**24-06-22 – Interview transcript - CARDER - Colombia**

**The introduction that [ ] made was broader. Now I am going to move to something more specific. The research that Siva and Susan are carrying out, respectively, he about residue management and process, and Susan regarding the human connection approach, thus the social part. Then, part of that. The project is called BioHub, and it aims, at first, to understand this green area, the producers, and properties from different perspectives. The producer with a lot of land without education, the producer with a lot of land with education, the producer with small land with and without education. In other words, all the factors involved, and the waste generated from there, and what can be done with it. There is a topic related to waste. In the research they are doing, they have a chemical process where they use biomass, which are the residues from cocoa and coffee, in a recipient. These residues undergo high temperature and pressure, giving as a result different elements, such as crude gas, water, and carbon. Therefore, the use of these elements… Well, the crude, which is in what Siva is focusing on, we will talk about it later. Gas serves for energy, carbon is used for energy purposes too, and water can be reused in the process itself. Crude gas presents a bigger variety of uses, to make plastics, cosmetics, fuels, etc. This is what is being done. Now, within the questions, we have separate sections, which are the producers, and you as an institution. Well, and also associations, federations. But you, as an institution, we are going to start from this point. Therefore, from the organizational part.**

**The first question is that you tell us a bit about the organization. How CARDER specifically acts.**

Regional Autonomous Corporation of Risaralda is more than 40 years old. We are divided into the operative part and technical part. To say it somehow, we are separated into two sections, one which is the Territorial Environmental Management Subdirectorate, and the other which is Subdirectorate of Sectoral Environmental Management. In each of them we work on different areas of competence. The territorial one is focused on projects, education, of that approach, as I said, more social, to precisely guide all those actors in how to respect the environmental laws, and how to create different processes without damaging the environment. In the sectorial, its main function is related to control. From there, all the laws are shows, where the permissions are given, where licenses are granted… All what has an impact or needs a request, or exploitation of natural resources, they need to go to the sectorial one, they need to have the standard competition permits that exist at that time.

**Regarding residue management. At this moment, Siva and Susan are working with cocoa and coffee. However, these different products generate different residues. Is there any management, any process with the producers? Or is from the organization any process carried out?**

I do not know a specific process with the producers. In other words, what is done is that they are given technical assistance on how to carry out the processes, but it is not mass or sudden harvest, or that there is a project with the producers, no. What is done is technical assistance so that the impact, especially soil and water, is not greater. But no, a project that I know of, no. Obviously, in fact, that is why I was contacting María Emilia, at this moment she works in the field, and Beatriz, who is with the producers. They might know a little more about these initiatives. But what we do is that we take care of meeting the needs in terms of guidance, how to manage some crops. Because although we cannot ignore the role of the Coffee Growers Committee, which also works directly with them, and they do have some projects. They have a project. In fact, we had little contact with the Coffee Growers Committee, and they were promoting a pilot farm to take advantage of the *pasilla*, and for this reason, I do not know how far this project has advanced, but it does work together with the corporation from a non-damage to the resource approach because it is considered as the difference that there must be with other entities such as the Government or the Coffee Growers Committee, what is our role in terms of the orientation of the producers, the conservation of water resources or the different natural resources, and the least damage. That is our role.

**Already entering the field, in the area. Well, I would like to talk about some processes that are currently taking place. Tell us what is currently going on with CARDER and the rest of the actors, impacts, or perhaps, work with associations, work with producers. Already, as such, work being done in volumes.**

