THIRSTY INVADERS

THE IMPACT OF INVASIVE ALIEN PLANTS

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September is Arbor Month in South Africa and whereas South Africans are ordinarily encouraged to plant trees for environmental reasons, emphasis needs to be placed on the introduction of indigenous, environmentally friendly trees. The opposite applies though when it comes to invasive alien plant species that have for many decades, and continue to, have a devastating impact on the environment and the economy.

Invasive alien species are plants, animals and microbes that are introduced into countries, and then out-compete the indigenous species, impacting not only a country's economy, but biological biodiversity too.

South Africa faces a constant battle with invasive alien plants (IAPs) that pose a direct threat to the country's water security, biological diversity, the ecological functioning of natural systems and the productive use of land. They intensify the impact of fires and floods and increase soil erosion. IAPs can divert enormous amounts of water from more productive uses and invasive aquatic plants, such as the water hyacinth, affect agriculture, fisheries, transport, recreation and water supply.

Of the estimated 9000 plants introduced to this country, over 200 are currently classified as being invasive. It is estimated that these plants cover about 10% of the country and the problem is growing at an exponential rate.

According to the 2016 World Wildlife Fund's (WWF) publication 'Water: Facts and Futures – Rethinking South Africa's Water Future', a staggering 1.44 Billion m^3 of water is lost annually to alien invasive plant species in South Africa. In context, this amount of water could sustain 3.38 million households of four people for a year or 120 000 hectares of cropland for food production over a 12-month period.

The WWF publication describes these unwanted guests as 'the thirsty invaders' and for good reason. Invasive alien trees and shrubs often use more water than surrounding indigenous vegetation and this lowers water availability by up to 4%. If left to spread uncontrolled, this figure could escalate to around 16%. Invasive alien plants can dramatically reduce available water resources, with significant impact on stream flows, and the associated increase in siltation and degrading water quality.

Whilst these statistics demonstrate the impact of alien invasive plants on how much water is lost, the 2012 CSIR Report, 'Impacts of invasive alien plants on water quality, with particular emphasis on South Africa', highlights the severe impact that alien invasive species have on the quality of water in the country.

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WHAT IS BEING DONE?

South Africa's National Development Plan is clear about the need for change in the management of our natural resources. The expansion of formally protected areas, the implementation of ecological reserves and wider support for conservancies and stewardship programmes will all play a role in improving protection of our water resources.

The fight against invasive alien plants is spearheaded by the Working for Water (WfW) programme, launched in 1995 and administered previously through the Department of Water Affairs and Forestry and now the Department of Environmental Affairs. This programme works in partnership with local communities, to whom it provides jobs, and also with Government departments including the Departments of Environmental Affairs and Tourism, Agriculture, Trade and Industry, provincial departments of agriculture, conservation and environment, research foundations and private companies.

Since its inception in 1995, the programme has cleared more than one million hectares of invasive alien plants. WfW currently runs over 300 projects in all nine of South Africa's provinces. Scientists and field workers use a range of methods to control invasive alien plants that include: mechanical methods such as felling, removing or burning invading alien plants and chemical methods using environmentally safe herbicides.

Since 1913, biological control agents have also been used to target invasive alien plants in South Africa. This involves the use of species-specific insects and diseases from the alien plant's country of origin. To date 76 bio-control agents have been released in South Africa against 40 weed species. The result is that 10 invasive alien plants species are now classified as being under complete control and a further 18 under substantial control. It has been estimated that biological control of invasive alien plants saves South Africa approximately R6.5 billion annually in ecosystem benefits (water, grazing and biodiversity).

While not all of the agents have been successful, the positive results and benefit-to-cost ratio of biological control of invasive alien plants justifies continued effort being spent to develop additional agents.

An integrated approach that combines two or more of the described control methods is sometimes required to prevent enormous impact on an environment or community.

The Working for Water programme is globally recognised as one of the most outstanding environmental conservation initiatives on the continent. It enjoys sustained political support for its job creation efforts and the fight against poverty.

In addition, several policies and strategic plans highlight the importance of clearing invasive alien plants.

The 19th Strategic Integrated Project, introduced in 2014 and known as 'SIP 19: Ecological Infrastructure for Water Security' seeks to make a significant contribution to the overall goal of ensuring a sustainable supply of fresh, healthy water to equitably meet South Africa's social, economic and environmental water needs for current and future generations.

The National Water and Sanitation Master Plan launched in November 2019, once again highlighted the threat that invasive alien plants pose to South Africa's water security. The plan goes on to outline actions necessary to continue the fight against the proliferation of these unwanted plant species.

Opportunities from Biomass Beneficiation

Whereas the removal of invasive alien species primarily seeks to unlock significant amounts of water, a highly valuable by-product presents itself in the form of biomass beneficiation. Biomass beneficiation offers several significant advantages to the economy, the environment and has far-reaching social impact. It has potential to create new manufacturing and jobs in the biomass beneficiation application sectors.

Some of the opportunities presented by biomass beneficiation include: increased recognition of mulching as a water-saving device; composting based on the biomass of invasive plants; and specialist soil augmentation products, such as customised compost and activated charcoal, as soil additives that significantly increase agricultural yields and build sustained quality of soil that is leached by over-fertilisation and innovative animal feed comprised of the cellulose of invasive plant species.

