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Chair

Mr. Pat Finnigan

Standing Committee on Agriculture and Agri-Food

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● (1530)

[*Translation*]

The Chair (Mr. Pat Finnigan (Miramichi—Grand Lake, Lib.)): Welcome. We are continuing our study on climate change and water and soil conservation issues.

This morning, we welcome two representatives from the Department of Agriculture and Agri-Food, Dr. Brian Gray, Assistant Deputy Minister, Science and Technology Branch, and Mr. Tom Rosser, Assistant Deputy Minister, Strategic Policy Branch.

You each have 10 minutes for your presentations.

Mr. Gray, you have the floor.

Dr. Brian Gray (Assistant Deputy Minister, Science and Technology Branch, Department of Agriculture and Agri-Food): Thank you. My name is Brian Gray, and I am the Assistant Deputy Minister of the Science and Technology Branch at the Department of Agriculture and Agri-Food.

On page 2 of the document you were given, you will find an outline of today's presentation. I am going to discuss the role and priorities of Agriculture and Agri-Food Canada, and then I will present an overview of climate change and its impacts on agriculture. Finally, I will provide examples of scientific activities conducted by Agriculture and Agri-Food Canada to achieve greater resiliency of the agricultural sector to the effects of climate change.

[*English*]

Our vision for our department is to drive innovation and ingenuity to build a world-leading agriculture and food economy for the benefit of all Canadians. Our mission is to provide leadership in the growth and development of a competitive, innovative, and sustainable agriculture and agrifood sector.

The science and technology branch, which I am responsible for, conducts agricultural research development and knowledge and technology transfer activities to support a competitive, innovative, and sustainable Canadian agriculture and agrifood sector.

I have pulled out what I feel are the most important points in our minister's mandate letter related to the topic that you are studying right now, as it relates to my branch, the science and technology branch. First, I point out that the key point is to invest in agricultural research to support discovery science and innovation in the sector. Second is to work with provinces, territories, and other willing partners to help the sector adjust to climate change and better address water and soil conservation and development issues. Finally, we need to support the ministers of Natural Resources and of Environment and Climate Change in making investments that will make our resource sectors world leaders in the use and development of clean and sustainable technology and processes.

[*Translation*]

Let's move on to slide 5. Our branch has 20 research and development centres located across Canada. We have 35 experimental farms that are connected to the research centres. We have three regions: the coastal region, the Prairie region and the Ontario and Quebec region.

[*English*]

I will provide a quick overview of climate change impacts on agriculture. Climate change will bring, quite simply, longer growing seasons, due to temperature, but also more variable precipitation, resulting in more drought and also in more flooding. We'll see more extreme events. Warmer temperatures will produce more pests and disease outbreaks, and make Canada more vulnerable to invasive alien species. These are invasive species that might not have the suitable conditions to live in Canada yet, but that, with the changing climate, will. Finally, land suitability for spring-seeded small grain crops will increase, particularly in western Alberta and northeastern British Columbia. In summary, I would say that with the changing climate, we have challenges as well as opportunities in agriculture.

Globally, agriculture represents between 10% and 15% of the total anthropogenic—that is, caused by human activity—greenhouse gas emissions. In Canada, it's approximately 10% of our total greenhouse gas emissions.

In addition to our own research, which I'll be talking about briefly today, we also have our department's agricultural greenhouse gases program, which provides $27 million over five years to Canadian universities and non-profit organizations for the research, development, and technology transfer of ways to reduce net greenhouse gas emissions from Canada's agricultural sector.

● (1535)

[*Translation*]

Let's move on to slide 9, which outlines agricultural drivers and challenges related to climate change.

There are two key points. The first involves adapting agricultural production to climate change while being involved in its mitigation. This implies adaptation to abiotic and biotic stresses; reducing greenhouse gas emissions; and supporting the development and use of clean technologies contributing to long-term, low carbon economic growth.

The second key point consists in conserving environmental resources and services while increasing agricultural production. The increasing world population stimulates demand for more food. Here we are talking about soil conservation, water and biodiversity in agricultural landscapes, and sustainable intensification.

I will now provide a few examples of AAFC scientific activities. This is slide 10.

[*English*]

Moving on to page 11, here is one example of a collection of science. When we talk about beneficial management practices, one of the stellar examples is moving to no-till. I understand the Soil Conservation Council was here Tuesday. They would have given you quite an update on that. With that, in the west came the reduction of summer fallow. Over the period from 1951 to 2013, the net carbon sink or storage that we were able to achieve because of that change in practice, that beneficial management practice, was about 11 megatonnes of CO2 equivalent. This offsets about 15% of the agricultural GHG emissions.

The point I'd like to make is that it wasn't one or two studies. It was a series of hundreds of studies conducted over decades, not only by our department but by our partners, academia, the provinces, and our colleagues in other countries, most notably the U.S. and the USDA. Research very rarely leads from one study to a beneficial management practice. It takes a fair bit of time.

With the next couple of slides, I'd like to talk about extreme weather events.

In our branch we develop new varieties of crops. We develop new varieties of crops in areas where there is the public good space. That is, there's not an industry that's developing that variety, so it is something we do for the public good and for the benefit of our producers. An example is potatoes. At our Fredericton Research and Development Centre, we are developing varieties of drought tolerant potatoes. This is just a very quick illustration of how that's done. We're doing several crosses in the hope of eventually developing a variety that is more drought tolerant.

Next is an example of where we have too much water. In a changing climate, you'll see that we will have drought, but we'll also have periods of more intense rain. We've already seen that across Canada in the past growing season. Barley is a particular cereal that doesn't do well in inundation. Normal varieties that we have now can't last more than a couple of days being inundated with water. At the Brandon Research and Development Centre, we are developing inundation tolerant barley. On the right you can see the two varieties: the sensitive one, which is the more normal one, and the one that we're developing. It's kind of a neat project. We have mini rice fields at the research centre. We flood them and that variety on the left is now tolerant up to 10 days.

The final example I'll give you is from the agro-climate, geomatics and earth observations division within our branch. They develop tools that are available to farmers and the public. They look at current climate conditions and future projected conditions given to us by Environment and Climate Change Canada or other members of the IPCC.

If you look at the illustration of the maps, the current weather temperature conditions are on the left. If you look at the right, there's a change of 3°C. You can see that this change of heat will make it a lot more attractive for these three examples of pests. What do we do with that? This informs our scientists to develop new varieties of crops that would be resistant to these types of pests, to develop beneficial management practices that would help the system be more resilient to the pests, and finally to search out natural predators to these sorts of pests.

The next slide, I apologize, is a bit busy. It's a work in progress, as are the living laboratories. I will try to explain it very quickly.

● (1540)

It's an adaptive management approach with the goal of improved agro-environmental performance and sustainable intensification. It's the use of multidisciplinary teams of scientists working together with producers, designing and experimenting with new, potential beneficial management practices on real working farms. These beneficial management practices would be different than the suite we have now because we'd be looking for multiple benefits. Beneficial management practices not only help in climate change adaptation but also mitigation, biodiversity, and water and soil conservation and protection.

We've been working with the USDA in the United States, with their science division, which is comparable to ours. We had several workshops leading up to one in January. They're quite supportive on this approach and we're going to look at collaborating over the coming years.

[*Translation*]

At slide 16, entitled “Looking Ahead”, you can see that the Canadian government is investing in agricultural science inside and outside of AAFC. Improving partnerships is integral to our approach, be it with the provinces, the sector or academia, through the Canadian Agricultural Partnership, with other federal departments and agencies and with international organizations to leverage benefits for Canada.

AAFC is well positioned to collaborate across the agricultural science and innovation ecosystem to support the sector's resiliency to adapt to climate change and mitigate its effects.

[*English*]

Thanks. That's it for me. I'll turn it over to Tom.

The Chair: Can you do it in four or five minutes?

[*Translation*]

Mr. Tom Rosser (Assistant Deputy Minister, Strategic Policy Branch, Department of Agriculture and Agri-Food): Mr. Chair, I will try to go as quickly as possible.

[*English*]

I'll add a couple of thoughts to what my colleague has said.

The Chair: Take your time. We have lots of time.

Mr. Tom Rosser: Okay.

The Chair: We'll be generous today.

Mr. Tom Rosser: I appreciate it, and I will try not to abuse the generosity of the committee, Mr. Chair.

I just thought I could build on some of Brian's remarks.

The main vehicle that the department, in collaboration with provinces and territories, uses to advance the goals of the pan-Canadian framework is our agricultural policy framework, known as the CAP.

The committee will be aware that since 2003 these policy frameworks have been a vehicle for federal-provincial-territorial co-operation in the agricultural domain. The current framework, known as Growing Forward 2, will expire on March 31, 2018. It will be succeeded by the CAP, the Canadian agricultural partnership.