In Risaralda, the interinstitutional articulation is very good. I believe that, unlike what we have been able to see in other regions of the country, it is that here the actors speak to each other. In other words, we are almost always the same people, or it is always a relationship between officials. Yes, we talk to each other constantly, and we have a good alliance. Therefore, the government works with CARDER, with the mayor's offices, we work with some associations, we work with the Coffee Growers Committee, for example. We do have some processes in common. I don't know if they have already told you about the *Roquimática* Technical Table, it is one of them. So, as I said at the beginning, due to climate change, one of the processes is the *Roquimática* Technical Table, which is supported by the Ministry of Agriculture, by the Ideal and the Ministry of the Environment. They work hand in hand nationally, but they take it to the Departmental or local level. Thus, several of the Department's institutions can meet at that table to advise the producers a little about what are those alternatives that they must implement taking into account the changes in the climate, what are the variables that they are going to have or what can be the possibility of negatively impacting the crops and that some alternatives they can then generate. But we also have agreements. We currently work under the figure of agreements. Therefore, we work with agreements between these institutions. We advise the ***matos***. We advise the *matos*, which are medium support units for the ***matas***. They are like institutions that are in each municipality. For example, San Juan has its own *mata*, and has a person in charge of dealing directly with the producers. It is like an institutional link for the issue of the producer in the municipalities. So, we also work with the Secretary of Port Development, which is from the Government because we also have a direct link with them. For example, we work, in the case of climate change, we work in a process called the Departmental Climate Change Council, where there is the issue regarding the relationship between actors. All the time we are advising on decision-making, on the guidelines, especially on the regulations, when they must comply, how they must comply, how is all the effect. In the case of producers, for example, it is a green business approach. I think they are going to talk to you later about that, but different producers who have a clean process are brought or shown and promoted there. Therefore, that clean process, it is shown by the Corporation, for the sale of its products. A little is promoted for the sale of products that have this characteristic. Almost the whole issue of reaching the farmers, the different producers, carried out together with another institution. In general, we always have that part of education, awareness, compliance with the regulations so as not to later reach a sanction or something without the prior knowledge that they should have.

**I would like to ask something specific. Which purpose do these current practices have?**

Our competences?

**Rather than competences, the purpose of advising, or the services you give, the activities you do as CARDER.**

Our principal purpose is the preservation of natural resources, obviously, for the better living, to say it somehow, of the whole population of the Department. Therefore, it is the preservation of each one of these resources. Hence, when we focus on certain areas, for instance, the productive sector. There, the main one is that the quality of life of the producers is not severely affected. Because it happened. Because when you have land, but you cannot exploit it because the law does not allow you to do so, then you need to know how much you can exploit or what you can exploit. The same happens with the residues, right? Regardless if they are exclusively derived from production, it is important to consider dumping. Because if exploitation or reuse, or clean production from what we have is not done, then dumping, leachates, and waste are going to affect… All these residues are going to cause an impact on the hydric resources and soil. Therefore, one of our targets regarding work within this sector is precisely that the producers could develop their role and functions in a cleaner but also easier way. That their production does not become more difficult, without negatively affecting the resources. In other words, our main goal is the preservation, maintenance of the different resources we have. And it is important that we also focus on how they dispose of liquid residues, for instance, which is very important since in the rural area, for example, there is no sewerage system. And also, the topic regarding water concession, how they make use of the surface water, and how they dump them. Thus, from the Corporation, we also constitute the chain. In other words, the production or water use chain. If we have the water use in front of us, then, what is the before, the during, and the after so that there is not a total impact. Thus, then, there is the issue of septic processes. Well, we do that support. In some rural units, pits are provided, and they are also accompanied for the permits they must have.

**Short question. When you say that in some rural communities they are supplied with pits, is it a CARTER project with institutions? Or with communities?**

They are CARDER projects. However, there are also other institutions that also do it, as support to some rural units that need it. So, sometimes we supply for a project according to the financial capacity that we have at the time. And the government, the secretaries that they have, also support this type of [15:54].

**The next question is, which are the challenges in that context you are explaining now? For instance, the limitations that you find.**

I think it is sustainable development, since it is not… Although we constantly work on that, and we still have some gaps, cultural issues are important as sometimes farmers do not know them. But besides knowing the technicians, or having the information, it is the culture. I mean, many communities still keep or have that culture that is not yet rooted to certain topics. More likely to resource exploitation than preservation. Although that has been changing a lot, there are still some gaps in that knowledge. But I think here it is more about sustainable development regarding economical aspects of the producers. How do I use the resource, but I do not finish it to be able to eat, to make a living? Right? Let’s say that the economic sources of all the producer end up being all their property. An example, they can change the use of the land, the product because avocado produces more than coffee. I mean, without thinking that the avocado is going to damage the soil in short-term compared to another crop. Therefore, sustainability issues, economic development too, but environmental sustainability ends up being that difficulty, that challenge in which we have to work on, right? Issues regarding long-term preservation, but without influencing the economy or production.

