Although India Has Embarked on a Laudable Journey to Become a Semiconductor Manufacturing Hub, It Has To Go A Long Way to Realize Its Ambitious Dream. Elucidate. (150 Words / 10 M) (GS-3 Industry)

Approach:

1. Introduction
2. Reason for India starting to take steps on semiconductor manufacturing.
3. Mention the recent example of semiconductor plant at Karnataka.
4. Mention some challenges.
5. Conclusion.

India's plan to become a ***semiconductor hub*** is one of the most ambitious and challenging tasks that the government has set to undertake. The world is immersed in the use of electronic devices – ***no microelectronic device that has no semiconductor chip***. Thus, this decision is a much needed priority if India wants to become self-reliant in semiconductor manufacturing.

Why India wants an indigenous chip industry ?: There is no choice but to become ***'Aatmanirbhar'*** for India because the ***global supply chain can snap for any reason***, including ***geopolitical***. Even, Overdependence on China, Taiwan and Vietnam is forcing America to return to chip manufacturing, regardless of cost. India's electronic sector saw unprecedented growth in the last decades with demands for e-gadgets skyrocketing. The demand has too scaled up in the aftermath of the pandemic. India have been heavily dependent on China for chips. But, during the pandemic induced lockdown, China began squeezing by shutting down its chip industry – as demand tremendously increased, the supply exponentially decreased.

A modest start: In this context, the recent signing of a ***MoU*** to house a ***semiconductor fabrication plant*** in ***Mysuru*** is a good development. The ***International Semiconductor Consortium Analog Fab*** has ***signed a MoU with Karnataka*** to invest **Rs. 22,000 crore in a 65nm analogue semiconductor fabrication plant**, about 5km away from Manda Kalli port. The stated aim of this project is to generate ***more than 1,500 direct jobs*** and ***10,000 indirect jobs***.

But it poses **few operational challenges**:

- It is a ***highly water intensive industry***. A chip manufacturing unit uses no less than ***2 million gallons*** of water ***per day***. Report says, nearly ***10 gallons*** of water are required to make ***a single computer chip***. This is very challenging, given the **dwindling water resource**.
- The **wastewater** generated is ***high in metal and toxic content***. So they must be ***processed*** before letting run-off. India ***lacks a clear guideline*** in regulating such instances to preserve environmental well-being. Most advanced establishments operate through ***robots to avoid pollution***, but given India's scale, ***using robots will render***

the sector economically & technologically unviable.

- It is ***highly capital intensive*** and requires ***strong R&D setup***, both of which India lags.
- Such technologies have ***higher failure rates***.

The ***pandemic and the Ukraine crisis*** have redefined the world order, forcing India to accelerate the ***Aatmanirbhar Bharat***. It has broken supply chains in many sectors. Given India can't relax anymore, its ***baby steps*** in the field are ***welcome***. But ***becoming a market leader is a distant dream*** for India. India must create a ***robust policy framework*** along with ***infrastructural bulwark*** to ***enhance economies of scale without compromising sustainability***, if it has to emerge as a decent player of the industry.