**C2 - Interview second degree cooperative, Jaen - 27-10-2021**

**To start, could you please introduce [name coop] and [name coop] to us?**

[name coop] is a primary cooperative that has 5 olive mills, 2500 members, and a production around 40.000 tons of olives, so about 7000/8000 tons of olive oil. It is located in [place]. [name coop] is member of an agrarian organization, [name coop], where I am also president. We have 32 members, of these 32, 22 are cooperatives and 10 are private olive mills. The objective of [name coop] is commercialization of olive oil in bulk. In total, we commercialize around 65.000 tons of olives. There are members from Jaen but also from Cordoba, Granada, from different places.

**Could you tell us a little bit more about the olive producers? What sizes, what cultivation method, etc?**

The majority is traditional, *de secado*, not mechanized. Only a few are irrigated, there is a lot of variety in production, which depends on the climatology. The average size of our members is around 4 hectares. There are members that have 1 or less hectares, but some have 100, it depends. For the majority, it is a complementary activity, they have another job, for example they have a company, or civil servant. In [name coop], we work in an area where there is irrigation, so the production is higher and more stable, on the same plot size. The average plot size in Jaen is 3 to 4 hectares, there is a challenge, that is also present here in [place], that it is very divided (*muy parcelada*). There are parcels with 1 hectare, one with 3 etc. It is divided in different parts. In [name coop] we have 9000 hectares, in [name coop] I don’t know. In [name coop] we have about 18.000 members.

**And what activities does the cooperative offer to the members?**

Our cooperative first focuses on the sale of olive oil, we sell it via [name coop], and what is not sold in bulk, we sell in bottles here in [name coop]. We have a commercial department, with around 2/3 million liter a year, not only national but also international. Almost 30% is for export. Next to commercial activities, we have activities for members, like a credit service/credit cooperative, where members can lend money, when there is low income. This money should be spend on agricultural investments, like buying land, or machines etc. In addition, we also sell fertilizers. We also sell fuels. We also have an administrative department where we help people with all administration that has to do with agriculture, like help with PAC (EU CAP), income statement, all things where they need help with. We also have the department, *atencion al socio*, attention for the members, where we have phone lines for the members, of Vodafone or Movistar. We also have an insurance company, for machines, but also for the houses. General activities.

**What are the main challenges of the olive producers here in the region?**

The main challenge is the profitability of olive production. The price of the olive oil, that is very volatile, we have years where the olive oil price, and the income the producer receives is below the cost price. During the three previous years, the price was below 2,5 euros. The costs of production depend a lot on mechanization of the production, if it is irrigated or not, and sometimes the labour is done by family members, or you need to hire employees. But the cost is around 2,30 to 2,50. In the past years the olive producers suffered because of the low price. The problem is that you don’t know what the price will be when you start producing. You harvest the product in November/December, and you sell the product in the next year. So you need one year of investments, in order to sell it the next year. But since the price is very volatile, the price can be below the cost price. So one of the main challenges is this one. Another one is the aging of the farmers, among the younger generation there is not a lot of interest, because of the low profitability. Another challenge is modernization, not only terms of machinery, because there are enough investments, but in Jaen and especially in this region, we are not able to mechanize because of the landscape (hills). The most important cost that we have now is the labour cost during the harvest. This could be around 40% of the total costs. If we can reduce these costs, by mechanizing, you can have more profit. And also you can have more production. If there is no irrigation, that is difficult. You can try to look if there is water in the soil, but in the region that is difficult, we have scarcity of water. And also, because the land is divided in so much smaller plots, the investments you need to make for irrigation is not viable. So, what we can do is make use of waste water, water that is being used by inhabitants, and to re-use that. So we are increasing a little bit the size of the plots that are irrigated. That can double the production and also stabilize the production. So that is an important step.

**And this is something that is already happening or are you planning to do projects like this?**

Well, they do it in some villages, but only at small scale. Maybe 1000 hectares, but we have 9000 hectares. It is something, but it is a slow process, the process of bureaucracy slows down the process a lot. And there is another important transformation, which is within the dry production (pruduccion secano) is the transformation from traditional cultivation towards intensification. To replace olive trees of more than 100 years old with olive trees with just one leg, that are closer to each other. That you can harvest with a machine, that shakes the tree, and in that way cut labour costs. But a challenge is that it is also a culture here, it is difficult to replace an olive tree of over 100 years old, that you have been taking care of for many years. They don’t see it just as a olive business, it is also a culture. So it takes a lot of work and time to make that transformation. The investors that buy land here, they quickly remove the olive trees and put more intensive trees, they have a more economic view on it, to make profit. But with the culture and tradition of Jaen, that takes more work and time. We do offer courses and trainings, also today, a technical agronomist from the university of Cordoba is coming here, to talk about the change from traditional olive cultivation towards more intensive, and also towards irrigated crops. We have another course about cover crops, and courses about fertilizers. We constantly offer trainings to the members.

