STATEMENT by Dr. Richard Appledoorn

From what I can tell, the two sets of information, that from the Sea Around Us (SAU) Belize Fisheries Project and that from the Belize Fisheries (BF) Department are not really addressing the same thing. The SAU data is giving the situation as of 2020. Nothing from BF Fisheries is more recent than about 2013. I have looked at the conch data in the most detail since that is where my expertise and experience in Belize lie, but the trends are similar for lobster and many fishes. I will state that trying to determine the status of stocks from limited data is a bit of an art, but that in recent years there has been a lot of progress made to develop more reliable techniques. The SAU project was using one of the most up to date methods. It’s called CMSY++, which stands for Catch (based) Maximum Sustainable Yield, with the ++ signifying that it has been substantially enhanced and tested relative to its initial introduction into the scientific literature. Importantly, it does not rely on an assumption that the population being assessed is in equilibrium. Thus, the SAU analysis is very up to date both in data considered and methods used.

Interestingly, if you look at the time series of data (see attached poster for conch and lobster) the SAU data show that both species were in good shape through the mid 2010’s (given the size of the confidence limits), so it is only recently that serious overfishing has occurred. This is basically where the information obtained from BF stops (but note that the lobster assessment they provided argued that overfishing was already occurring). If this is really the most recent information (which I strongly doubt), they would be thinking that things were OK. But they really need to be open to these new and other recent assessments, and from what I have heard from others they are not too keen on listening. They also have been reluctant to share recent data and assessments (e.g., queen conch is supposed to be surveyed every couple of years). They have not reported conch landing to FAO in five years.

The method I used, both in 1996 and again in 2003/4 for queen conch strongly requires the assumption of equilibrium. This assumption was potentially reasonable in 1996 as the catches for the previous six years fluctuated around a reasonable mean value. This was not the case at all in later years where there was generally a trend in increasing catches, to very high levels today. Looking back, the method I used was one of the limited options available, and gave an estimate of MSY that is about ¼ of were current catch levels are. There were key assumptions I had to make in for this, and for most we had no way to assess how accurate our assumptions might be. For example, a key piece of information required was the average weight of processed conch meat. BF did not have this information but called one of the co-op operators for his estimate off the top of his head. I did not have strong confidence in our result, but at least it was something. However, the method I used no way compares with that used by SAU, so one should be looking toward that approach. This is not to say there are not questionable assumptions in the SAU approach, they have ways of controlling the range of values for these, which have been tested.

If BZ fisheries is still using my approach, the assumption of equilibrium is clearly not valid so the results will be invalid as well. Further, in my experience, there is no one in BF with any expertise in statistics, random sampling or analysis, so I would question anything they report that relies on these. That they are still using the same methodology from 30 years ago attests to this.

For conch and lobster, BF has set up what at first glance would be a reasonable approach toward management, which is based on tracking a number of indicators and adjusting the quota depending on whether these are going up or down. However, for conch at least, this was not well implemented. There are no mandates as how to adjust the quota, only suggestions that one might want to do that to some degree. Also, the indicators used are not necessarily conducive to maintaining the stock, or are based on density estimates from open and closed areas without a separate analysis between these to assess the impact of closed areas for stock stability, such as density of adults. I noted a lack of conch biology and assessment expertise in the working group that set up the management plan.

All of the above suggests that BF does not fully appreciate the good scienced that is being done for their benefit by a variety of NGO’s operating there. Maybe they are thinking their data says everything is OK, but there is cause to consider their assessment of the situation to be insufficient, for reasons I have mentioned above. At any rate, these are questions that could easily be settled if BZ would share their more recent information so that a consensus could be reached.