Conservation Problem with Invasive Species.

Invasive plant and animal species have been introduced into most areas of the world. Either purposely or by accident. If they have few natural enemies they may become invasive and begin to take over from indigenous species, which have established a balance over thousands of years, upsetting the ecological balance of large areas, reducing resilience of ecosystems and therefore the sustainability of ecosystems to supply services.

In the Fynbos biome of the Western and Southern Cape of South Africa species were introduced from Australia to stabilize sand dunes along the coast. They worked very well in these areas, but have migrated out of these areas into the main Fynbos biome and have outcompeted the indigenous species and in many areas. They have replaced the indigenous species completely, forming dense stands. A project to remove these species was initiated a few decades ago which cost millions but was seen as providing work for thousands of people. Some success was achieved with this project but it failed to halt the spread of these species and a lack of follow up treatments except for isolated small areas has led to the problem spreading and becoming much greater. The government has declared most of these 'alien invasive species' and legislation has been put in place to force land owners to clear these alien species, but this legislation is hardly ever applied and the worst areas are usually government owned land. With the massive corruption from the very top of government, and which has filtered down to the very local level, the government of the country has run out of money to do anything about the problem except small areas of declared nature reserves.

The scale of this problem has become massive and 60 to 90% of the devastating Knysna fires in 2017, which destroyed infrastructure, (several billion Rands), and caused 7 deaths, could have been avoided if clearing of the invasive species had continued in the last decade. The problem is mainly that many of the invasive species burn with 7-10 times the fire intensity (because of the much higher oil content) than the indigenous Fynbos species and that the invaded areas usually have 2-3 times the fire load because they grow quicker and larger than the indigenous species.

The invasive species also use up much more water than the indigenous Fynbos causing a much drier environment and therefore more fire prone. The Cape Town water crisis, where the city nearly ran out of water, was compounded by the spread of these invasive species into the catchment areas of the dams supplying Cape Town. This has been estimated at 20-30% of the water crisis. The cost to the economy of the city of Cape Town runs into the billions of Rands, mainly to agriculture which eventually had water supplies cut off or severely reduced. Most of these costs are to private landowners and certainly not to the politicians who failed to heed the warnings of the scientists of the looming disasters of fires and water shortages.

The main constraints to the problem of much higher fire risks and major reductions of water availability, in what is already a dry region, are a lack funding from central government, which is still corrupt. What funding is available is being misspent by inadequate control measures which are short term political measures. Politicians have a very short time horizon and ignore the long term time horizon. Just the costs of the two disasters of the Knysna fires and the ongoing Cape Town water crisis exceed the costs of the control measures needed to have brought the problem under control. The reports produced by the forensic investigators, government officials and even the Council for Scientific and Industrial Research, CSIR on the Knysna fires focussed on the course of the fires and not on the reasons why they were the most devastating fires we have ever had in SA. The Cape Town water crisis management is focused on the short term water management and has not even included budgeting for the clearing of catchment areas, which would considerably increase long term water flows and rejuvenation of artesian water, a long term project.

Much of the focus is on short term thinking and avoiding responsibility for long term focus which will reduce recurring disasters in the future. Current assumptions are focused on returning ecosystems to some 'pristine' normal which no longer exists. Lip service is paid to some new normals in terms of climate change. Many areas including wetlands have been apparently abandoned, especially areas in close proximity to built-up areas. The current drought and short term focus ignores the potential flooding which will occur in a wet year especially the ability of wetland areas to mitigate flooding. The Fynbos biome which has the richest species diversity of any of the world biomes is been reduced to a handful of species. In my area within about 5000ha there are more indigenous plant species than the whole of Britain. The costs of recovering species diversity have climbed to unacceptable heights.

The dominance of exotic invasive species within much of the Fynbos biome needs to be accepted as a continuous scenario for the future as it will not significantly change. We lost the battle when cash was available and for the foreseeable future cash will not be available to change this. The time has already arrived for a rethink on management practices to hinder the continued spread of these species and to come up with new management practises for the areas that already contain significant numbers of these exotic species.

A great deal of research already exists within the literature of how to better manage these invaded areas, which was done with the old assumptions that we would eliminate these exotic invaders, but gives us great pointers on how we can change future management practices to control these species. Unfortunately, most of the scientific community and government officials have not really adjusted to the reality that the problem cannot and will not be removed. The current situation of ignoring the problem, primarily because of lack of finances and an inability of current structures to change with the future, is compounding the problems. In many areas this has reached the tipping point already.

The use of fire strategies, better and more balanced views on plant competition, the commercial use of products from these species, the gains in terms of soil stabilisation from these species and the acceptance that these species are going to be with us for the foreseeable future, must lead to rethinking the problem. This will lead to better management guidelines for the future where new norms will then be established to lead to more stable, biodiverse, sutainable and resilient species mix (although changed from the 'pristine' normal of the past), with reduced fire risks and reasonable water productivity from catchment areas.

Time for change is already in short supply and the policies of the past which have not worked need to change soon. This will make the limited budgets for the future extend further towards a realistic future and also reduce the risks of costly disasters from fire, drought or floods in the future.