5.

Yield (Throughput Yield in this case) is defined as manufacturing output per unit raw material input over a particular time period. A 100% yield would mean a fully efficient manufacturing process. A reduction in yield, say to 90%, would mean that more materials would be required in order to maintain the same output as with 100% yield, hence the raw material and production costs for each chemical at each plant would be divided by 0.9.

Also since product is wasted, we can no longer assume that the production capacity at each plant is the same, the fall in yield also materialises as a reduction in production capacity by multiplying each plant’s capacity by 0.9.

6.

When making the recommendations on production, a number of other factors might also need to be accounted for as they all have some effect on production capacity and demand:

Sales projections: Similar to the projected 10% increase in demand from Asia W/O Japan in the case, the company’s sales team might have uncovered other markets (the rest of the BRIC’s for example), industries, or initiatives by current clients which could signal an increase in demand, and this should normally be taken into account to avoid potential undersupply due to underproduction. It can also indicate potential reduction in demand.

Competition: Increased competition (new entrants or alternative products) could reduce demand and therefore should be accounted for in forecasts. Likewise, the demise of a competitor especially when due to singular reasons, could sign a potential increase in demand from its previous clients.

Relative Inflation/Exchange rates: Inflation could have an effect on where to manufacture and supply to. All else being equal, countries which have a higher level of inflation would ideally be better manufacturing bases as their depreciating currency value would result in their exports becoming cheaper. It would also mean imports would become more costly for them, and would make it preferable to source goods locally and manufacture locally. Likewise, countries with relatively low interest rates would be more beneficial purchasers as they would prefer lower prices from the cheaper countries, possess a more stable currency and be able to pay more for the same goods.

Political turmoil/Natural Disasters: Unprecedented disasters in different countries/locations could adversely affect supply chains, resulting on consequences across the chain. Things like tornadoes, e.t.c. could drastically reduce production capacity, while political turmoil could also result in sanctions, civil wars, and reduce demand in the same way. Biopharma should therefore consider this, either through sourcing from multiple suppliers and/or slowly reducing dependency on potentially unstable countries.

Oil prices: Oil prices are a major component of supply chain costs. Being the major factor in virtually all means of transportation, changing oil prices would have an effect on freight transportation costs for Biopharma and their suppliers, and a possible subsequent effect on demand from oil producing countries.