

Tech for Scarce Resources: Water, Food & Ag



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2022's cocktail of surging inflation, fracturing supply chains, and ongoing climate change effects conspired to shine a brighter light on the fragility of our current food system, which remains far from resilient and equitable. To put this into perspective, nearly one-third of the global population, more than 2.3 billion people, suffered from moderate or severe food insecurity last year.

We need to do better, and we can, by being more purposeful, collaborative, and forward-thinking. Sufficient access to food and water is a basic universal right and necessity, and hope attaches to necessity's role as the mother of invention to bring us closer to a more equitable future. The food and ag sectors are increasingly unveiling and deploying promising new technologies that can ameliorate the systemic issues that will only deepen amidst a backdrop of long-term demographic shifts and climate change-related planetary stresses:

- *Alternative Protein:* The rise and evolution of the alternative protein industry is one major technological trend to monitor. The most recent phase saw companies like Beyond Meat and Oatly (LionTree invested pre-IPO) become standard-bearers of the plant-based movement that grew significantly in recent years, and while there has been some growth moderation in the past year, there are companies like Neat Burger (LionTree investment) entering the market to energize the sector.
- *Cultivated Animal Protein:* Don't count out the plant-based movement yet, however do keep your eyes on the cultivated meat industry in the next several years, as UPSIDE Foods recently became the first company to receive the U.S. FDA "green light" for cultivated meat production. This technology effectively uses bioreactors to grow real animal cells instead of requiring slaughter of live animals, and the FDA stated they are actively engaged with a number of other firms regarding new technologies. We see high potential for continued growth in the alternative protein industry, and welcome other advancements in precision fermentation, mycelium, and insect-based proteins in the sector.
- *Indoor Farming:* Another key category that has attracted significant investor dollars is indoor farming. Companies such as Plenty, Bowery, Soli Organic, Iron Ox, and others are leveraging developments in automation, lighting, HVAC, and other technologies to optimize greenhouses and vertical farms. The promise of a more sustainable system that uses less land, water, and chemicals in more proximate locations to end-consumers is riding on the further scale-up of the industry.

In addition to growth in consumable products, the application of advanced technologies and techniques developed in other sectors holds great potential. One emblematic company is Gro Intelligence (LionTree investment), which combines sector domain expertise with modern data science, AI and predictive modeling techniques to offer a powerful data and analytics platform that helps various food system constituents make more informed decisions and mitigate risks. Embracing additional digitization, automation and robotics, fintech, and other technologies will move the industry forward.

Our current food system is also inefficient when it comes to waste and the downstream effects on our planet. By 2050, not only will we need to feed nearly two billion more people, but we will also see more plastic in our ocean than fish at our current rate. Footprint (LionTree advisory client) has developed plant-based fiber alternatives to plastic packaging that are compostable, biodegradable, and recyclable. In another example of LionTree's focus sectors converging, Footprint has partnered with the Phoenix Suns in a manner that goes beyond naming rights to use the stadium as a de facto lab to transform the way sports and entertainment is done from a waste perspective.



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As we enter 2023, we see tailwinds presented by secular growth in robust technology trends such as digitization and AI/ML adoption, as well as ESG-oriented investing strategies. However, headwinds will not be trivial, as companies need to navigate lingering macro uncertainty and dislocated capital markets. This trend juxtaposition will magnify the differentiation in capital-intensive sub-verticals such as cultivated meat and indoor farming, where we have already seen examples of rationalization amidst the tight market conditions. Investors will be ever-more scrutinizing on the fundamental merits of companies' underlying technologies, business models, and unit economics, while those competing for capital will also increasingly face classic industrial scaling issues as they mature, such as capacity expansion, QA/QC, and distribution to end-customers whose tastes are not static.

In a bifurcated market of haves and have-nots, we expect those able to solidify capital formation to consolidate opportunities, including companies, as those unable to raise sufficient funding in a tight capital market will increasingly be looking to engineer an outcome for their investors and employees.

And while both private enterprises and governments are clearly integral actors to help spur a more resilient and equitable food system, so are we, the consumers. We should be more conscientious about the deficiencies in the current system, and more purposeful in how we consume and mitigate our waste profiles.