**Within the same question, or idea, which would be the improvements or proposals for improvement?**

Low-cost technologies. I believe there we could… In fact, I consider this study to be very interesting since it would be an alternative to carry out in accordance with the development of the Department, following the social characteristics. Because sometimes, if we bring technologies from other countries, from other places that do not match with our culture, out geography, and all the social characteristics we have. Therefore, the possibility of having technologies that can adapt to all those local properties, that have easy access for the producers, would be nice. It could be one of the possible scenarios. And besides the technology, we can reach a clean production, in addition to generating economic resources, then it would be a viable option to provide with that sustainable development we were talking about.

**You already mentioned the word that relates to something important that you do. This drives to the topic of sustainability. There is a question divided in two aspects and refers to the challenges in terms of sustainability. You already mentioned the economic challenge, which is important, but those challenges, as you mention them, relevant, such as crop migration… Is there somehow a connection between farmers and CARDEL? Basically, regarding crop migration. What could it happen? What are the challenges in terms of sustainability for the producers and CARDEL in this context?**

I think that we are missing, or we should have a little bit more of connectionregarding function and land management, which would be the use of the soil. We have been working on this topic in diverse research. Indeed, also from the climate change perspective, which are the optimal areas for specific types of cultivars. We are still incipient, still starting in this process of knowing a bit more about the changes of climate, how crops are and how they adapt to the changes we are already experiencing. However, in other areas that the corporation works with, there is advising about which are the best crops for soil preservation. There we think that the biggest gap is between the preservation and economics since we, from the corporation, make an effort in terms of guiding, research, education, showing the producers which are the best alternatives to reach that environmental sustainability. But, nevertheless, economics continues to prevail in some parts. Therefore, when a big project starts, they rent the land, and it is difficult to fight against that from here. Beyond that guiding and accompaniment we can offer, the producer is the owner of his land, and he often ends up changing the use. We will obviously worry from here that there is no impact and that the resources have to comply with regulations. As long as the regulations are complied with because the producer can implement different crops, but the economics continues to be a relevant factor in terms of that sustainability.

**What projects does CARDEL currently have that are related to improving this sustainability?**

Well, from different areas. But I would like to leave the question to María Emilia when you interview her because there, I do not have much information about the different projects. Therefore, I do not want to mess that up.

**Of these same projects, do you have knowledge of previous projects or experiences that they have had in waste management or related?**

Let's see, yes. They have worked, but not with coffee. Not with the two crops specifically that you mention, but, for example, one of the ones that I am talking about right now is the issue with Asocaña Ingenios , which does have several processes. There is another process that takes place, I think, in Celia, which is related to the porcine topic. They have some energy with the biodigesters. I do not know if the efficient stoves are included there. We do have an efficient stove project that is implemented throughout the Department. Well, I say this because there they burn part of the waste that they have in production, or they also plant wood orchards to burn, so what it does is that it also helps with energy efficiency. As for the food in many rural communities. But specifically in these two crops I have no knowledge.

**What challenges and opportunities do you identify with this waste utilization project? Challenges and opportunities.**

The challenge is knowing how to reach the population. I think that language is important, it is important to make them understand all the benefits that a change in the production process can have because I told you a while ago, our cultural issue is sometimes very deep-rooted. So, it is difficult to be able to change certain practices that have been developing for many years. Therefore, there is a big challenge there, which is to be able to change the way in which many of the producers have been working.

About benefits, well, all because the process as you are presenting it to us, would obviously lead to less adaptation in terms of water, water resources, soil resources. It would also be a benefit for the producers if they are going to have some use of the by-products that are obtained from these residues. And I think that also, in economic terms, it would also be a benefit for them because if they, in some way, minimal, but they can benefit from something, with an additional income that they can get from something for a different production, well then, it will also be a benefit for them. An in addition, institutional because then for us, let's also say that it would lower the pressure a little in terms of control because they would be developing a process that is better.