Mr. Chair, I think members of the committee will be aware that when federal-provincial-territorial ministers of agriculture met in St. John's, Newfoundland this summer, agreement in principle was reached on what's known as a multilateral framework agreement, which is the basis of the framework. We've taken that agreement in principle and have been working over the past several months to operationalize it to give it legal effect and also, underneath the multilateral framework, to negotiate bilateral agreements with each of the provinces and territories.

Federal-provincial-territorial ministers of agriculture have identified environmental sustainability and climate change as one of six CAP priorities. Building on the efforts of past policy frameworks, the Government of Canada, together with provinces and territories, will provide funding to help the sector grow sustainably by reducing agricultural greenhouse gas emissions; protecting the environment, including soil and water; and adapting to climate change.

Brian shared with you some examples of research that we have conducted within the department and will continue to conduct under CAP to advance those efforts. I'd just like to touch briefly on some of the programs that we have to try to give effect to that research and innovation and transfer some of the knowledge that's generated.

An important element of the CAP is what are known as the business risk management programs, or BRM programs. These are a suite of cost-shared programs that are intended to help farmers deal with risks, market risks or other risks, beyond their control. Under the Growing Forward 2 framework, we anticipate that total expenditures under that program for a five-year period will be in the range of about $6 billion.

I won't talk in detail to each of the programs within that suite, but I would like to just highlight a couple that I think are particularly relevant to the work of this committee with respect to climate change.

There is the AgriInsurance program, which is the largest. It represents about two-thirds of total expenditures under the BRM suite of programs. It's a crop insurance program that's actuarially sound and self-sustainable, meaning that the premiums collected are based on historical farmer losses and, therefore, that the program is well placed to continue to help farmers remain resilient in the face of extreme weather events.

Occasionally when disasters strike, and the sector incurs extraordinary costs to recover, the AgriRecovery framework can be applied to develop specific programming to help producers with these unforeseen extraordinary costs. An example of where this has been done is in Nova Scotia after an unusually heavy, “once in a hundred years” snowfall in the winter of 2014-15. AgriRecovery was used to help maple syrup producers recover from damages suffered during that winter. More recently, an AgriRecovery response is being implemented for damage caused by the wildfires in British Columbia this summer. Support is being made available to help with the extraordinary costs related to feed loss, livestock mortality, farm infrastructure loss, and other damages caused to farmers.

The only other program I'd like to highlight in the BRM suite are the AgriRisk initiatives, which support research development and the implementation of new risk management tools.

In addition to the BRM suite, the CAP will have a series of cost-shared programs that are usually delivered by provinces and territories but financially supported by the federal government. On farm environment cost-shared programs, it will deliver the practices and technologies developed through innovation programming that Brian described earlier. Provinces and territories design and manage delivery of these programs, and this allows programs to be tailored to each jurisdiction's environmental priorities. These programs build producer awareness and knowledge of environmental risks on their farms, and based on these risk assessments, provide financial incentives to producers to adopt innovative, beneficial management practices to reduce these risks, including climate risks.

● (1545)

Canadian producers have adopted technologies and practices that both build resilience to climate change and reduce GHG emissions by improving production efficiency and increasing agricultural soil carbon. In particular, there is a lot of interest in the sector now in precision agricultural technologies, for example, which, among other things, can allow producers to reduce and better target the use of fertilizers and other inputs, and improve the efficiency of their operations while reducing their climate and environmental footprint.

[*Translation*]

I will briefly discuss some measures that are complementary to the previously described Canadian Agricultural Partnership initiatives, to present the government's objectives to mitigate the effects of climate change on the agricultural sector.

In Budget 2017, an amount of $70 million was allocated over six years to further support agricultural discovery science and innovation, with a focus on addressing emerging priorities such as climate change and soil and water conservation. Budget 2017 also included an amount of $200 million over four years for innovative, clean technologies for Canada's natural resource sectors, including agriculture.

Agriculture-specific funding will address key barriers to the development and adoption of clean technology in the agriculture sector. For instance, the funding will serve to produce advanced materials and bioproducts based on agricultural outputs, and reducing greenhouse gas emissions in agricultural operations through improved land management and energy efficiency.

I know that the committee recently conducted a study on A Food Policy for Canada. The department has just completed a consultation process on that policy. The environment is one of the four themes of the food policy for Canada. During consultations, stakeholders across the country raised food waste and its associated greenhouse gas emissions as a priority for A Food Policy for Canada. We estimate that the value of food waste in Canada is approximately $30 billion a year. This represents 3% of greenhouse gas emissions across Canada.

Through the adoption of innovative practices and technologies, the agriculture sector has made important advances in increasing efficiencies, reducing greenhouse gas emissions, conserving soil and water, and building resilience to a changing climate.

The sector is proactively working to meet growing demands to demonstrate sustainability. For example, the Canadian Round Table for Sustainable Beef, the Canadian Round Table for Sustainable Crops and the Dairy Farmers of Canada proAction Initiative, are all working to advance the continuous improvement of the Canadian agricultural value chains, including in areas such as reducing greenhouse gas emissions.

Through CAP and other complementary funding, the federal government, in collaboration with provincial and territorial governments, will support industry efforts to enhance the sustainability of the Canadian agricultural sector.

● (1550)

The Chair: Thank you, Mr. Rosser.

You said that when food waste is disposed of or buried, greenhouse gases are released. Could you clarify that point?

Mr. Tom Rosser: That is correct. The methane produced by the waste is quite a major source of greenhouse gases.

The Chair: Thank you.

I'd like to welcome Ms. Karine Trudel and Ms. Salma Zahid.

We will begin our question period. Mr. Berthold, you have six minutes.

Mr. Luc Berthold (Mégantic—L'Érable, CPC): Thank you very much. That's very kind.

I thank both of you for being here today.

This study will involve a lot of discussion about greenhouse gases, carbon, the effects of climate change, and carbon taxes. In short, we are going to discuss many topics during our meetings for this study.

Mr. Gray, you raised a point that is quite clear in your document. There are a lot of questions being asked about how to face climate change and its effects on soil, and how farmers will react. You mentioned that there are opportunities, but that there are also challenges to be met. Temperature variations are among these challenges, and we are going to have to adapt crops to this new reality.

You spoke a lot about genetically modified products. What is the status of research on genetically modified products at Agriculture and Agri-Food Canada? Your document indicated that this is Canada's main response to climate change.

● (1555)

Dr. Brian Gray: Thank you for the question. I will have to answer it in English.

[*English*]

Mr. Luc Berthold: No problem.

Dr. Brian Gray: It's going to be hard enough in English.

I did not mention GMO in my presentation, but thank you for the question. The work we do in our breeding is not GMO as defined by most groups. I don't have the definition off the top of my head, but I can tell you what we do. In an organism, there is the genome, which is the entire sequence of the DNA. It's the entire genetic code of the organism, and what we've been able to do in the scientific community with our genomics people is to look for markers, meaning the genes or usually a series of base codes on the long strand of DNA marking an association with a trait that we're looking for. The trait could be resilience to drought or resilience to flooding or resilience to a fungus or whatever, and that trait, for whatever reason, is not expressed. There are ways of using viruses to express the DNA that's already in the naturally occurring plant. By doing that, we are able to express the gene that has been suppressed.

Generally I would consider GMO as something that takes DNA from a different type of organism and puts it into another. This is not that. You're dealing with the existing strand of DNA. By doing that, we are able to speed up the selection process for plants by half, so it will take half as long to get the varieties we want.

[*Translation*]

Mr. Luc Berthold: I am happy to hear that clarification, because your document says “cross-pollinate drought tolerant germplasm”. You are talking about manipulating plant genetic material, but within the plant itself. Is that correct?

Dr. Brian Gray: Exactly.

Mr. Luc Berthold: You also talk about gathering genetic material from certain plants, but within those same plants.

Dr. Brian Gray: Exactly.

Mr. Luc Berthold: The committee heard from representatives of private sector enterprises who are working very hard to find different ways of adapting crops using certain genetic material, whether inside or outside of the plant. They told us that Canada may miss certain opportunities because of the long delays involved in obtaining approval for these materials.

Do your department and the experimental farms provide the approval for the different genetic materials?

Dr. Brian Gray: Yes, if they fall under our area of expertise. As I mentioned, we work with certain specific crops, such as wheat.

[*English*]

barley, potato, and those sorts of crops. We're not in the domain of corn or soybeans, generally speaking, because the private sector is well advanced on those things. As I tried to point out, we're looking for areas where the private sector isn't developing something or isn't developing a product that farmers, producers, or producer organizations would like.

Some of those other growing areas are pulses, specifically pea crops, dry peas, and lentils that we're developing, and some dry beans we are developing for southeastern Ontario.

[*Translation*]

Mr. Luc Berthold: Whether we are talking about internal or external genetic modifications, according to your document, genetics are essential to deal with the coming changes.

Dr. Brian Gray: Yes.