**And are the members open to these type of changes or innovations?**

Not based on individual initiatives. You need to present them numbers, and present them with experiences of other farmers, we take them in the bus to other farmers that are already applying it. Step by step we are working on these transformations. But it takes a lot of time and effort. It is not just a business, it is also tradition and culture, in a culture that is very reluctant to change, because they have always done it in a certain way. So in the first place, you’ll receive rejection. The same happened when we introduced organic olive oil here at [name coop], about 6 years ago. It took us 2 years to explain it, with technical advisors, taking them to ecological farms, showing them the benefits for the environment and health, but now we have an acceptable amount of ecological production. But it was going slowly.

**You also said that many olive producers have other jobs next to olive production, but are there also farmers that depend on olive production for their livelihood?**

Yes, there are farmers that totally depend on agriculture, about 30%. But they don’t only depend on their own production, but they also work for others. So if their own property is not big enough, when they will work with their tractor, they will do the same for their neighbour for example. When they are harvesting, they also do the harvest in other fields. So they live from the field/agriculture, but not exclusively from their own plots.

These are, I think, the main challenges related to agriculture. The challenges related to commercialization or for the mills or cooperatives, apart from selling the olive oil, is energy efficiency. But a challenge is the valorization of the byproducts. About 90% of the income that the farmer generates comes from the sale of olive oil. The byproducts, I don’t call them residues, the byproducts like pomace, pruning waste or pit, has not received enough attention, they are not valued the way they should be. It is now treated as a residue, something you need to get rid of, to be able to produce olive oil. But because the income that is generated from the olive oil production is limited, and it is challenging because there is rise in production, we need to look at opportunities to valorize the by products, the pomace, pits, pruning waste. And also the waste water from the olive mills. The mills evaporate it now, which is a scandal because of the scarcity of water that we have here. The best solution they could find is evaporate it. It is a bad practice, but it is cheap, and sometimes when something is cheap, people don’t look for other possibilities.

**And is [name coop] or [name coop] involved in projects using byproducts as well?**

[name coop] not, because it originated to sell olive oil. Each member has their own solution for their byproducts. So there are the orujeras (secondary industry), and there are 2 types of orujeras, like primary olive mills, there are cooperative orujeras and private orujeras. The cooperative orujero, like El Tejar, has members that take the pomace to the facility, and then they process it to produce oil of orujo, orujillo and sometimes they also burn that to obtain energy. And the private orujeras, often have a contract with a cooperative, and that contract says, don’t worry, I’ll take over the alpeorujo or orujo (pomace), and they treat it and produce oil from orujo and orujillo. So every olive mill or cooperative is looking for their own solutions for the problem of orujo. That is the system that we have now.

There are some projects, also supported by the Junta de Andalucia, for gasification, or the production of syngas. And the possible use for animal feed. That is researched now by universities. There are some projects that are trying or investigating new ways to valorise the byproducts, but these are in pilot scale. What we have now, there is a lot of interest in a byproduct that can generate a lot of energy, like biogas, or syngas, or electricity, and animal feed, or pharmaceutical products. But there is not yet a developed industry to do this yet. It is now mainly burnt to generate energy, like they have always done. But they are researching other possibilities. Here we have received some proposals by companies to produce biogas, animal feed, and asked if we could guarantee the supply of alpeorujo. In principal there is nothing concrete yet, to utilize it.

**And do you think that the olive farmers will be open to do something with the pruning waste?**

The pruning waste that can be treated, is treated and used in the fields. And the thicker branches/wood, we buy from the members and sell it to 2 or 3 companies that are interested in it. It is often used as wood for the barbecue, or fire wood, and some is used to generate electricity. We have the plan to make biochar, and the use of carbon is recommended to use in the fields, it absorbs moisture, enriches the soil, it is not fuel, but to enrich the soil. And what is left can be used in filters or in medicines. These are projects that we have here to facilitate the use of the pruning waste. We are now looking at the economic feasibility, if it’s viable or not. But it has not materialized yet in an investment. But there are initiatives, but these are projects.

**Yes, not in a bigger scale.**

No, maybe in other places, but I’m not aware of it.