**In this part, I am going to expand this infographic a little more. What BioHub is looking for is to have that win-win where different entities are linked, such as communities, and the institutional part where the manipulation or management of this waste will generate income for the producers and will improve the chain, which they mentioned as a value chain. To take a different look at this entire process, taking advantage of and improving processes such as water treatment, land use, waste disposal, and their transformation. Now, having said that, currently, what prejudices or what impact or challenges do you think there may be in a new value chain, in the region? That is, in a process like this, what challenges and what prejudices would it present? And what benefits?**

Well, I think that there, in terms of prejudice, if it increases the work of the producer. If it becomes more difficult for them, this generates more work, more time than what they are currently spending, without having sufficient compensation for that increase in working time, or in the labor that they have to invest in it. But sometimes one finds rejection towards new technologies or new processes when they do not understand them very well or do not see the cost-benefit. In other words, if there is that... If the improvement that is going to have or the social, environmental, economic benefits that the process is going to have are clear, then surely the change is going to be achieved. Now, also the issue of continuity. The issue of continuity is important because sometimes it has happened, and I think we have also missed many opportunities. It is that we manage a project, we hope that the community will empower the project and give it continuity and make it sustainable. In other words, over time, I mean, that it has continuity and works on its own without the support of the institution. But sometimes both we and the communities act in a paternalistic way. Then, I will explain to this lady what paternalism is. It means that without us, it is likely to not work. In other words, if the institution leaves, they will not be able to function on their own. So, we are always going to have to be there giving them supplies, financial support, or technical support. Therefore, the important thing is that they empower themselves. That it would be a project that is seen more from the community itself than from the institutional framework, to be able to make this issue work in the long term and not be a short time during the institutional accompaniment, and that's it. That has happened to us repeatedly, that we have come across that dispute. Hence, it is a challenge. It is precisely that, to achieve the empowerment of the populations in this type of project.

**Would CARDEL play a significant role in a new value chain?**

Of course. Indeed, you asked me at the beginning what is our competence, our ultimate goal, and it is precisely the conservation of resources. And if a project like this is going to reduce the impact on several resources, then obviously for us, it is a favorable project. In addition, because the producers are also going to benefit without us being there all the time controlling, but they are going to have a production that is not going to have as much control if it is a clean process. I think the foundation would be willing to collaborate.

**What role or how do you identify the role that CARDEL would play and where in this value chain?**

I would believe that depending on how it is proposed, we could support land use planning issues. We could somehow get to finance part of the project depending on how it is presented, and if necessary, then also the goals that we have in our action plan, and on some occasions, we could be operational, we could support in terms of function for the management of resources. Initially, for the project we can do that management and the same technical assistance that has always been present in our functions because they will continue, they can be a fundamental part of the project in terms of connection because it is not the same to work with a single producer than working with several of them. It would look like a big umbrella, and we can say: “Well, we are all going to work together” or “This is something that is going to benefit a municipality or a percentage of the Department”. Therefore, I think that there we can be that entity that connects, that can show the benefits to the producers.

**This question is complex. Why is a project like this important? And why is it important for CARDEL to participate in a project like this?**

For all the benefits it brings, for the producers, for the Department itself, and for the institution. For the producers, if it is going to generate income, it is going to be beneficial for them because it is also going to be used. What is waste today, it will generate income. Somehow, it will be an additional income that they do not have today. So, it seems to me that it ends up being beneficial for them. For the corporation because we are going to have culturally different clean processes that are going to contribute to our Department goals. For example, in terms of emissions, in terms of water conservation, due to less contamination of water resources. Well, we are going to have a beneficial contribution in terms of conservation. They were the producers, the institution, and?

**Why is a project like this important? And why is it important for CARDEL to participate?**

What I had already told you, but it is important that the corporation participates because it is within our goals, it is within the different proposals that we have in our action plan, as it is precisely the opportunity to support the producers so that they create better processes, with a lower impact.

**The next one is about obstacles. What prevents CARDEL from carrying out or participating in projects like this?**

I think we do not have an impediment, but we would have a limitation in terms of time. In other words, participation, we don't have any... I am not saying that we cannot be there, unless the regulations, or that there is something in the project that the regulations take us out of as actors in the project, but what I told you is that now it is about having a limit of participation. I mean, we would not be the ones who are going to sustain the project over time. Perhaps in the early stages. Because ideally, it would be the producers, who are the ones who are directly benefited, who give continuity to this type of process. So, our participation will also be biased in terms of competition, goals, available resources because we cannot say, “Oh no, the project is wonderful, we are going to finance it”, no. In other words, we would have to look at our direct competencies and the resources available to be able to contribute in some of the phases of the project.