Mr. Luc Berthold: Absolutely?

Dr. Brian Gray: Absolutely.

Mr. Luc Berthold: Fine.

Mr. Rosser, earlier you spoke about the food policy. You conducted consultations on climate change and the importance given to the environment in the food policy. How will the department develop a food policy that will take into account these comments that do not concern production and consumption? In your questionnaire, people were practically asked to answer that question from an environmental perspective. How can this be integrated into the policy?

● (1600)

The Chair: I have to interrupt you here.

Mr. Luc Berthold: Already! I will get back to this later.

The Chair: We will probably have the opportunity to get back to it.

Mr. Longfield, you have the floor for six minutes.

[*English*]

Mr. Lloyd Longfield (Guelph, Lib.): Thank you, Mr. Chair.

Thank you both for coming here. I've seen you both in Guelph recently. It's great to get back together in Ottawa.

Mr. Gray, when we were at the soil conservation event this past July, we saw a lot of examples of soil management. One that sticks in my mind is the use of genetics to develop root structures that go deeper into the soil to return carbon deeper into the soil, and developing the genetics around root architecture so that our soil has a chance to get the carbon replaced. Could you comment on how the interaction between your department and the innovation and science department might work so that we can get solutions like this developed and then to market? How do you collaborate?

Dr. Brian Gray: I guess the department with the most overlap with our mandate would be Environment and Climate Change Canada. We already had a fair bit of collaboration happening at the bench scientist level. It was happening. Scientists do what scientists do. They go to conferences to present their papers, which is an early peek at something that will be formally published later. It's a chance for other scientists to kick the tires so to speak. At those conferences, they meet people with neat ideas they hadn't thought of, and they get together and then they talk about collaborating on new science. In that general process our scientists have come across Environment and Climate Change Canada's scientists, and they were collaborating.

Before I answer it completely, I don't want to leave the impression that nothing was happening, but given this government's mandate, given our minister's mandate letter, we needed to formalize it. So at my level, with Environment and Climate Change Canada, we formalized an MOU, which we both signed, and we have a work plan. In that work plan, I'd say a third of it is something that staff were already doing, but we have new areas that we're going to grow into. This is using existing monies. This is not an opportunity to grab more money. It's just that in these areas where we're working, we can collaborate better. So we'll stay in our own funding envelopes, but we collaborate on the science.

Mr. Lloyd Longfield: Great. Then with this type of a collaboration with Environment and Climate Change Canada, looking at the clean fuel standard, the production of ethanol and putting ethanol into fuels, whether it's diesel or gasoline, Agriculture and Agri-Food Canada is going to play a role in developing new fuels that are more environmentally friendly. When it comes to working on the clean fuel standard, is that something that you're currently working on with Environment and Climate Change Canada?

Dr. Brian Gray: That is not part of the MOU I just mentioned. There are areas that we're collaborating on that are led by Natural Resources Canada, which Tom can speak to.

Mr. Lloyd Longfield: Terrific. I was suspecting that one of the two of you might have a connection to that.

Mr. Tom Rosser: Mr. Chair, the member is quite right that work on the clean fuel standard is led by our colleagues at Environment and Climate Change Canada, but our department is actively collaborating and working with them on it.

Your question reminds me of something I perhaps should have mentioned at the outset, namely, that the bioeconomy is an important part of our efforts on climate change. Not only is it an important opportunity from an environmental standpoint, but also economically. The most recent data from Statistics Canada suggests that the non-traditional bioeconomy, both forestry and feedstock-based agriculture is a $4.3-million industry in Canada and employs thousands of people. Some of that will be biofuels, but of course there are bioproducts, there are car parts, any number of products, usually made from petrochemicals, that can now be made out of renewable feedstocks.

Mr. Lloyd Longfield: I saw it on Twitter today. There's a little more research to be done, but there was an indication that Canada is now leading the G20 in clean technology.

Could you comment on the investments in clean technology? You talk about the projects that could come forward. I know we have one in Guelph, where an auto parts manufacturer is looking at creating renewable natural gas from plastic and then taking the carbon by-product and using that as carbon inputs to possibly fertilizer and other agricultural or industrial applications.

● (1605)

Mr. Tom Rosser: Certainly as a department, we have a history of supporting innovation in the bioeconomy space with respect to agriculture. I think I mentioned in my opening remarks that budget 2017 made an investment of $200 million to support exactly those kinds of opportunities, clean technology in the natural resources sector writ large, including agriculture.

We see that as an additional new source of support to help realize economic opportunities in the agricultural bioeconomy.

Mr. Lloyd Longfield: There's also the Sustainable Development Technology Canada fund. As a member of Parliament, it's hard to direct people to the right places because there are so many. Is there a one-door approach that we're considering?

Mr. Tom Rosser: We as a department, in partnership with a number of other departments, led by colleagues at ISED and Natural Resources, have established a clean technology hub. The idea is to have a single point of contact, where project proponents can go to talk about the full suite of federal supports. That was just recently established in the past several months.

The Chair: Terrific, Mr. Rosser.

Thank you, Mr. Longfield.

[*Translation*]

The Chair: Ms. Trudel, you now have the floor. You have six minutes.

Ms. Karine Trudel: Thank you, Mr. Chair.

Thank you very much for your detailed presentation. We appreciate it.

Earlier you mentioned experimental farms. I must point out that I'm very proud of the work done at the Normandin Research Farm, which is linked to the Quebec Research and Development Centre. I had the opportunity of visiting the farm this summer and of meeting the scientists, people who were full of ideas and passionate about their work. I want to take this opportunity to mention that I strongly encourage providing funding for their activities. I discovered the full importance of research when I visited them this summer.

The new Canadian Agricultural Partnership will soon be in effect, in April 2018. That budget was not increased. However, climate change is having an increasing impact on our environment and our farmers.

I have two questions to ask on this topic.

To what extent will the new Canadian Agricultural Partnership be able to provide the necessary support for Canadian producers?

Will there be new investments to help farmers face climate change and to allow them to adapt quickly?

Mr. Tom Rosser: I am going to try to answer your question. My colleague may want to add something.

Yes, that is one of the six priorities in the new Pan-Canadian Framework on Clean Growth and Climate Change. We are already working hard on this, without waiting for April 1, 2018. We believe we can better target our resources in our negotiations with the provinces and territories, and that we can better use existing resources to advance environmental objectives.

As I mentioned in the beginning, in addition to our planned spending with the provinces and territories in the context of the framework, there are several complementary initiatives, such as investments in clean technology, for instance. We also believe that this can provide a significant source of funding to help us reach our environmental objectives.

Ms. Karine Trudel: Mr. Gray, do you have something to add?

You can answer me in English.

Dr. Brian Gray: I would simply like to thank you for your positive comments about the Normandin farm. I have not visited it yet, as I only took up this position two years ago. It is on my list.

Ms. Karine Trudel: It's only a matter of time.

Dr. Brian Gray: That's all for me.

Ms. Karine Trudel: We've talked a lot about producers. In the area I am from, the Saguenay-Lac-Saint-Jean region in Quebec, there are more than 350 farms. A lot of livelihoods depend on farming, and there are both dairy farms and vegetable farms. In my opinion, the farmers do a remarkable job. When we talk about climate change, we have to remember that they too are a part of the solution. They make a lot of efforts to improve their environment, and they have a lot to teach us, in fact.

This summer, when I visited vegetable producers, I had the opportunity to speak with organic farmers about the problems caused by insects. You spoke about this in your presentation earlier, in fact. Global warming is causing a proliferation of insect pests, on organic and other farms, and they are a serious issue.

Has the department taken global warming and its impacts into account in the implementation of the next framework? If so, what are your strategies to mitigate the risks involved?

● (1610)

[*English*]

Dr. Brian Gray: The minister will announce the details of the new Canadian agricultural partnership at the appropriate time. Once he announces more details, we'd be happy to come back to discuss this.

[*Translation*]

Mr. Tom Rosser: I'd like to add that through our risk management program, there are tools in place that can help farmers manage the risks involved when extreme weather events occur. We already have a framework in place to help producers manage those risks.

Last July, the department decided to renew those programs, and to also review their functioning, in order to determine if changes were needed. We have begun this work and will submit a report to the minister next summer. One of the questions we will examine is the evolution of the risks producers face. We have to determine whether current programs are sufficient to help them manage those risks, or whether we need to make changes to them.

The Chair: Thank you, Mr. Rosser and Ms. Trudel.

Mr. Drouin, you have the floor for six minutes.

Mr. Francis Drouin (Glengarry—Prescott—Russell, Lib.): Thank you very much, Mr. Chair.

I know that risk management programs are being reviewed. However, I was told that even though some producers would like to diversify their crops, the programs do not yet contain any incentives to help them. I know there are negotiations with the provinces, but there are no incentives to encourage producers to act.