**How do you do the collection, you go to the fields to collect the wood?**

No the farmers take it to the cooperative/mill. They take the wood, we weigh it and we leave it here, and then trucks come to collect it. We can do this until the end of April, because you cannot leave wood in the fields, otherwise you can get a fine. The company that buys the wood takes it to a facility, far away from the fields.

The rest, the leaves stay in the field. The wood, we collect thousands of tons of wood that the members take to the cooperative. Is it rained more, there will be more pruning waste, if it rains less, the pruning waste will be less.

**What are the challenges related to sustainability?**

For one part, the abandonment of the traditional agriculture. The conditions are different now, it rains less. So we are now stimulating cover crops, to demonstrate that it is beneficial, also for the olive grove (Olivares vivos). To generate a system that is regenerative. We are in a very dry climate, after April, it almost never rains. You need to be careful with cover crops, because it shouldn’t compete with the water that is needed by the olive trees. Here we planted some herbs in between the traditional olive trees, but it is a bad herb, because it affects the humidity of the olive tree. So, if you have cover crops, you need to treat it well. If you do it well, it can benefit the production of olive trees as well. That is what we want to show the olive farmers, because that is how it works, if you don’t show it to them, they don’t believe it. Because it takes work.

Here, we use less and less pesticides. We have an agronomist working for us, who looks at that. We are dosing the amount of pesticides that are being used, he advises us. But, this also is going slowly, it takes years. Like I said before, we are very reluctant to change. We are doing things because of our culture, because we’ve always done it like that. Because it is always done like that, it is not a bad practice. Well, we need to break with that idea.

Chemicals are used on the soil, because the olive tree uses a lot of nitrogen, phosphor and potassium, the soil that we have are not the best soils for the olive trees, so they need a little help.

**And about the cover crops, do you think it is possible to plant energy crops in the middle of the olive trees?**

Yes, there are studies about planting energy crops or aromatic crops, and medicinal crops. In the traditional system, there is a space between the olive trees of about 10 to 12 meters. In those streets, it is possible to plant vegetation that can be easily managed. There are also experiences, but that did not reach us yet, with other types of plants, aromatic or medicinal, or bioenergy. But the challenge is that the cultivation of these plants are often mechanized. But with our landscape here (hills) it is not always possible to harvest mechanically. And we need to be careful with the water needs, that it doesn’t compete with the olive tree because that is still the most important. If there is a plant that meets all these conditions, please tell us and I’m sure we’ll use it.

**Are there already pilot projects with cover crops?**

We did 2 projects, but we don’t have results, because it didn’t rain. We started 2 years ago, in 1 project, we started planning too late and it didn’t rain enough, and in another one, the weeds of the year before wasn’t removed properly. So it was not a success, both projects failed. So, we don’t want to say it, we want to continue and see if it works. Then we will share it with the farmers. Otherwise, they will have a negative attitude towards it, while it might work in the future. We need to show to them that is works. It is difficult to convince a traditional farmer based on theory. They need to see it.

***Showing + explaining the biohub concept***

**What do you think of this concept?**

Great, I am in. This is circular economy. We try to develop this here in the agricultural sector and valorization of the subproducts. And I think it is one of the main challenges that this sector has, to depend solely on the prices of the olive oil, to generate employment and utilize all the products that are generated, in an ecosystem like the olive trees. I have seen a lot of imaged like this one, and I have seen numbers on costs, volumes, etc. But it has not materialized. Do you know Citoliva (<https://citoliva.es/>), it is a technical centre of olive trees and olive oil, here in Jaen. They have experience in research, using European funds, and funds from the Junta de Andalucia and national government, with this emphasis. They do a research project, they publish their results to the public. I think they are doing a study on the treatment of the Alpeorujo, they are almost finishing that, also using residual water. I can give you the phone number of the manager.

**And you said you saw a lot of images like this, but not a lot has materialized yet. Why is that do you think?**

Well, I have seen a lot like this because I come in a lot of places, I doubt if the leader from another cooperative would be familiar with the idea. There are a lot of declarations of interest, but there are no investments. We are in the beginning phase, we know where we want to go, but we need to find out how and how much it will cost. What is hurting me most sometimes is that these are often foreign projects, that we are not capable to valorize what we have here. But on the other hand, I am happy that it receives attention.

