

Jeff Franklin:

Hello and welcome to this edition of the Community and University podcast. I'm your host, Jeff Franklin. Today I'm joined by Dr. Mahmoudi. Dr. Mahmoudi is an assistant professor for the Michigan State University School of Packaging. Her co-learning plan for this project year addresses food waste and accessibility, specifically related to supply chain management. How are you Dr. Mahmoudi?

Dr. Mahmoudi :

Thank you very much. I'm well, I'm doing well. How are you?

Jeff Franklin:

I'm great. Thank you for asking. So Dr. Mahmoudi, if you don't mind, can you share a little bit, like a brief overview, of what your project will cover?

Dr. Mahmoudi :

Absolutely. First thank you very much for inviting me to this podcast. So the whole idea of this project is to improve the accessibility of people in need to food in the whole state of Michigan. So as you know, currently, food banks in Michigan are struggling with distributing the food among people in need due to the current Novel Coronavirus outbreak. So the issue is that... There are several issues. We talked about this topic with food banks very recently. The first issue is that food banks generally rely on volunteer laborers. So the fear of the Coronavirus outbreak has caused that the number of volunteers is going to decrease, right? The other issue is that the schools are closed right now due to this issue. And so the food banks are going to have a struggle to distribute the food among public schools and they want to minimize the contact.

Dr. Mahmoudi :

So they have decided to distribute the food through home deliveries instead of general delivery of the food everyday through schools. And the last issue is that they want to minimize the contact. And they are thinking that how they reduce the frequency of deliveries, they have decided to put the food and fresh fruits and vegetables in boxes for 10 days for the students. And they reduce the frequency of this deliveries, but they want to do home deliveries in this case. So it's very, very critical to think about this supply chain and how we can improve the accessibility of people in need, especially for Michigan that we have the Upper Peninsula that is a very large and wide region and quite inaccessible because we only have one highway that connects the [lower peninsula of] Michigan to Upper Peninsula.

Dr. Mahmoudi :

So it's very important to think about it. And the whole idea of this project is that we would like to create a kind of analytical framework to coordinate different actors of the supply chain. So if you would like to know more about the actors of the supply chain, the first actor is food donors. Food donors can be USDA, United States department of agriculture, or can be a farm, can be a kitchen, or can be a major retailer, such as Walmart, Kroger, Target. And then food donors call that they have food and the food banks can send their own trucks to pick up the food from their warehouses, or sometimes they send it directly to the food banks' warehouses. And then when [food banks] receive the food, they have to very quickly decided about the quality of the food if it is acceptable or not. Because most of the time when the food is sent through by major retailers, they are close to their expiration date. So some that's why it's very critical to decide fast. They have to send it to the composting center or they have to send it to their clients or people in need. Sometimes in-between they send the food to food recovery agencies.

Food recovery agencies can be kitchens and community kitchens or it can be pantries or churches. So they will disseminate and distribute the food among people. It's very, very important to coordinate different sectors considering different constraints that they have in their supply chain. The first constraints that they have is about monetary budget. They have specific money and funds and they have to assign for their pay to staff and for their own facility, storage trucks and truck drivers, and everything.

Dr. Mahmoudi :

The second constraints that they have is about time. Time is very critical and once they receive the food, they have to decide it fast because the food is going to be spoiled very fast. Some of the foods are fresh fruits or fresh vegetables. The third constraint is about environmental constraints when the weather is quite, you know, cold or the humidity is high, the food is going to be spoiling very fast. So it affects the quality of food a lot. And the last constraint is about societal constraints. We have a specific population in Michigan that, for example, having a specific preferred food or diet and they do not use a specific food, for example, meat or something like that. So we have to decide where to send the food so that it would be usable for the people. These are the constraints that we have to consider in our model such that we, you know, make the food more and more accessible to people. If you would like, I can talk about the motivation of this project further.

Jeff Franklin:

Yeah, you could do that for sure. I wanted to first ask you, you mentioned that a lot of your project relies on kind of communication with food banks and because of the Coronavirus, food banks are worried about volunteer accessibility or availability. Have they given you any ideas as to how community members can still help them out right now, given the constraints of the virus, is there anything that people can still do to volunteer for these food banks or is it just kind of a waiting game?