**In the case of a new value chain like this one, what could threaten, damage, or affect the existence of value chains like these?**

Well, I would think that we can start thinking again in economic terms. If the producer does not see a benefit for his production or in social terms, they can abandon the project. That may be part of it. Also, political decision. When we refer to political decision, the leaders of the institutions, the legal representatives, governor, mayors. If it is not a project that looks strong, that looks solid and that can be supported, then they can decide not to participate. Thus, that may also be one of the difficulties you may have about it. In other words, it depends on the strength it has, like the rest of the base, so clear, so solid, and so bearable over time that it really interests the actors involved. Then there may be a lack of interest from those actors, or simply abandon the project in some phases because it does not have or is not there that technical, or economic support, or that it expires over time.

**At this point, we are going to give you these two grids, where there is a relationship of power and interest, in two sectors, which are coffee and cocoa, and where some actors are represented. There is academy, the producers, some entities, Fedecacao, the Coffee Growers Committee, Biorefineries would refer to this, technology providers, cooperatives, maritime industry because part of the results is the production of fuels for the industry, transport, storage, biomass collectors already taking into account an established value chain scheme. The part of regional government. They present, in this grid, how it is. The first question in these sectors, from CARDEL, which actors should be included in the value chain? I mean, what should be included here that is missing?**

Let's see, municipal government, I imagine, right?

**Yes**

[She reads the actors quietly]

When we talk about coffee growers, we are talking about producers, right?

**Yes**.

I would think they are all included. We would be in the regional government, right?

**Yes**.

I would think that in a general way, they are all included. Well, obviously, this has some subdivisions. For example, in academia, it is not only universities, but also other training entities, such as SENA. And the municipality, there are the units that we were talking about now, the *matas*, the ICA, which are different local groups. NGOs, the non-governmental organizations, that there are some that can support this type of... I do not know if it also counts as community action, that can support this articulation of the producers. Who would buy the product?

**Shipping companies**

Well, as I see it, it is that the entire decision, guidelines, and guidelines for production, who is going to do the production, who would technically guide production. You transport, you store, but there is someone who buys, right? It is like the whole process before is present, but the actor who benefits from the final product, who really ends up being the most important, is missing. Because I can produce very cool things, very pretty, but if no one buys them from me, they are useless. So, really the ultimate beneficiary I think would make it easy. It is that.

**In this same grid, what do you think about the positions? Are they where they should be, or are there some that should be moved? How would you move these elements within the grid?**

They would be in high interest, low power.

**Yes.**

They should move. At least these, who are the producers, should have high power and high interest because they are really the ones who have to make decisions. Academy would be right.

**[Second interviewer, in English] Then, associations should be below high interest in these kinds of projects. This is the power, but my question would be, do they have high interest and high power? Or just high power?**

**[First interviewer, in English] She said more, in the cocoa and in the coffee. She thinks that.**

In this part, there are those that transport and store the biomass, that is, the raw material. It is not as such the one who buys.

Well, that would be fine. These should have more interest, although they are well located. But as it should be, it is with more interest. If I make myself understood. We should work for them to come here, but we would have to work for it.

**[Second interviewer, in English] More interest, is what she said?**

**[First interviewer, in English] Yes, but the commitment has to get more because it has a good position.**

Currently, yes, but we should work so that in the future it will be of greater interest.

**Where would CARDEL be located on this grid?**

I would think that CARDEL would be around here because we have... Let's say we have some power, not so high. It would be like middle power, I would say, but with high interest. Then we could be around here. So, we would have high interest, but power, but not so much.

