the product is finalized, then it can be transported.

That is also what we did with our project, we looked at a central place, with access to a number of cooperatives and mills nearby, so the transport is not too much. And we collect 400 million kilos of olive mass. That is our success, the displacement is short and cheap.

*He is showing the image of the facility [name], which is close to [place] (the best region to produce olives according to him, because they don’t use a lot of pesticides) and here they have access to a lot of biomass close by, biomass from the forest, biomass from pruning and from the olive mills.*

So this turbine is owned for 90% by a French company, and the plant that is burning orujillo is owned by EMSE, a biomass company. (<https://ence.es/en/>). Normally we should pay 100/120 thousands euro per month for electricity, with the current prices, but now we are paying nothing. We have in our contract that when the energy prices are low, we pay more and when the prices are high, we pay less. So now, we don’t pay anything for the electricity for drying, because of the profitability they have by selling energy. It is an exceptional situation. But in the future, it is important to be self-sufficient in relation to energy.

But it opened my eyes, that you need to be self-sufficient. Now with the high energy prices, there will be people that won’t be able to pay for the minimum that is needed, they will be cold and suffer. You shouldn’t be dependent on other countries for energy. Also regarding our food.

There are essential elements, like energy, food and water, should be controlled by the European Union, we shouldn’t depend on others.

*(he is now talking about nuclear energy, and that that’s necessary)*

So in the future, if the gas prices will be more expensive, there is more opportunity for green energy.

*He is making a remark about the term refinery in the biohub, that this is a step in the olive oil process as well, that might confuse people. The bad quality oil, needs a refinery step, where all the smell and colour is removed. That is also called refinery. So when we show it, we should make clear that we mean something else.*

***I am showing the power-interest grid and asking about the positions***

The olive mills and cooperatives should be around the same level. If we are talking about subproducts, we should think in collectives, individual farmers cannot do or start anything, it should be done collectively.

But yes, I agree, I see more in collective work, than individual, or maybe it should be a very large producer.

Yes I think this is alright like this.

***I am closing down, Siva has some questions.***

**Are they burning the pomace in the facility because it is economically beneficial or they don’t have any other use for it?**

Yes, we can say, it is a plant to eliminate the residues. The volumes of residues are very high. Where do we have to leave it? But if you want to make compost, but what are you going to do with that amount? So we have to do something. It is a problem, we have to eliminate it.

Here you can see the emission rights, the price of orujillo is related to the carbon emission price. If that price is high, companies are looking to greener energy, like orujillo. And the state gives support to companies that use green energy. When the emission price is low, they burn carbon, but when the price is high, they look to other sources.

*He explains the whole system of emission rights now.*

But it is very important to process the products near the production sites, otherwise it is very expensive, you will be transporting water, and this water is worth nothing. You need to eliminate the water in the area where it is produced. Water in this type of processes is a problem, you need to eliminate it. We use a lot of heat to get rid of the water, by evaporation. Yes, you maybe can recover the water, but that water will be very expensive, it is cheaper to use the water from the net.

**And is everything/all the alpeorujo processed in the secondary industry?**

Yes everything is used. There are some small mills that use it to make compost, and Pepe La Cal is doing a project, where it is used to make other products (gasification plant) but otherwise it is all treated by the secondary mill.

**Do you think the secondary industry is going to increase?**

It depends on if the olive production will increase. I don’t like to say it, but they are like factories that have to purpose to eliminate the residue. Because the volume is that large, and you need to take it to a facility to process it. I said in a presentation, if the facility of [name] didn’t exist yet, you had to invent it.

**Do you expect the demand for olive oil to increase in the coming years?**

For me it is hope, illusion and expectation, all mixed. I think it will increase, I hope it. If our market would become like something like wheat, that you can grow everywhere in the world, then we are lost. But the olive is a tree, it takes some years before it produces fruits, you cannot produce it in all parts of the world. The product olive oil, if we make the consumer aware of it, the consumer will not reject it. It is a very healthy product. You need to become familiar with the taste, but then you will like it. So in countries where they use butter, they need to get used to the taste, but it is much more healthy.

Yes we have hope, because of the product it is. But if the consumption will not increase with the same pace as the production increases, we will have some problems. So we need to find mechanisms when the consumption is higher, we need to regulate the production.

**Does [NAME] or the government have a database where we can find statistics?**

* AICA (agencia informacion control alimentaria)
* Page of the junta de andalucia
* Ministry 🡪 statistics services
* Patrimonio comunal olivarero <https://www.patrimoniolivarero.com/>
* Fundacion del olivar (olive.net)
* Municipios del olivo

*(He is very willing to take us to the facility and cooperative. He can also introduce us to some farmers. When we visit the cooperative, they can invite some farmers)*