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Green Space – Can Space Deliver a New Green Deal?

In this month's technology topic/posting we explore the potential for a space enabled global New Deal as a mechanism for post pandemic economic recovery.

There are particular parallels between our present situation and Franklin Roosevelt's \$50 billion dollar recovery plan.

The economic and social devastation caused by the stock market crash of 1929 was compounded by three waves of drought through the 1930's triggering massive dust storms which forced tens of thousands of settler families to abandon their homesteads. Drought and erosion created the Dust Bowl, 100 million acres of land centred on Texas and Oklahoma and misery for millions of Americans. Unemployment rates headed towards 25%.

Roosevelt became President in 1932 in a Democratic landslide built on the promise of a New Deal Plan which would become increasingly dominated by reforestation, soil recovery and state and national park programmes organised through a Civilian Conservation Corps which at its peak employed three million men who between them worked for five billion hours. To all intents and purposes, even when road building and dams are taken into account, this was a \$50 billion Green Deal which involved the planting of two billion trees, the improvement of existing forests and the creation of 800 new state and national parks.

Conveniently for Roosevelt, the need to invest in the traditionally Republican strongholds of Middle America and the West consolidated the Democrat's hold on power. FDR was the only President to win four terms, dying in office in 1945. He was succeeded by his running mate Harry Truman who served as President for another eight years (two terms) when he was replaced by the Republican, Dwight D Eisenhower who became the 34th President. The Deal, and subsequently the Second World War had therefore kept the Democratic Party in power from 1933 to 1953.

Not everyone would want our present political parties to be in power for the next twenty years and a Third World War would definitely be a bad idea but there are lessons to be learnt from the 'dirty thirties'

The three natural threats to forests are fire, insects and disease. One of the first jobs of the Civilian Conservation Corps was to install 88,000 miles of telephone line between 3116 newly constructed fire towers. This was combined with aerial surveillance which was used to map and monitor existing forests and the growth of new timber stands. Aerial imagery was also used to monitor and manage agricultural good practice, for example the implementation of contour ploughing. As the soil improved, crop yields increased. Land value increased which meant that farmers could borrow to fund further improvements.

This was mainly urban labour implementing a mainly agrarian revolution, largely through manual work but with useful technologies to hand.

Fast forward ninety years and we can observe that by and large we have been spared 1930's scale dust storms but are still faced with global agricultural and environmental challenges.

In many parts of the world, agrarian economies are still at or close to subsistence level. Deforestation in the Amazon, making up over half of the world's rain forest, is running at record

rates. Cattle farmers in Brazil are responsible for 80% of the deforestation in the region and account for 14% of the world's annual loss of tree habitat.

'High revisit' satellite imagery from CubeSats or other high count LEO constellations are a key weapon in the monitoring and management of our global and environmental assets both on land and at sea. [Relatively low cost CubeSat constellations](#) are capable of building a daily picture of the world's land mass and water mass.

Higher resolution imaging across the visible and infra-red bands has also helped support new applications. The European Sentinel 2 constellation for example has two satellites at an orbit height of 785 kilometres. With an overfly every 5 days at the equator and two to three days at middle latitudes, this is not high revisit imaging but provides an effective way to track animal populations including [penguin colonies in the Antarctic](#) providing data for environmental trend analysis.

On a national and regional scale, next generation high count LEO constellations such as [OneWeb](#), [Starlink](#) and [Project Kuiper](#) promise to deliver rural connectivity at a fraction of the cost of terrestrial networks, connectivity that can be used to deliver education and medical and health and hygiene expertise. [Amazon Web Services](#) is investing in ground stations which allow third parties to add value to [environmental data from space](#) alongside many other [innovative companies with business cases built on multi use satellites](#). This includes revenue streams realised from [low carbon footprint \(more efficient\) supply chains](#)

[The ESOA even make a credible case that rockets and satellites are part of a new era of Green Space](#). The use of liquid hydrogen and liquid oxygen for boosters means at least this part of the power train just generates water. Modern solid propellant rocket stages have only about 10% of their mass as oil based binder. The other products from the aluminium and ammonium perchlorate combustion process get rained out. A Boeing 707 flying from London to New York, uses the same energy as an Ariane 5 rocket launching multiple satellites into space with a life of 15 years of solar powered life ahead of them.

These green credentials could of course be damaged by a major space debris event. You would hope however that BP's experience over the ten years since the [Deep Water Horizon Oil Spill](#) which so far has cost the company at least \$70 billion dollars would be a cautionary tale. Making a mess in space is going to be at least as expensive as a maritime or terrestrial environmental accident.

So can space deliver a new Global Green Deal?

This is all depends on politics.

For FD Roosevelt, an unprecedented level of money spent on the environment delivered an economic recovery and twenty years in power.

But that was a national story. This time round similar amounts of money need to be spent but much of it should be spent in the areas of the world which are going to be the hardest hit. This would require a staggering increase in overseas aid and this has never been a vote winner.

The satellite industry could however make a difference and show that relatively modest investments in connectivity could produce disproportionately large economic, social and political gains in the longer term.

By 2050 the population of Nigeria is forecast to be 400 million, overtaking the United States as [the world's third most populous country](#). Covid and cholera could of course dent that number but this rate of population growth represents a challenge and opportunity.

In the 1970's and 1980's Julius Nyerere attempted to implement an agrarian revolution in Tanzania which would have transformed the country's agrarian economy from subsistence to surplus. The project failed due to internal resistance and unhelpful foreign intervention.

Nyerere also had a [philosophy of education](#) and [political reform](#) which was ahead of its time but if implemented locally and across Africa would have transformed the African economy and body politic. His political philosophy included a major reduction in economic inequality and in this he was at least partially successful. Today, Tanzania has the lowest gap between the rich and poor of any African nation. It has also been the most political stable country in Africa which is not a coincidence.

Forty years later agrarian and environmental investment coupled to education (which reduces economic inequality) is the fastest way out of the mess we are in. Satellites cannot plant trees but they can be a key part of a new global Green Deal which can deliver a happier and healthier future for us all.

Ends

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