**[First interviewer translates the answer into English to the second interviewer]**

**With these actors here, with whom does CARDEL currently collaborate or interact? And what is the relationship?**

With the national government, we apply the policies and guidelines that they provide us. We also receive guidance from them in projects that we have. With the regional government because even though we are here, we interact directly in agreements, in processes, in projects. So, together, we develop different actions and different processes in the different departments. With the municipalities, we advise them, we always go... Let's say that here we can be like a two-way scale. Because here from the national government we receive, but we also give. We do not make decisions, but we do say that we provide information for decision-making. In other words, we tell at the national level, what we do, what we do for, what are the problems we have, so that decision-making is also in accordance with what the regions need. So, let's say that here are two directions. And in terms of municipality, we are also that bridge, since we take a lot from the national to the municipal, which is up to the territories, but then we also do all the accompaniment, advice. We have the principle of subsidiarity, which is always together with the accompaniment and support at the municipal level in projects, in orientation, in accompaniment, and obviously in terms of compliance with regulations. We are always there keeping an eye on it. Communication platforms? I do not know what platforms, but...

**A type of cluster or group of associations or producers who are interested in waste use processes. Specifically, communication platforms. This group of people or this group of interests.**

I do not know; I do not know them.

**[Second interviewer, in English] I don't know if these kinds of platforms exist here, I don't think so. If it's there, put it in, but if it's not, leave it.**

**That he is not very sure that this type of association exists, of a group of people here.**

No, I don't think clusters exist. I do not think so. But we work with associations. Whether or not they are interested in the decision, as we do not have the product as such yet, it is very nascent. I do not know what specific projects there are, but I do know that there are some, but they are not massive, that is, it is not something that is had in quantity. I do not think it is an association, an organization that is currently marketing, or that requires […]

Maritime jurisdiction we have none. None. Well, maybe in the valley we already have a way out... There may be a chain that we do not know about, that can be explored, but no, it does not exist.

Cooperative, yes. We work with cooperatives, with all producer cooperatives. Same, advice, guidance, the whole issue with projects.

Technology providers. No, unless we require it, or they are within the specific project. For example, right now, we have a royalty process for weather stations, for early warning purposes. So, obviously, we have to look for a supplier of this type of technology, which we do not have. When we need to buy it, or we need it for specific projects.

Biorefineries. No. What we have now that is most similar is our relationship with *Ingeniero de Aralda*, but beyond that... [55:00]

Senicafé, coffee growers, good relationship. Sometimes, we make agreements, we develop joint actions that apply the goals of each one. They also have an operational plan; we have our action plan. So, as long as actions that meet the goals of the different institutions are generated, or the different federations. Information transfer is very important. For example, from Senicafé, we benefit or have that relationship in terms of monitoring data that they carry out because they have less... We do not have a network of stations, for example, but they do. They monitor, we do not. We support other entities such as the Technological University with the climatological network. Therefore, that kind of relationship is information transfer.

With the coffee growers, well, the same, we offer advice.

With the academy, a lot. Well, the UTP, the Pereira Technological University, is strong here. The other universities also have some relationship, but it has not been as strong. On the environmental perspective, it is the Technological University, although we also have other processes, such as the Coffee Cultural Landscape with the Catholic one because we have different processes, also research ones. Indeed, we have had some specific processes that the universities could develop.

No... with them, we do not have. Since we do not produce, we have no relationship.

**[Interviewers talking about the answers]**

**What regulations would apply to this type of project? What specific regulations would apply to producers? Let's talk about biomass, not cocoa or coffee residues as such, but residues. What would be those norms to develop the project?**

Well, we are not making any use of any resource... I do not know. We would have to investigate a little what the impact of the project may be to know what regulations to apply. But more than that, I think that, in terms of regulations, it is more to boost or promote the project because there are some in which we are forced to support the producers, than the restrictive ones. Unless we have, but we would have to look very specifically at what the impacts of the entire process would be to know which standard applies. But I think that, well, there, to be a little cautious, I think that we would have to create a regulation to investigate very well what can be affected.