Dr. Mahmoudi :

Yeah, so as you may know, we have seven food banks in Michigan. Some of them, for example, the one that we had in Grand Rapids, serve more than 40 out of 80 counties of Michigan. And they really wanted to minimize the contact, and they really want to have a kind of safe situation for this specific problem. So they rely on the volunteers with specific conditions and they have their own restrictions and regulations, but they are worried that most of the retired population, people that has been retired recently, they are volunteers for these food banks and they really want to involve them as long as they do not have any specific, you know, issue about this case. So they are really willing to get help from the people.

Jeff Franklin:

So you mentioned you wanted to talk about your motivations for this project. We would absolutely love to hear about them. What got you started on this sort of line of thinking?

Dr. Mahmoudi :

So the motivation of this project, it started even before the case of Coronavirus outbreak. So, we were thinking about the food based issue. So as you may know, more than 40% of the food is wasted every year in the United States. While, for example, one in seven Americans in the state of Michigan still struggle to put enough food on the table. And it's a huge number, I think. And apart from this specific issue, the resource cost is huge. For example, about 20% of greenhouse gases from meat production. So if you waste the meat, it's a huge cost of resources. Or for example, it takes over 10 gallons of water to

produce a single slice of bread. So it's very critical to think about how we can minimize food waste, use the excess food that we receive from major retailers and fight hunger. So it wasn't some sort of coincidence that we faced novel Coronavirus outbreak. And we faced another issue about accessibility of people needing food banks that that forced us to focus more and more on this particular supply chain system. So that's the case.

Jeff Franklin:

What are the end goals of the project? Like what do you hope to achieve?

Dr. Mahmoudi :

So the goal is that we would like to address the issues that exist in food banks. One of the issues in food banks of the state of Michigan is that is about their own network design. So they generally, they have not been distributed perfectly. So we are thinking about how we can improve the coordination of different sectors of food banks and food recovery agencies. This is the first goal. The second goal is that they are really willing to know how to improve their home deliveries. In the case that they have some food, but they have lots of clients distributed in a city and they would like to know how they dispatch their trucks and how to ask their drivers to make these routes possible. So in that case, we are going to develop, in the second phase of this research, we would like to develop a kind of software prototype for them to help them to route and schedule their trucks for such a unique and specific circumstance for home deliveries and distribution of the food.

Jeff Franklin:

Had the novel Coronavirus never happened? How would your project have changed or not changed? What is changing now because of the virus that you wouldn't have maybe looked at had the virus never happened?

Dr. Mahmoudi :

So that's a very clever and good question. Before the coronavirus happened they distributed the food among schools so it was much easier for them to deliver the food to a specific hub and then they disseminate it, distributed the food among the students who rely on this food. But right now it's more critical because it's home delivery, delivery one by one family and it's very, it's going to get... This project is going to be more and more important because they want to see how they can utilize their limited resources. Their drivers that are working voluntarily need to be safe. So they have very limited resources and tighter resources, but they need more delivery, more I mean home deliveries in this case. Before that they have just some seniors or some people that do not have access to come to their warehouses to get the food, but right now they have to drive up to deliver the food. So that's the big question.

Jeff Franklin:

Thank you. I think that's all I have for ya. Do you have any other things you would like to talk about?

Dr. Mahmoudi :

No, I'm just willing that our team at MSU could help them to improve their system as much as possible due to the current circumstance that has happened for the whole United States, especially for Michigan that have, you know, populations that need this.

Jeff Franklin:

Awesome. I don't disagree. Thank you so much Dr. Mahmoudi for joining us on the Community and University podcast. Once again, I'm Jeff Franklin and I just wanted to remind everyone that as of right now, the innovate Michigan summit will still be happening on September 3rd of this year. So you can register for that on the REIcenter.org website and get all the information that you might need about that summit. Dr. Mahmoudi will be presenting there as well as a host of other inventors and other speakers about projects and co-learning plans and innovation fellows and other cool stuff. So we hope to see you there. And once again, thank you so much, Dr. Mahmoudi. I hope you enjoyed your time on the show.

Dr. Mahmoudi :

You too. Thank you.