**Because what obstacles do you see, to realize something like this here?**

The biochar, that can be made from the wood, depends on the cost of wood, I don’t know the exact numbers, but it is 5/6 euros per ton. Which is nothing. If there will be a company that will approach us and has a solution to valorize the wood, we would be very happy, for 3 euros they can have it. No problem. We are open to collaborate in that. But we are, as cooperatives, not used to invest in projects apart from the production of olive oil. Which is a bad habit. But in principle, the members reject investments in activities that are not strictly related to the production of olive oil. People only want to invest, if it is sure that they will get a return. So if there is already a company or cooperative that is doing it and it works, that they would ask, why aren’t we doing that. But in principle, they will reject it if there is not another company that is showing that it works and is viable, than I will need to work really hard to convince them.

Another thing is that we don’t know the technology and we don’t know the market. If it will generate compost, well we can use it, so that is familiar to us. So the members can invest in it, they know that they can use that amount of compost, then they are willing. But if we need to search for a market for the product, and the sale of the product is not in our sector/market, it is more difficult.

**And the use of alpeorujo or orujillo, do you see obstacles in that?**

Well, the production of alpeorujo, we have that now 1 year. It is going well, but there is a challenge related to stringent administration. The alpeorujo, we take, we mix it is the leaves and pruning waste, and we add cow manure, or we add nitrogen and use it in the fields. The problem is that for this alpeorujo plant, the environmental norms are very strict. But here, we use very little pruning waste, we use the alpechin of the olive mill. Another problem with alpechin is that it should have very low oil content. And sometimes there is more oil content, then it fermentates and needs more work.

**And could a system like this (de new biohub concept) interrupt or harm an existing system?**

If there is an alternative to the orujeros, to use alpeorujo to produce fuel, it can interrupt the secondary industry, the orujeros. They have a system that exists for centuries. We take our alpeorujo to the orujero, they treat it, take the remaining oil out to sell and sell the byproduct (orujillo). If you want to implement a system that uses alpeorujo, well, that will interfere with the secondary industry. For me, if the new system you are prosing works, I want to participate, because my business is olive oil. I am not involved in producing orujillo. We are mainly focused on the production of olive oil, we are not so much involved in the by products. Well, as [name coop] we do try to utilize it, many other cooperatives don’t, but still, our main business is olive oil.

But we produce a lot of alpeorujo, and that becomes a problem, because it is a lot, it smells bad, we need to get rid of it very soon.

**We also would like to understand which actors play a role in this sector, or in realizing this biohub, and what is the relationship between them. We created this power-interest grid, where we tried to position the different actors, regarding the interest and the power they. Would you take a look at it, and tell us what you think of the actors and their position? Are some actors missing, and is their position right?**

Let’s see, the national government and Junta Andalucia have the most power, because they regulate, they can incentivise of sanction, the carrot and the stick. In terms of power, they are well-positioned. I would put the Junta de Andalucia with more interest, probably because they are closer to the sector, to the problem, than Madrid.

Liquid transport and storage, they are well positioned, they could set the price, but for that they are also dependent on the market.

Biomass collectors, they have a high interest in that the situation doesn’t change. There are only a few companies that collect pruning waste, they have interest to valorize it, but it is true that they don’t have a lot of power. They have more interest, but the power position is right.

Communication platform is good like that.

Olive mills, we have a lot of interest, and low power, yes that is true. Not based on our number, if you look at the number of mills and the amount we produce, we should have a lot of power, but we are not united, so we don’t have that power. We have interest, because we want to solve problems.

Universities have high interest indeed, there are a lot of initiatives, and they have not that much power, because their results are often not materialized.

Olive producers, we have a lot of interest, but I would put lower power. Because we are 100.000 farmers, but we are not united, the same as the olive mills. In Jaen, there are 370 olive mills, but we are not united, we have different interests, like Real Madrid or Barcelona.

Cooperative mills, maybe they have more power than private mills indeed, because there are secondary mills, like [name coop].

The farmer collectives, UPA, ASAJA, COAG, they have more power than interest. Everything that the national and regional government does, they need to consult it with the sector. Every norm, incentive, it needs to be discussed with the sector, and the sector is represented by UPA, ASAJA and COAG. They have power, they can influence the governments’ decisions. So I would put them with higher power, but they are not showing a lot of interest for this.

The technology providers indeed have a lot of interest and a lot of power, because they are the once that can realize this, they know how to do it.

And the biorefineries also have a lot of interest and power, but that power they’re not using right now. They could ask for more interest from the government.

The municipalities, they don’t want problems, they don’t want a plant that smells or something like that, but if it generates employment.

And the maritime sector, I wouldn’t know, we are inland.

**Thank you very much. Maybe to end, we would also like to speak with some olive farmers, to understand their perspectives as well. Could you help us reach out or connect with some farmers?**

 *We gave our phone number to an employee of [name coop], he will reach out to some farmers and will call us to make an appointment.*