**[Interviewers talking about the answers]**

**There are three questions. The first, in the department of Risaralda, what residues are seen more in the agricultural sector? Which ones have the biggest volume? Second, why is nothing being done, or why is there no project in that area? The third, I am going to postpone it.**

There are two, well, that we have many complaints about the rural issue, it is the bag of bananas. We have always had many problems with the topic related to banana bags because the producers collect them and, like that, they contain chemicals, although I do not know the name at this time. Well, then they pile them up and collect them in certain areas, and since there is not much periodicity in the collection of those who pick up this type of waste, then they burn them. There is a lot of waste burning in the rural area. So, since they are far away, everything that is chemical containers, fertilizers, pesticides, all these types of substances have to have a special collection. And as far as I know, this collection is not very regular that collection of waste. The companies that do it, also make it difficult, or sometimes they say: "You have to take it up to a certain point", and then producers say: "I am not going to take that up there." So, they end up being a problem in the area. There is an issue of this type of waste, since it is special waste that cannot be disposed of in this way, and it ends up being worse because it is burned.

**[First interviewer translates the answer into English to the second interviewer]**

**This question is difficult. Do they have policies on the use of fertilizers or pesticides specifically? Because these fall to the soils, and somehow affect them. So, do they have any regulation on usage? If they can use a specific amount of product, and some control of them?**

There are regulations, but not for quantity. As far as I know, not for the amount, but for the residue. So, not so much for dumping, or effects that may occur after application. But there are referring to the whole issue of packaging waste, of bags. Regarding all this, there are regulations. That is why it is a specific company that must collect this waste. In other words, yes, there is a Colombian regulation that regulates the final disposal of this type of waste, but in terms of application, you can apply a certain percentage to your banana or coffee bush, no, because it depends on the need that your crop has. Well, I do not know much about it, but as far as I know, no. That specificity of how much is the maximum amount... In addition, it would be very difficult to regulate it. In other words, you would have to be there with the producer “let's see, show me how much you are applying”. I mean, it's very complex. Nor in terms of the sale of goods because there are those who buy according to the amount of production they have, so there are some that have fewer hectares than others, but it would be very difficult to reach them. Until now, it has been difficult for us to control residue issues. We as a corporation have to be aware that this waste is not deposited anywhere, but what the regulations say is that whoever produces it, and really, all the companies that produce it and sell it this type of waste, should also be responsible for the collection. So, it is hard to reach that specific point in which you say you can only apply this.

**[Short translation of the answer into English to second interviewer 2 and further questions first in English, and then translated into Spanish to get the answer]**

**There are some coffee plantations that deforest to have their crops, that is, free exposure. This affects climate change. Doing this type of activity has a direct impact on the climate.**

Of course, here we have microclimates. Well, here something very particular happened regarding coffee, I do not know if you know it, but at one time, I do not know what year, when the Coffee Growers Committee began to advise the producers, they told them to have free exposure because there was going to be a greater production, and everyone removed what was there and started... Right now, we are returning, again, well, shadowy, as it has other species as an accompaniment. In fact, there are already other farms that have higher production precisely because of the shade issue. One is that the trees generate a microclimate, since obviously there is going to be a big difference, and the other is that the tendency that we have in the Department is that there is going to be an increase in temperature. We are having an increase in temperature, and then, obviously, having trees helps to regulate a little the impact that has been having with the crops. So, let's say that there is a direct impact when having it freely exposed. In addition, we have had super high temperatures, without having the El Niño phenomenon. But sometimes, in the neutral season, we have had days of... On those days, at night, we have a season where we have reached temperatures of 35 °C. Therefore, we have had moments in which one. [ ]. So, during the El Niño phenomenon, it is much more, and if we can somehow have alternatives that can protect the crops, it would obviously be beneficial.

**[Short translation of the answer into English to the second interviewer]**

[Here, the first interviewer, who translates into Spanish, explains that in Colombia they have two different moments, *Fenómeno del niño* and *Fenómeno de la niña*. Niño is bright and sunny and niña is wet and raining, but without the change in the micro weather, it just gets 35 degrees in the day, such as the last month. And it is not normal.]

**[Second interviewer, in English] Two more questions.**

Another difficult one?