In fact, diversification is in itself a risk management program for farmers. Technically speaking, it could cost the taxpayers less.

Do you intend to examine this matter in your review?

Mr. Tom Rosser: Thank you for the question.

Indeed, in our review we want to examine some quite fundamental questions, such as the nature of the risks and their evolution. We are at the very beginning of these analyses. One of the questions we will be studying is the options producers have to manage risks. We have to determine if the private sector would be in a better position to manage certain types of risks, or whether the government could do more. We also want to examine how producers themselves can better manage the risks. We could consider options like the diversification of crops as one way of managing certain risks.

● (1615)

Mr. Francis Drouin: One of the witnesses who came before the committee, and who lives close to me, said that the farmers in our area are still growing corn and soy. It is true that those are the most popular crops. However, when farmers always grow the same products, there is no crop rotation, and so the soil organic matter deteriorates. That is why I am asking this question. It's an education issue.

Does the Department of Agriculture and Agri-Food record information on what is grown in the various parts of Canada? Is there a registry that allows you to access this data, or do you depend on the private sector for that?

Dr. Brian Gray: I mentioned the Centre for AgroClimate, Geomatics and Earth Observations, which provides information on the major crops throughout Canada. I think this data is available on our website.

Regarding risks, I mentioned the scientific living laboratories. This is on page 15 of the presentation. They provide an opportunity to work with farmers and producers to find the best system or the best rotations for every climate and region. They also provide an opportunity to develop partnerships and experiment with various crops.

[*English*]

Mr. Francis Drouin: I know GMOs and genetics will play a major role in the future, especially for climate science. Speaking to organic farmers, I'm trying to determine, in plant breeding, at what point it is still an organic plant. Is there a strict determinant for this?

Dr. Brian Gray: I'm sure there are several, depending on the domain. Unfortunately, I don't know. We can come back with the answer.

It's a very important point. Several members have mentioned the exploding domain of genomics. Because of high-sequencing machines, we can now get the information on the genomics of an individual plant or virus, for example, about 1,000 times faster than we could five years ago. Actually, the sequencing is faster than Moore's Law, so our problem will be that we're running out of capability to analyze or store it.

The area that's really interesting, and it touches on your question about organic farming, is the soil microbiome. The microbiome is the bacteria, the fungi, and the viruses that are living in that soil. I can't remember off the top of my head, but something to the effect of a teaspoon of soil would have over a million organisms in it, and those million organisms might be represented by a thousand species. Until we were able to develop high-sequence genomics, we couldn't know that. We don't know what the perfect soil is for a particular soil type or region, but we're going to get there some day. Understanding how that microbiome is reacting to corn and soybean rotation year after year, or an organic situation, or natural or synthetic fertilizer inputs, or any of these things will be critically important, and it will be a huge breakthrough.

The Chair: Thank you, Mr. Gray.

[*Translation*]

Ms. Nassif, you have the floor for six minutes.

Mrs. Eva Nassif (Vimy, Lib.): Thank you, Mr. Chair.

I also thank the two witnesses for their presentations.

Since I did a masters in proteomics, I am happy to hear the world “genomics” used in connection with agri-food.

I'd like you to give us some specific examples of problems that are of concern to your department in regard to the land degradation caused by climate change. What areas would benefit from research, specifically?

● (1620)

[*English*]

Dr. Brian Gray: Right now in our branch we have over 700 research projects under way, and a significant number of those include soil research. I don't know, but I could come back to you with how that's broken down specifically in terms of microbiome versus organic soil quality or inorganics. This is an area in which we're seeing growth. We're in a period now in which a lot of our baby boomer scientists are retiring and we're replacing many of those with scientists from areas of microbiome, areas of chemistry that didn't really exist when these scientists started their careers, and areas of high-speed gene sequencing and informatics. This is the new domain. We still need what we would call the "agronomy scientists". Those have been around for a long, long time, and we still need them, because we need somebody to pull it all together for a systems approach—knowing the rotation of the crops, the types of crops, and those sorts of things.

[*Translation*]

Mrs. Eva Nassif: Mr. Rosser, did you want to add something?

Mr. Tom Rosser: No. I think my colleague is in a better position to answer that question.

Mrs. Eva Nassif: Fine. I will ask another question.

In the past, the Government of Canada has supported environmental sustainability through its agricultural policies. In the context of the new Canadian Agricultural Partnership, how do you intend to use or improve these approaches?

Mr. Tom Rosser: Mr. Chair, I'm going to try to answer, but Mr. Gray may have something to add.

It is true that with the current framework, we made some important investments in the environment, but we think that thanks to better knowledge, it will be possible to better target the investments we make and to make progress in reducing greenhouse gases.

In addition, we think that we can better focus our programs and structures on reducing emissions and on adapting to climate change.

Mrs. Eva Nassif: What is being done currently in the agri-food sector to reduce greenhouse gases?

[*English*]

Dr. Brian Gray: There are several things, including that we are looking at how we treat the soil, because the soils can be a sink for carbon, as I think you heard on Tuesday. We can actually reduce some of the CO2 in the atmosphere through the sinks.

Also, as I mentioned, the way we apply nutrients to the soil is very important, because nitrous oxide is a molecule that's released when you have too many nutrients in the soil. It's released through microbiome breakdown of different molecules. One molecule of nitrous oxide is equivalent to 298 molecules of CO2, so it's a big deal. If we can look at changing the microbiome and changing the way we apply fertilizers, we can reduce that heavily.

Methane is another one, which is from dairy cattle and mainly beef cattle. The digestive process gives off gases. It's significant. We can reduce that. We're working on science to reduce that. You can do it through genetics, through breeding. There are cows that are naturally more efficient with food. You can also do it through diet. We've been successful in developing lines of beef cattle and diets for dairy cattle through which we're actually reducing the GHG emissions of an animal per litre of milk or per pound of beef depending on the animal.

Those are two or three examples specifically in areas that we're working on now.

● (1625)

Mr. Tom Rosser: I'll add that from a programmatic perspective, we take some of the things we learn from our science and try to operationalize them in individual producers' farms, and through our cost-shared programming with provinces, we'll support the development of what are called "environmental farm plans" whereby an assessment will be made of where there are opportunities to improve the environmental performance of a farm.

Also, we have what are called BMPs, beneficial management practices, if I remember correctly, whereby we can provide incentives to actually put in place some of the recommendations that come out of those audits. Those are programs that are cost-shared. They're delivered by provinces, so the specifics of how they operate vary from province to province, but that's the basic idea, and that's one of the ways in which we try to make a difference on the ground.

The Chair: Thank you, Mr. Rosser.

[*Translation*]

Thank you, Ms. Nassif.

Mrs. Eva Nassif: Do I have any time left?

The Chair: No, unfortunately, you're out of time.

[*English*]

Mr. Barlow, you have six minutes.

Mr. John Barlow (Foothills, CPC): Thank you very much, Mr. Chair.

Thank you, Dr. Gray and Mr. Rosser, for coming with some great information. We appreciate your time.

I want to talk initially about a memorandum that was given to the minister last January entitled "Potential Impacts of Carbon Pricing on the Primary Agricultural Sector". I wonder if I could ask the officials if they would be able to submit this document for this study before the latter is complete. It is public information. I just want it to be part of the study.

Mr. Tom Rosser: Mr. Chair, I'm not specifically aware of the document. I'm familiar, I think, with the analysis in the document itself, but certainly we do have information in the public domain on our work in this area that we'd be happy to supply the committee with. Not being exactly familiar with the document the member is referring to, I can't specifically answer the question, but, yes, we can certainly provide some information on our work in that area.

Mr. John Barlow: That's great. I appreciate that very much.

I want to talk a little about some of the information in the study. I understand that you may not be totally familiar with it, Mr. Rosser, but you can maybe help with some of the other information you are aware of through that.

One of the key points in this memorandum was the fact that there will be a significant difference in the impact that the federal carbon tax will have on eastern Canadian farmers compared with western Canadian farmers. The numbers here for western farmers is likely around $3,700 a year, and for eastern farmers, $2,400 a year. Those numbers are a concern. They had mentioned this was a preliminary study, that there's some uncertainty in those numbers and that further analysis would be done.

Do you know if any further analysis was done on some of that data that came forward?

Mr. Tom Rosser: Mr. Chair, I'll make a couple of comments.

The member is quite right. I believe he indicated that the memo in question dated from January. It is true that we've done some analysis in this area. It was done before the pan-Canadian framework was negotiated and, therefore, didn't incorporate some of the features of the framework, such as the exemption for on-farm fuel use, which is part of the emissions pricing system in British Columbia and in the federal legislation. So there have been changes and developments since then.

First of all, one of the bigger conclusions of the analysis was that even at a $50-a-tonne carbon price, the impacts in percentage terms on producers were relatively muted. My recollection is that they're in the neighbourhood of 1% or 2%. The differences across provinces and regions that were observed in that analysis, I think, stem from differences in the electrical generating mix across provinces. I hope that helps to clarify things.

