Food security, eco-friendly housing, a sustainable economy, and healthy environment…

La Trobe University teaching and research, focuses strongly on the needs of people and the planet.

One of the problems facing the world is the demand for food. We have dramatically increasing population numbers, we’re losing land to degradation, climate change is going to make all of that more difficult, so we have to find ways of modifying crops so that they can be more productive and require less land.

His plant biotechnology research team studies genes that regulate pollen development.

One way of increasing crop production is using something that is called hybrid vigour. And hybrid vigour is the crossing of two related lines within a species, and the first generation or two of that cross has increased productivity of about 30 to 40, or 20 to 30 percent.

At Victoria’s new $288 million AgriBio centre, Ben Cocks’ team made world headlines. They re-created the DNA of marsupial genes from 60 million years ago, in a global quest for new antibiotics for humans and the dairy industry.

It’s important to study agribioscience and the environment particularly to improve the competiveness of the Australian industry and on a more global level to be able to provide enough high quality protein to meet the protein and food demands of an increasing population in the world, and at the same time maintain a sustainable environment that food can be made in.So we’re interested in what makes animals more productive than others, on an individual basis and then using genetics information to understand important biological processes such as lactation and muscling.

La Trobe University has played a key role in Australia’s first Zero Emission House, north of Melbourne.

There are two parts to the technology, one is actually monitoring the energy from sensors, that’s smart meters and the other one is basically making sense of that information. Once that information comes through we have very intelligent smart technology that makes sense of that information. So we can basically see what the energy use is in real time, and also we add a cost to it, tariff and greenhouse gas emissions. We want to empower people to manage their own energy usage and they can only do that once they get the information in real time.

The Murray-Darling Freshwater Research Centre – which deals with the health of Australia’s largest river system – is a joint venture between La Trobe University and the Murray-Darling Basin Authority. It has major laboratories at the Albury-Wodonga and Mildura campuses.

The water resources are essential to the economic and social viability of all the communities in the basin and therefore if we don’t understand the way that ecosystems, rivers and wetlands and floodplains function, then we can’t make sure that they continue to receive the freshwater that they need. You battle away with something for a very long time and suddenly you develop a new insight into the way the world works and the way the environment functions, and that’s incredibly exciting.

For example, managing re-emerging wetlands after long droughts, to ensure plant and animal life returns to its former health.

We've decided to look at this because there has been some work done overseas that's shown that waterborne plant dispersal can be a pretty important factor for re-establishing aquatic vegetation at a site that has been dry. One of the main benefits is that it will help us select sites that have a good regeneration potential so that when we do deliver environmental water we are delivering it in places where it will be most effective.

Fish, of course, are also critical to wetlands. The Murray hardyhead has escaped extinction, thanks to the efforts of Iain Ellis

As a small bodied fishthey forage on zooplankton and small invertebrates, particularly mosquito larvae so they help control those numbers, those animals, and they're also a valuable food source for some larger fish that can survive in these saline environments and particularly for some of the birds that migrate and often breed around these saline environments. We’ve managed to salvage fish from seven different locations, which are all the known locations in which the species still survives and that’s important because we can then maintain the genetic diversity of this species across it’s current range which will really be beneficial for the long term survival of the Murray hardyhead.

So far around 300 fish have been released from the La Trobe University campus in Mildura back into the wild, in Victoria and South Australia. This is important, not just for the fish – but for people along the river, for the ecosystem, and our tourism and agricultural industries.