**Already the last ones. Do you have any type of monitoring for the issue of gases?**

We have... The country is currently in the Third National Communication on climate change. In other words, the communications that the country issues to the United Nations and show how the country has been behaving in different aspects. Vulnerability, emissions... And it shows in terms of the changes that they have been making in adaptation and research. Right now, we are in that third communication. The fourth is being developed. This third communication produces a result that is the country's inventory of greenhouse gases and has produced various methodologies. That inventory of greenhouse gases was given to us by departments. For Risaralda, well, when we do the analysis for the Department, then we have that Risaralda is the second dimension of the productive sector that emits the most greenhouse gases. In other words, we have transportation. The productive sector, but not as much the productive sector as all. It may be the change of soil. Therefore, all the soil change is included in the agricultural sector because what we are saying there is that we are deforesting to plant crops. So, in addition to the cows, the entire livestock issue, everything, they include the entire productive issue. Thus, due to the change and use of land, Risaralda is the second sector with the highest emission of greenhouse gases. In Pereira, also with a methodology from the ministry, an inventory of greenhouse gases was made, but here we go. In other words, of the fourteen because in Risaralda we have fourteen municipalities, Pereira capital, there is only Pereira, which has created the inventory. We still do not have an inventory for the rest of the municipalities, so we only have the data that the ministry gives us for the Department. I mean, we could say that, on a more global scale, and that we could at some point update it more with local data, but we are barely in that process.

**Is the first sector transport?**

Transport, [Apolu] and still Energy, I think.

**What are the biggest challenges in the coffee sector in terms of the environment? Environmental challenges in the coffee sector.**

What do you think is the biggest challenge? I think I would be...

**[Second interviewer] Also, environmental challenges in the coffee sector because they are included in the department**

**And if you have any study on it.**

Let's see, the term of continuing to be the coffee grower. We are coffee growers. We are Risaralda, Quindío, Caldas, Valle and Tolima, right? That coffee chain. But precisely, due to climate change, due to increased temperatures, crops have been rising in scale. So, not changing because there has been a transition. Now it is named in a very general way, but some producers have changed from coffee to avocado. For example, right now, in the Department. Therefore, sustain us as coffee producers, and let the production continue. From my field of work, climate change has been changing production a lot. So, it has been changed to a thermal floor, and they have been disappearing, or flowering, production has been changing in terms of season. So, sustaining, cultivating, ends up being difficult. And another that has nothing to do with the environment, but with labor, is that many producers complain that it is difficult to get workers for the harvest. Hence, in some way, it also ends up affecting because there are few in the production chain. But basically, in the environmental area, it is the issue of sustainability, and of clean production, obviously, of having a production... I think that the approach is well-thought-out because it is the residue, beyond the before, it is the residue left by production. And I think they are like two... Sustaining with this whole issue of climate variability and with all the changes that have been taking place.

**If they need any additional information, can they contact you?**

Of course. From my number, of course.

**Thank you very much.**

With pleasure

**Is your email?**

jmontoyaguaril@gmail.com / 316 223 62 47

And my name, Juliana.

**Many thanks. The last thing is to remember that there will be a talk at the end of the month, you will be invited, and you will be told a little about what has been done at this time. Then, we will send you the invitation. The participation of these spaces, and therefore remind you that, with this, the information is going to be used for the elaboration of this entire project. And finally, what I had not shown you was this. So, there is some waste there, a refinery. This is crude oil, which they want to use, and coal, which are the main one for energy production, where it will be possible to make fuel for airplanes and ships. And this other type of elements.**

Cool**.**

**That is what we are looking for.**

Cool. Super. Well, there we would have to take into account how much the cost of the project is, like the entire project, with all its characteristics, to be clear about what the investment is going to be like, or who, when, and how.

**[First interviewer translates the answer into English to the second interviewer]**

**Assuming it is a high investment because it is. Do you think the government and entities could support it? What is your opinion? Very honest opinion. Even if you think it will never happen here, you can be super honest and say so.**

It is difficult because government entities do not have much budget. But we could have a counterpart and financing could be sought with international donors or other donors. Because right now, there are several alternative sources of financing, but for it to be financed by local government entities, I do not see it as viable because the budget of local entities is really little for everything they have to do already. In other words, they already have to comply with a thousand things. So, focusing on a project like this will surely not have enough resources. They could contribute a part to participate in a call or have access to the product.

For specific projects, excuse me for not having all the information, but it is not my area. But my colleagues will surely tell you a little more about what is done with producers.

**[First interviewer translates the answer into English to the second interviewer]**

**For anything, can we contact you?**

Of course, with the greatest pleasure.

**Thanks.**

To you.