Mr. John Barlow: I appreciate your details on that. Would you be able to submit that initial analysis as part of that information, as part of the study, as well?

Mr. Tom Rosser: Certainly information related to this analysis is in the public domain. There have been some efforts to update and refine it. I believe as well that my colleagues in Environment and Climate Change Canada have done some analysis in this domain that reached similar general conclusions, although it was a different methodology and specifics.

Yes, we're certainly happy to supply information. We do have information that we can share. An update of this analysis is under way. I'm not certain if it's ready for publication yet, but our intent would be to make it publicly available once it is.

● (1630)

The Chair: Mr. Barlow, you have two minutes.

Mr. John Barlow: Thank you very much, Mr. Chair.

I want to take the last two minutes for the motion that I tabled at that last meeting. I want to discuss that briefly and hopefully have a vote on it. I can read that motion into the record.

> That, pursuant to Standing Order 108(2), the Standing Committee on Agriculture and Agri-Food undertake a study of the renewed Trans-pacific Partnership (TPP) agreement and take into consideration of the opportunities available to the agricultural sector given the withdrawal of the United States from the trade deal; and that the Committee report its findings to the House.

I certainly feel with today's developments, this is quite timely, due to the fact that we may or may not have signed an agreement. I know we're not exactly sure. We've heard yes and no. Regardless, I know this was studied previously but that it was a significantly different study. Also, the United States was part of the initial TPP agreement, but is no longer a signing or founding member of the agreement.

I think it's certainly worthwhile for us to take a look at it. I'm assuming that my colleagues from all parties have had similar conversations to ones we have had with our stakeholders and producers, who are eager to be part of this agreement. They see this as a greater opportunity for Canada, with the United States out as a member, and they want us to move on this quickly. I think this is a great opportunity to listen to our stakeholders, do some work on this, and find out what the opportunities and possible obstacles would be for Canada to be part of the TPP without the United States.

Thank you, Mr. Chair.

The Chair: Thank you, Mr. Barlow.

Is there discussion on the motion?

Mr. Peschisolido.

Mr. Joe Peschisolido (Steveston—Richmond East, Lib.): Chair, I think once again that Mr. Barlow is right that Parliament should be looking at this. The TPP is a very important possible trade agreement. It has a variety of stakeholders involved on a lot of issues.

I'm not sure we're the proper committee and forum to look at it. We do have a trade committee. We do have a foreign affairs committee, so even though I support what Mr. Barlow wants to do, I don't think it's the role of our committee to do just that.

[*Translation*]

The Chair: Mr. Berthold, it is now over to you.

Mr. Luc Berthold: Thank you, Mr. Chair.

Thank you, Mr. Peschisolido.

I heard what you said about the committee not being the right forum to do a proper study. The government is in the midst of extensive consultations and is receiving numerous requests regarding the food guide. We are being told that this committee isn't the right forum to discuss the food guide and that it's a Health Canada matter. We are the Standing Committee on Agriculture and Agri-Food, though. We have to stop being afraid to talk about issues that affect the people who feed Canadians.

The Trans-Pacific Partnership, or TPP, is of great interest to Canada. It is important not only for trade, but also for grain, dairy, beef, and poultry producers. It's a deal that matters tremendously to all the Canadian farmers and processors we represent. They want access to that market, which, as we all know, is vast. That is all the more important given today's news that India is imposing new 50% tariffs, a devastating blow to Canada's agricultural industry.

We mustn't close our eyes. We have to listen to our producers and give them the opportunity to be heard. The very role of the Standing Committee on Agriculture and Agri-Food is to give Canadian producers the chance to speak to the members of Parliament on the committee. In each of our parties, we were chosen by the people to represent their interests on this committee. We should hear what they have to say and include their recommendations in a report, which would then make its way to our parliamentary colleagues, including the ministers responsible for trade negotiations, international trade, and global affairs.

Unfortunately, we learned that the Minister of Agriculture and Agri-Food will not even be at the TPP talks next week. As far as I know, the Minister of Agriculture and Agri-Food under the previous Conservative government always took part in those talks.

It's important that our committee send a clear message to Parliament and the government: agriculture must figure prominently in the negotiations. We cannot behave as though products come ready-made and ready to go. Our involvement is all the more essential given that, according to its most recent budget, the government intends to significantly expand Canada's agricultural production in the coming years. The objectives are ambitious, and one way to achieve them is for producers to have access to new markets.

We do, however, have to overcome a major TPP challenge: a key player has backed out. The negotiations that took place involved 12 countries originally and no longer necessarily apply to a TPP deal between 11 countries. The concessions that were made in the context of a 12-country TPP may not apply to the negotiations for an 11-country TPP. If the committee does not seize this opportunity for Canadian farmers to have their say, I can't see who in Parliament will.

That is why I urge my fellow members to think seriously about allowing the committee to discuss the TPP as soon as possible and to hear what producers and members of the agrifood industry have to say about it.

I haven't been on the committee for the past two years, but I believe it has already looked at the issue of the TPP. Have you examined it?

● (1635)

The Chair: I believe so.

Mr. Luc Berthold: That's what I thought.

[*English*]

An hon. member: In 2016.

[*Translation*]

Mr. Luc Berthold: Okay, that was in 2016. In that case, it would simply be a matter of doing an update on the study to take into account the current situation.

I can't see what we're doing here if we let others speak on our behalf any time an issue that affects agriculture and agrifood stakeholders comes up.

I therefore humbly ask my fellow members for their co-operation in getting this motion passed so that we can discuss TPP 11 as soon as possible.

The Chair: Thank you, Mr. Berthold.

Mr. Longfield, you may go ahead.

[*English*]

Mr. Lloyd Longfield: I apologize to our witnesses. I'm looking forward to discussing the important study we're doing right now on soil and climate change. We're in the midst of looking into the negotiations with the TPP 11; we're not in the midst of negotiations on TPP 11. We're also working on NAFTA. The timing of our looking at this study would be very premature. As Mr. Peschisolido also said, there are other committees that might be participating in this, so I wouldn't support this at this time. We could talk about this in future business or at another time. When we have witnesses here who are willing to contribute and have travelled distances, I think we should continue the discussion with them.

The Chair: Thank you, Mr. Longfield.

[*Translation*]

Ms. Trudel, you have the floor.

Ms. Karine Trudel: Thank you, Mr. Chair.

With respect to this motion, I would like to point out that the renegotiation of the Trans-Pacific Partnership is under way. Originally a deal between 12 countries, it now involves 11. As we know, the TPP poked a hole in our supply management system, a 3% market share, in fact. I think we need to hear from our dairy producers and assess the adverse effects that hole could have. Having the Standing Committee on Agriculture and Agri-Food hear what they have to say is not only relevant, but also timely.

Yes, the issue we are studying now is a very important one, and we will continue that study. Given, though, that the negotiations are happening as we speak, I think we would do well to hear from dairy producers on the Trans-Pacific Partnership. That is something we could be proud of.

Thank you.

The Chair: Thank you, Ms. Trudel.

It is now over to you, Mrs. Boucher.

Mrs. Sylvie Boucher (Beauport—Côte-de-Beaupré—Île d'Orléans—Charlevoix, CPC): Good afternoon.

I agree with the member. I, too, am new to the committee, and I must say how surprised I continue to be at the lack of co-operation that seems to prevail. We are talking about things that are happening here and now. If we put this off another five months, it will be too late.

At some point, we have to know when to make allowances. This isn't a partisan issue. We are talking about a situation that is unfolding as we speak. The U.S. withdrew from the deal; this is a discussion we have to have. What is the point of the Standing Committee on Agriculture and Agri-Food if its members always remain silent to the detriment of the constituents they are supposed to stand up for? What purpose do we serve if we can't give ourselves the latitude to have this discussion?

I'm not used to this. I am accustomed to the high level of co-operation on the Standing Committee on Official Languages. As members, we are occasionally confronted with issues we would prefer not to deal with, on both sides of the House, but we do it anyways because we have to rise above partisanship.

This is not about partisanship, but every time we put forward a motion, as government members, you dig in your heels. To be perfectly frank, I must say I find it unsavoury.

● (1640)

The Chair: Thank you, Mrs. Boucher.

Your turn, Mr. Berthold.

Mr. Luc Berthold: Thank you, Mr. Chair.

First of all, I do want to thank the witnesses for being here, but I will point out that we have two hours to hear from two witnesses. Therefore, I don't think it's unreasonable to take a few minutes to deal with this issue, especially since we heard today that the TPP discussions seem to be moving quickly.