Wood-based opportunities include: logs and wood chips that can be sold to local and international pulp and paper industries; logs, chips, pellets and charcoal can be used to generate energy; and timber and wood composite materials can serve as biomass-based building materials, as well as for the production of furniture.

Collaboration and Skills Development are Key

Successfully clearing invasive alien plants requires a systematic and continual approach. Those who understand the nature of the beast agree that clearing a single piece of land is pointless given the rapid rate at which the plants proliferate.

Partnerships are key to successfully managing invasive alien plants. These partnerships require a combination of the Government's limited resources, the extensive clearing and rehabilitation skills of thousands of small, medium and micro-sized enterprises (SMMEs) that have experience in the clearing of invaders, the forestry sector, as well as landowners and farmers' associations across the country.

The mechanical and chemical methods of controlling invasive alien plants are by their very nature extremely labour intensive. However, in a country where unemployment is rife, the implementation of projects to clear invasive alien species provides extensive employment opportunities and support for local communities.

Native to South America, bugweed is one of two of the most problematic alien invasive plants in South Africa. It has invaded large tracts of land especially in the high rainfall areas of South Africa, outcompeting and dominating native vegetation, reducing biodiversity and rendering the invaded land virtually useless. www.sanbi.org

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WfW considers the development of people as an essential element of environmental conservation and strives to create an enabling environment for skills training. Short-term contract jobs created through the clearing activities are undertaken, with the emphasis on endeavouring to recruit women (the target is 60%), youth (20%) and disabled (5%). To date, WfW has provided jobs and training to approximately 20 000 people from among the most marginalised sectors of society per annum. Of these, 52% are women.

The biological methods used to clear invasive alien plants, whilst more complicated and therefore the domain of individuals and organisations with the relevant training, knowledge and skills, present employment opportunities to qualified individuals for research, innovation and deployment of biological control agents.

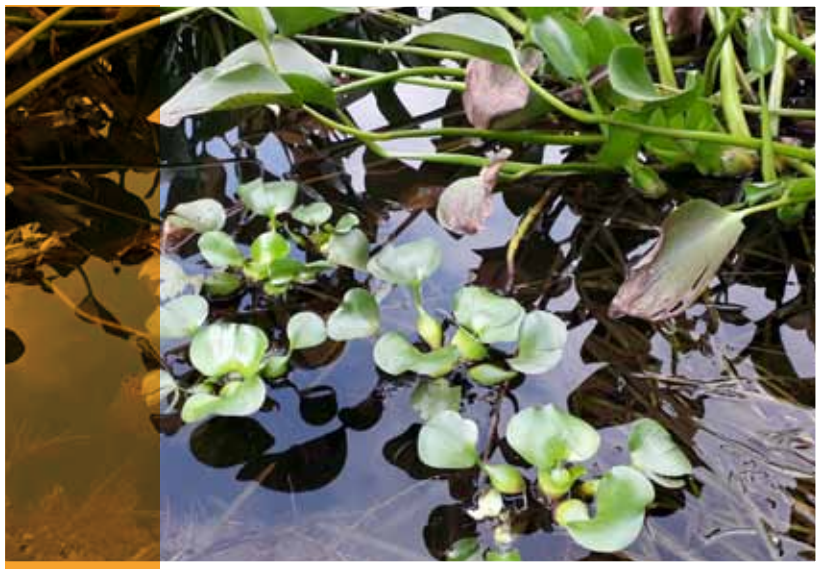
THE ROLE OF SMMES

The National Skills Development Plan (NSDP) 2030 is one of numerous strategies that have been developed and implemented in South Africa, where focus is placed on the important role of SMMEs in developing the economy and providing jobs.

According to Nora Hanke-Louw, Acting Water Sector Manager at the EWSETA: "The clearing of invasive alien plants is 'low hanging fruit' for SMMEs and in pursuing this business, the SMMEs are providing employment, boosting the economy, making a positive contribution to the environment, and very importantly addressing the water crisis in the country."

With this in mind, the EWSETA encourages young, environmentally conscious individuals who have entrepreneurial spirit to very seriously research the clearing of invasive alien species and biomass beneficiation as a viable business option in the hope that more young people will join the fight to protect our water resources.

" When one considers that South Africa faces a water deficit of 17% by 2030, combined with the fact that unemployment is rampant in the country, actively pursuing the clearing of invasive alien species and the added-benefit of biomass beneficiation, positions these activities as important contributors to South Africa's economy and water preservation," Hanke-Louw.



Water hyacinth is frequently branded as the world's worst aquatic weed due to its invasive potential, negative impact on aquatic ecosystems, and the costs associated to control it. Water hyacinth was first recorded in South Africa on the Cape flats in the early 1900s and since then, has spread throughout the country. This extensive distribution, as well as the resilience of the weed, is attributed to the highly eutrophic, or nutrient enriched, state of South Africa's waters, and has led to the severe degradation of a number or aquatic ecosystems. www.arc.agric.za

INFORMATION SOURCES

http://awsassets.wwf.org.za/downloads/wwf009_waterfactsandfutures_report_web__lowres_.pdf
https://www.environment.gov.za/projectsprogrammes/wfw
https://researchspace.csir.co.za/dspace/bitstream/handle/10204/5961/Chamier_2012.pdf?sequence=1&isAllowed=y

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