cutting-edge technologies and expertise required to comply with her request, the absolute need for multidisciplinary research to achieve desired results, and the disconnect that unfortunately exists between the agricultural scientists and researchers in other scientific disciplines.

Currently technologies used by agricultural scientists have mostly reached the limits of their capability in increasing food production and new genetic technologies need to be employed not only to produce higher yielding crops but, due to the impending climate change, new varieties that are also resistant to salinity, drought, flooding and biological infections.

The development of some of the new strains of food and cash crops will definitely require increased R&D expenditure and increased interaction and collaboration between agricultural scientists and scientists in other disciplines in order to build the required capacities and competencies in all relevant technologies (and not ICT alone).

Development activities in the agricultural sector do not have to wait till the new "super" crop varieties become available as new strains with some improved traits are being continually developed using currently used plant tissue culture and hybrid technologies. Unfortunately the high yielding rice varieties in cultivation today require inordinately large amounts of fertilisers, irrigation water and pesticides. Urea, the main fertiliser used, is produced directly from our valuable but limited supply of natural gas.

The pumping of irrigation water puts a strain on our overstretched electricity grid. Chemical pesticides and chemical fertilisers poison the land, waterways and the atmosphere. So for the production of the high yielding food crops we pay a huge price in terms of energy expenditure and environmental pollution.

It is thus essential to find and utilise alternative sources of energy and non-polluting fertilisers and pesticides. This can be readily initiated through widespread application of existing technologies that are already in sporadic use in Bangladesh. These technologies can be further improved and made suitable for commercialisation through R&D in our academic and research institutions.

Planned management of agricultural and household waste and setting up of village cooperatives could result in the production of adequate amounts of eco-friendly and nutritionally-enriched bio-fertilisers that would lessen the need for urea and therefore prevent unnecessary waste of our valuable natural gas reserves.

Micro-biologists and fermentation technologists in the academic institutions and research centres could carry out development research to improve the production and quality of the bio-fertilisers, and decrease the cost of production, to enable its large scale manufacture in rural areas.

Agricultural waste and unwanted vegetation (not food grains) could also become the source of valuable bio-fuels as replacement for expensive imported petroleum products. Already enzymatic and chemical processes have been discovered for the conversion of lignocellulose and other complex carbohydrates into alcohol.

Our own natural bio-diversity could be the source of even more effective enzymes for this process. This could be a very important area for post-graduate research and academic-industry partnership in Bangladesh.

Planned management of animal waste, and setting up cooperative production units in villages and around animal farms, could lead to adequate supplies of bio-gas for domestic use in rural areas and also for generation of electricity needed for the operation of irrigation pumps.

In this case also R&D in the academic and research institutions could lead to improved gas production at lower costs making it feasible to set up large-scale production units in rural areas.

Use of solar energy for electricity production has great potential in Bangladesh if the cost could be reduced. Currently used single occupancy units, which have brought limited electricity to areas that never had it before, are neither cost effective nor efficient. It would be much more efficient if solar panels on individual rooftops or in arrays in communal areas could be connected into local electricity grids.

The cost could be drastically reduced if the solar panels, which are currently imported and then assembled in Bangladesh, were fully manufactured locally. Bangladesh has the technical capability to do this.

In addition the development of cheaper and more efficient photovoltaic cells should be a priority area for postgraduate research in Bangladesh. Large-scale manufacture and assembly of solar panels and development of local electricity grids could not only electrify previously deprived remote areas but also relieve pressure on the national electricity grid. SME for the manufacture and assembly of solar panels could be established in rural areas all over the country thus creating much needed jobs.

The above are just a very few examples of how current technologies, supported by