Second of all, it was said that the committee should not study the matter because negotiations are in progress, but if we wait until they are over, it will be too late. By the way, the department was in the midst of extensive consultations on Canada's food policy when the committee decided to undertake its own consultations on the same subject, at the same time. That didn't factor into our decision. It didn't prevent the committee from undertaking its own study. As far as I know, the committee makes its own decisions. It does not have to wait for instructions from the government or the minister's office. Unless I'm mistaken, the committee is entirely independent.

Consequently, we can choose to conduct this study and to give Canadian producers and agrifood industry stakeholders the opportunity to tell us what they think. We can also choose not to hear from them. It's in your hands, since there are more of you. Clearly, if you choose to give witnesses and producers the opportunity to speak, we will hear from them, but if you don't, we will not.

That's all we have to say on the matter.

The Chair: Thank you, Mr. Berthold.

Over to you, Mr. Drouin.

Mr. Francis Drouin: I'd like to make something clear to the committee.

Mr. Berthold, we already agreed that we would go through the subcommittee. Less than two weeks ago, we reached a consensus on the committee's agenda. Even though the issue is making headlines today, the Minister of International Trade's commitment to engage in talks with the TPP's 11 members is nothing new. It wasn't something that was all of a sudden.

If you wanted the committee to deal with this issue, perhaps you should have proposed the idea at the subcommittee's last meeting. That didn't happen, however. Since we had already come to an agreement on the agenda for the study, we aren't going to abandon the timetable all because this issue happened to feature in today's headlines. That's all we have to say on the matter.

Thank you.

The Chair: Thank you, Mr. Drouin.

[*English*]

Mr. Barlow.

Mr. John Barlow: Thank you very much, Mr. Chair.

I appreciate the comments by my colleagues across the way. However, the fact that we have an agreement, or a potential agreement, that will have an impact on every single Canadian farmer and producer in the country—

You're shaking your head, Mr. Longfield, but you're not willing to take five or 10 minutes to discuss an agreement that could possibly impact every producer, because you're worried about the two hours that we have with our two witnesses.

Mr. Drouin, I really do appreciate what you're saying, but you're saying that we can't disrupt this committee's schedule because a very critical issue, a very vital issue, came up today. You're saying, let's not discuss that because it's not part of the agenda we decided on weeks ago.

Come on, you guys. When something important comes up, that's what we're here for, to discuss these types of issues that will have an impact on our producers, our farmers, the agri businesses, and agrifood across the country. If we are continually passing on every study that we think is important, or you think is important, to another committee because it's not our job, then what are we here for? Seriously, what are we here for, other than saying that it will take up two hours of your day for no reason?

You guys cannot dispute the importance and the impact that the trans-Pacific partnership agreement is going to have on the Canadian agriculture industry. For us to say that we are not going to discuss it because it's not on our agenda that we discussed a couple of weeks ago.... This is critical.

Moving forward, what is the message? Is it that if any other critical issue comes up that will impact Canadian agriculture, if it's not something we put on our agenda months ago, it's not worth talking about? That's not the message I want to send to our stakeholders across the country, that "I'm sorry, this is something that's going to impact your livelihood, but it's not something that we have on our agenda for the next couple of weeks and it's not something that I want to take 10 minutes out of a two-hour committee meeting to discuss, because I don't think it's worthwhile."

I want to leave that with you. I'm not trying to make this political. I know you guys have had the same discussions with your stakeholders that we have had with ours. The importance of the trans-Pacific partnership agreement, positive and negative, is something that our stakeholders are asking us to discuss, want us to discuss. With what transpired today, we have an opportunity now for a timely and very good discussion on what direction the trans-Pacific partnership agreement is going to take and the impact it's going to have on our stakeholders.

For my colleagues to make this about our already having set our agenda and upsetting the officials who are here for two hours is really disconcerting. I have to ask, are these key issues a priority for you guys or not? For us to not do this study is disappointing.

Thank you, Mr. Chair. I appreciate that. Sorry for the rant.

● (1645)

The Chair: Thank you, Mr. Barlow.

We're ready to move to a vote on the motion. You all have the motion. It has been distributed in both languages. Could I have a show of hands as to who would support the motion?

Mr. Luc Berthold: May we have a recorded vote?

[*Translation*]

The Chair: All right.

(Motion negatived: nays 5; yeas 4)

[*English*]

The Chair: Thank you very much.

[*Translation*]

We will now turn our attention back to our witnesses.

Mr. Peschisolido, you may go ahead for six minutes.

[*English*]

Mr. Joe Peschisolido: Dr. Gray and Mr. Rosser, thank you so much for attending and providing me and everyone here with a great deal of insight into issues that are complicated and technical. It's at moments like this that I wish I'd taken chemistry and biology at university.

Mr. Gray or Mr. Rosser, I'm assuming both of you put together the presentation. Page 9 encapsulates the broad strokes of it. The first part says, basically, that we want to try to prevent climate change, but that in the process, we also want to take advantage of possible opportunities from climate change. You put it much more eloquently than I just did. We're trying adapt to it while simultaneously trying to mitigate it.

The second point you discussed was the whole notion of increasing productivity, but also decreasing the resources that you're using, basically producing more stuff, but making sure that, while producing more stuff, you're not getting more emissions in the air, but preventing climate change.

As a government, we're looking at two main areas. You have the side of laws and regulations and then funding. Not getting into the specifics, are there any particular areas of funding you think we should look at in those four areas that I talked about, beyond what you've talked about here? Also, on the regulatory side, we had witnesses, either at the last session or the earlier one, saying that perhaps the regulations are a bit too onerous, and other witnesses said that perhaps they're not onerous enough.

I'll leave that to Dr. Gray and Mr. Rosser to comment.

Dr. Brian Gray: Mr. Chair, I can take a stab at the funding question, and I'll leave it to my colleague to talk about the regulatory question.

As Tom mentioned, we're in what's called Growing Forward 2. It's the tail end of the existing five-year agricultural policy framework. It has evolved over the three policy frameworks. In that, there's a program of industry-led clusters. Those are industry-led research and development clusters of dairy, beef, pork, and pulses. Those are examples of big ones. Within that, there are opportunities for industry to tell us the big things they need developed and what they need answers to. Those are complemented by the science that our branch does, which is further upstream, longer term, more risky, more foundational, and with longer periods for getting answers to questions. We collaborate together on those.

As I mentioned earlier, we're not in a position to talk about the next one. We'll let our minister announce that and speak in more detail, and I would be happy to come back and unpack that.

Producers, the producer organizations, will tell you that the way we've been doing the collaborative research led by industry and Agriculture and Agri-food Canada has been working. We've evolved through the policy frameworks based on their input and on evaluations by our internal evaluation program. Again, I can't speak to the details on funding, but in the current policy framework, there's a fair bit of money that goes out to industry that has to be matched by industry for big clusters and then for smaller research projects.

When it's appropriate for us to talk about the Canadian agricultural partnership in more detail, I would be happy to do so.

● (1650)

Mr. Tom Rosser: I might just add briefly, from a policy standpoint, that emissions from the agricultural industry are fairly significant and contribute to the national total roughly 10%, I believe. Many of them are biological in nature. They don't lend themselves to being addressed by regulatory methods, for the most part.

Through the agricultural partnership, we do have programs in place to help producers identify opportunities to improve environmental performance. We have some incentive programs to help them effect changes. There are tools in place, and they've proven to effective over time at reducing the emissions intensity of the agricultural sector. I think there is scope for additional policy thought, in terms of another mix of tools and how one might most effectively encourage further reductions in those emissions.

Mr. Joe Peschisolido: I believe it was Dr. Gray who talked about the new domain sciences, that there has to be a rethink in chemistry and biology to get a handle on this. In my neck of the woods you have UBC and Simon Fraser. In my riding specifically, you have Kwantlen Polytechnic. Is there anything that we're doing in the policy framework now that will provide either funding or guidance to institutions across Canada? If there is not, can there be?

Dr. Brian Gray: Yes, for example, we have a partnership with the University of British Columbia at our Agassiz Research and Development Centre. They have their experimental dairy there. We're negotiating the new MOU. In that, we're going to collaborate more deeply in the area of manure management and what it's doing to the soil microbiome, water runoff quality, and also greenhouse gas emissions. That's a very specific example of one of the universities we work with.

The Chair: Thank you, Mr. Gray. I have to cut you off.

[*Translation*]

Ms. Boucher, you may go ahead for five minutes.

Mrs. Sylvie Boucher: Thank you, Mr. Chair.

I'll be splitting my time with Mr. Berthold.

We've talked a lot about climate change. Mr. Rosser, when you develop a climate change policy, you meet with the scientists studying climate change, but do you also talk to producers—the people who are on the ground, literally, working the soil?

When you develop programs, do you make sure they are adapted to the needs of the region where they will be implemented, or, conversely, is the process static and one-sided?

● (1655)

Mr. Tom Rosser: I'd like to thank the member for the question.

Before negotiating the renewed framework with the provinces and territories, we held nationwide consultations with producers and stakeholders to gain a clear understanding of their priorities.

The lion's share of our environment and climate change programs are implemented by the provinces. Although the objectives are the same across the country, the provinces retain some flexibility to address the priorities of farmers in their own regions.

Mrs. Sylvie Boucher: What you're saying, then, is that programs are developed unilaterally, but that it is up to the provinces to adapt them to their own needs. Is that correct?

Mr. Tom Rosser: The provinces implement the programs. Program implementation and funding are the subject of federal-provincial negotiations, during which, provinces have an opportunity to adjust priorities and a say in managing the program in the best way they see fit.

Mrs. Sylvie Boucher: Very well. Thank you, Mr. Rosser.

The Chair: Mr. Berthold, you have two minutes remaining for your questions.

Mr. Luc Berthold: Thank you, Mr. Chair.

Although we talk a lot about climate change and the environment, it's a pleasure for the members of the Standing Committee on Agriculture and Agri-Food to have you here. It shows how various issues can be intertwined. On some issues, it's important for the Standing Committee on Agriculture and Agri-Food to hear about matters of environmental concern. That's a nod to my colleagues across the way.

I'd like to ask you about policy development, be it in the area of climate change, food, or other. Over the past few weeks and months, we have witnessed instances where newly developed policies met with unintended consequences a few weeks later. The tax reform package is one such example.

When you develop a policy, like the food policy, do you assess its economic impact on producers? Do you systematically assess the domestic and international impact on production and trade? The differences in tariffs and production costs from province to province and country to country are a huge factor.

Mr. Tom Rosser: Thank you for your question.

Yes, we do have a group that performs economic assessments of trends and opportunities in the agricultural sector. From time to time, we do evaluate the impact of certain policies on the sector.

Something else we do in connection with that is work towards better co-operation with the provinces and territories when it comes to sharing data on program effectiveness. That helps us measure outcomes better and make appropriate adjustments.

Mr. Luc Berthold: What I gather, then, is that you do not systematically assess the economic impact of policies. In the case of the food policy, are you conducting an economic assessment in conjunction with the current policy study?

The Chair: Mr. Berthold, I'm afraid your time is up.

Ms. Trudel, you have the floor for three minutes.

Ms. Karine Trudel: Thank you, Mr. Chair.

I'm going to pick up on the topic I brought up earlier.

You touched on it with Mrs. Boucher, but I'd like to revisit the AGRI programs.

Where I'm from, Saguenay—Lac-Saint-Jean, people were hit hard by a hailstorm that completely wiped out corn crops in Saint-Bruno. Vegetable growers in Saint-Fulgence saw their fields ruined by a tornado, costing them not only crops, but also their entire season.

I realize that negotiations take place at the provincial level, but producers in my region tell me that the program eligibility criteria are so strict that they do not always qualify. Some of them suffered huge losses—their entire summer income.

How do you plan to adjust the crop insurance program?

● (1700)

Mr. Tom Rosser: I believe we already discussed that. The federal and provincial ministers announced a review of all the programs. We want to make sure the program takes into account climate change and the risks it represents for the agricultural sector. As part of that review, in addition to conducting assessments, we want to give farm operators and producers an opportunity to share their priorities and program concerns with us.

We are hoping that, by next summer, we will have enough information to advise the minister on how to make the program better, so that it reflects the actual effects and risks farmers are facing on the ground.

Ms. Karine Trudel: That's great.

Now I'd like to discuss water and soil conservation, which we haven't talked a whole lot about. What approach are you going to recommend to the government to help the agricultural sector better manage water and soil conservation?

[*English*]

Dr. Brian Gray: As Tom mentioned, in the current framework we have programs that are decided bilaterally between provinces and the federal government on what sort of beneficial management practices a province and the federal government would like to make available to producers. Those practices would include the conservation of soil and the protection or conservation of water, whether it be too much or too little water.

In that process, we know a little bit about a lot of those beneficial management practices, enough to know that we think they're pretty good, so let's try them. What we're proposing with the living labs, *les laboratoires vivants*, is to actually work with producers to scientifically measure how much carbon it will captures. We think it will capture carbon, but how much will it capture? In the process of capturing carbon, it's also building the microbiome in the soil at the same time.

That's something that we need to do. We need to take a systematic approach because we need to understand the entire system—what was growing there three years ago, five years ago, and last year—so that we can provide science to help producers protect their systems and farms from catastrophic attacks of pests. In the existing framework, the department does have backup risk management for those situations where a producer faces a catastrophic loss.

The Chair: Thank you, Mr. Gray.

[*Translation*]

Thank you.

[*English*]

Folks, we have gone through our two rounds. We have about 25 minutes left, and if our panel permits, do you want to go with another round?

An hon. member: Yes, sure.

The Chair: Okay, if we allow all parties 6 minutes, would that work?

Mr. Luc Berthold: Each party would have a final one.

[*Translation*]

The Chair: Each party could take turns asking questions. Would that work for everyone?

Very good. That is how we will proceed for the remainder of the meeting.

Following the usual order, I will give the floor to Mr. Berthold, for six minutes.

Mr. Luc Berthold: Thank you, Mr. Chair.

I'll be sharing my time with my colleague Mr. Barlow.

Mr. Rosser, do you have the answer to my question? Aha!

● (1705)

Mrs. Sylvie Boucher: What was your question again?

Mr. Luc Berthold: I wanted to know whether an economic assessment was under way in relation to the food policy, or soil conservation or soil quality.

Mr. Tom Rosser: Sometimes, we conduct targeted analyses of certain policies. It can be tough to measure the impact some policies can have on the agricultural sector. In those cases, we carry out microanalyses in an effort to assess the impact of our programs and initiatives, as well as to determine whether they are having the expected results.

Mr. Luc Berthold: We know that the environmental dimension has just been added to the food policy. Soon, we will have to deal with the carbon tax, which will have an impact on Canada’s competitiveness.

From what I heard, studies may sometimes focus on a portion of the policy. In my opinion, when you start an extensive study like this, it is important to consider the consequences of each decision being made so that we can then help the government make a more informed decision.

I rarely make recommendations or suggestions, but would it not be appropriate to consider doing this systematically or is it a new solution that could be adopted by the government?

Mr. Tom Rosser: I would like to clarify what I meant. Often, whenever possible, we conduct economic analyses on our policy development. Canada's agriculture and food sector generates about $110 billion for our economy.

When it comes to smaller, more targeted programs, it is unlikely that we can measure the economic impact of certain initiatives on the sector. In that case, we try to use other ways to measure the impact. However, we have significant economic analysis capacity in the department and we use it whenever we can to inform our policy-making.

Mr. Luc Berthold: During the consultations and discussions with the public, I think it would be useful to keep adding this component. Actually, we are told that climate change has a cost and that the way it is managed varies depending on the location.

In my opinion, this should be factored in when studying the state of the soil or new techniques to adopt.

Earlier, Mr. Gray talked about benefits. Will the benefits to farmers offset the disadvantages? Perhaps so; perhaps even climate change will benefit a number of producers. In so, there's no real problem. It will be possible to offset the costs of research and the change in culture. That's my suggestion.

I'm going to give the floor to my colleague Mr. Barlow, who also wanted to ask a question.

Mr. John Barlow: Thank you very much.

[*English*]

Before I ask my question, I'm just going to leave this with my colleagues about our discussion earlier today. I think it's important that we remember whom we work for, that we work for our stakeholders and constituents, not necessarily government officials. I just want to make sure that's clear out there, who our priorities are on here today.

Dr. Gray, could you answer the following for me? I'm from western Canada, and maybe we're a little bit different. Our parcels are bigger and whatnot. One of our witnesses earlier said that two-thirds of farmers in eastern Canada are still tilling, that they haven't accepted no till.

Tom, you're shaking your head. Maybe Mr. Rosser is better to respond to this, but what is the reason for that insistence on continuing with those types of practices when we've seen the benefits of no till, not only on the cost of the operation, but also the environmental impact, the moisture in the soil, and those kinds of things? Is it an educational issue, or is there something we're not doing that we could be doing to try to encourage that no-till practice?

Dr. Brian Gray: Thank you for the question. I'm not an expert to answer this. I can give you a broad response.

Yes, there's room for improvement in eastern Canada, but I wouldn't go so far as to say that all of the land being tilled can go to zero till. It's complicated. There are areas that are too wet. There are areas where the soil, quite frankly, is too heavy. There are areas where we don't have the perfect tool of zero till.

However, as I imagine your witnesses on Tuesday would have said, there's lots of room for improvement. Generally speaking, the farms are much bigger in western Canada and it's easier to recapitalize. When you go from a plow-disc cultivated system to a zero-till one, you have to buy new equipment that's very expensive. It's generally easier to buy that equipment when you're already working on a large scale. That's my simple response, but we could have people come back to give you more information on the specifics.

● (1710)

The Chair: Thank you, Mr. Gray.

Thank you, Mr. Barlow and Mr. Berthold.

[*Translation*]

Mr. Poissant, you have the floor for six minutes.

Mr. Jean-Claude Poissant (La Prairie, Lib.): Thank you, Mr. Chair. I also want to thank the witnesses.

I have three or four questions, but we will stick to the best ones, if I may put it that way.

I'm wondering whether there is any data on the amount of greenhouse gas emissions from animals compared to plants.

Do you have any figures that could give us an idea?

Mr. Tom Rosser: I thank the parliamentary secretary for the question.

Yes, absolutely, we have data. Unfortunately, I do not know whether I have them with me right now, but we can follow up. As I recall, greenhouse gas emissions from animals make up the bulk of total emissions. It is a significant proportion.

I'm reluctant to provide specific numbers, because I do not have that data on hand, but they are available. We will forward them to the clerk of the committee.

Dr. Brian Gray: I can answer the question in general terms.

On page 8 of my presentation, there's a chart. Overall, animals, such as cows, are responsible for about 40% of Canada's greenhouse gases when CO_2 or the equivalent is used. Manure is responsible for about 10% to 15% of greenhouse gases. The N_2O from soil is also responsible for about 40% of the gases. Managing N_2O in the soil is therefore a major challenge for conservation.

Mr. Jean-Claude Poissant: Okay. This is a good way to determine which aspect we should focus on.

Dr. Brian Gray: Exactly.

Mr. Jean-Claude Poissant: That's my understanding.

In the last two budgets, 2016 and 2017, I think the government invested $70 million in 2016 and $77 million in 2017 in research and innovation.

I was not here in previous years. What were the approximate amounts invested in research and innovation?

Dr. Brian Gray: Is your question specific to the science and technology branch of the department?

Mr. Jean-Claude Poissant: Yes.

Dr. Brian Gray: Our budget is about $240 million for the entire science and technology branch. It's been fairly stable over the last three or four years.

Mr. Jean-Claude Poissant: Could you also tell me about your relationship with Environment and Climate Change Canada?

Are there regular meetings with officials from your department to discuss what could be put in place so as not to affect the agricultural sector too much?

Dr. Brian Gray: I can answer first.

As I mentioned, we have an agreement with the Department of Environment and Climate Change. Assistant deputy ministers meet twice a year, and a working group of directors general meets quarterly. In addition, researchers from the research program meet frequently.

● (1715)

Mr. Tom Rosser: Mr. Chair, I would like to add something.

In addition to our collaboration with the Department of Environment and Climate Change, and in keeping with our agreement, there is an interdepartmental process geared toward advancing the pan-Canadian framework on clean growth and climate change. We have a committee of assistant deputy ministers that meets regularly. The Privy Council Office and the Department of Environment and Climate Change co-chair those committees, in which we participate.

Mr. Jean-Claude Poissant: Do I have any time left?

The Chair: Yes, you have 45 seconds left.

Mr. Jean-Claude Poissant: We talked about genomics, in which I am a firm believer. Dairy companies do genomic studies on farm animals. This makes it possible to significantly reduce the number of head of livestock to be raised, and to obtain better returns. Companies can better manage their business.

Does genomics research have a limit?

Dr. Brian Gray: Thank you for your question.

Frankly, I have no idea, but there is probably a limit.

Cattle breeds that are very efficient in terms of diet have been developed. Nutrition is very effective with these cows compared to other breeds, which is a good thing. The productivity of these cows is quite close to the limit. However, I think we can still improve the effectiveness of each cow.

The Chair: Thank you, Mr. Gray and Mr. Poissant.

Ms. Trudel, you have the floor for six minutes.

Ms. Karine Trudel: Thank you.

We are talking a great deal about agriculture, but in my region, Saguenay—Lac-Saint-Jean, we are surrounded by forests. The forest is a large garden that grows; it's alive. We harvest it and we work it; it's like a living garden. Trees are major carbon sinks.

We are talking about forest residue and biomass. Does the department have investment programs to help businesses grow? We could do a lot of things with the forest residues.

To your knowledge, are programs going to be put in place eventually? Are there already measures in place to encourage the cultivation of our forests and open up new markets for forest residues?

Mr. Tom Rosser: I can try to answer your question.

Yes, there are a number of connections between the agricultural sector and the forestry sector with respect to bioeconomy. Technologies make it possible to use agricultural and forest residues. The $200 million from budget 2017 earmarked for clean energy initiatives will encourage the development of those technologies.

In addition, our colleagues at the ministry of natural resources and wildlife have programs to encourage the development of those technologies. We have also done that. We believe that the funds in budget 2017 will enable us to do more.

There is no joint program linking the two sectors, but there are still opportunities for collaboration between the forestry sector and the agricultural sector, particularly in terms of bioproducts and the bioeconomy.

● (1720)

Ms. Karine Trudel: Mr. Gray, would you like to add anything?

Dr. Brian Gray: Yes, but I will answer in English.

[*English*]

I just can't pull the technical terms off the top of my head, sorry.

We have just developed, in our branch, a clean technology strategy for the research that we have within our department. It's a small group, but we reached out to Natural Resources, to their forestry department. As you mentioned, biomass—whether it's left over from harvesting corn or from harvesting wheat—is something that could be used for energy. It could be used as a material for making autos, planes, or anything like that.

It's the same thing in the forest domain. Carbon is carbon, and plant waste is plant waste, so there is opportunity there for us to better collaborate and pool our resources and our smart scientists to work in these areas. That's something nascent. We are just beginning to do that.

[*Translation*]

Ms. Karine Trudel: Without going back to the earlier debate over the TPP motion, which was rejected, there are a number of trade agreements with other countries. It is important for Canada to promote environmental issues and talk about climate change so that the rules are fair for everyone in order to improve our environment.

What role does your department play in trade negotiations?

Mr. Tom Rosser: We play a role in negotiating international trade agreements. One of our colleagues is the chief negotiator for the agricultural sector. She is a regular participant in the negotiations, working closely with her colleagues at Global Affairs Canada. Yes, we play a role in the negotiation process. Under the North American Free Trade Agreement (NAFTA), and the vast majority of trade agreements, there is a chapter for the agricultural sector and a number of other sectors that are of interest to us.

Ms. Karine Trudel: Thank you.

The Chair: Do you have a quick question?

[*English*]

Do you want to ask a short question, or to call it a day?

Okay. Mr. Longfield, you wanted one question.

Mr. Lloyd Longfield: Thank you, Mr. Chair. That was generous of you.

I have a macroeconomic question. When we look at climate change.... One of your slides showed the changing area that would be more favourable for different pests as climate change takes hold, going into northern Alberta and the Northwest Territories. Do we have similar maps of how crop production could change in Canada? In the west, we have always been the wheat breadbasket of the world. With the changing growing seasons, there could be an economic change in the types of crops we grow. I know that in Asia a lot of wheat has come off the international market because of the rain that's now happening in parts of Asia, which didn't use to happen.

Do we have a larger risk analysis on the economics of climate change in terms of the crops that are produced in Canada, or is there an opportunity there?

Mr. Tom Rosser: Brian may be better placed to answer the question than I.

I would just offer two observations, Mr. Chair. One is that, over time, we do see significant changes in the crop mix in the country relative to 10 or 15 years ago. We see a lot more soybeans in western Canada. We have seen lower acreage in wheat over time and increased acreage in oil seeds. In part that just reflects market realities; in part it reflects technological advances and the ability to grow certain crops in different climates; and in part it probably reflects changes in growing seasons. I know there has been research done in this area. In fact, you see part of it in the deck that we shared with the committee, some thoughts and analysis of what a changing climate could mean over time.

I am not aware of specific analyses that answer your question at a global level, but perhaps Brian can offer some thoughts.

● (1725)

Dr. Brian Gray: We have very good information up to last year's crop on most of Canada. We have really good maps on acreage and the specifics of where it was, and they are in a geomatic format, at least for parts of the country. That's great information. What I tried to pick on page 14 is an area of zero-sum game growth within our group, namely, developing these forecasting maps. That's where we'd work with Environment and Climate Change Canada because they have one of the world's global climate forecasting models. We'd be looking at regional model development in partnership with them. That is part of our MOU so we can start doing the “what if” scenarios. For example, if the temperature is going to be this, we already have good information on soil so we know it's the right soil and that the temperature is going to change, those sorts of things, so we can start doing the “what ifs”. We really have to go back to the producers and ask what areas they're interested in expanding into. As Tom mentioned, a really good example is soybeans. We've seen soybeans just marching from Manitoba right into Saskatchewan.

The Chair: Thank you, Mr. Gray.

Thank you so much. It has been a long time to sit on the stand, as it were, so thank you so much for taking the time.

[*Translation*]

Thank you, everyone.

Have a good week in your ridings; we will see each other again on November 22.

[*English*]

Have a good week.