

Combating alien plants rooted in the heel of a dam: Injaka Dam

Modelling Camp - 2026

Tourism Sector

**Industry
Attraction**

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INTRODUCTION

- The Injaka Dam is situated in Mpumalanga Province, within the Bushbuckridge Local Municipality (Figure 1).
- It was initiated in 2001 mainly for relegation and domestic use.
- Formed by two rivers: The Mgwarijtjie River and the Mgwarijtjana River.
- The dam has the potential to be one of the province's top attractions, offering a range of water activities.
- 4000 Hectares, which includes the dam and buffer zone.
- Level-height: 35 meters.
- Capacity: 132 843 m³.
- However, There are alien trees (plants) underneath the dam (some of which surface above the water), which could cause serious damage to boats, etc.

Injaka Dam Map



BACKGROUND

Community involvement & engagement dynamic:

- The buffer zone surrounding the dam is 100% claimed by Injaka Watervaal Communal Property Association (CPA).
- The local community members were compensated for the Dam, but they hold title deeds for the buffer zones.
- Conducive for water sport facilities and activities such as fishing and boating.
- The Injaka Dam is a popular venue for bass fishing competitions hosted by the South African Bass Angling Association (SABAA).
- A decision to develop this area into a resort has been supported by management.
- The Resource Management Plan is in place.
- A Memorandum of Agreement is in place between the Department of Water and Sanitation (DWS) and Bushbuckridge Local Municipality (BLM) for the dam management.

BACKGROUND

Tourism development in South Africa is guided by the key principles of Responsible Tourism stipulated in the 1996 White Paper.

- South Africa is the first country to include Responsible Tourism in its national tourism policy, the 1996 White Paper on the Development and Promotion of Tourism in South Africa.
- Goodwin (2007) notes that Responsible Tourism is about “making better places for people to live in and better places for people to visit.”
- Responsible Tourism requires that operators, hoteliers, governments, local people and tourists take responsibility and take action to make tourism more sustainable.

Problem to Investigate

- Currently, there is a challenge with alien plants growing inside the dam rooted in the heel of the dam. These alien plants are a threat to the water activities currently taking place and potentially cause physical harm to competition participants or tourists using boats. In addition, it could jeopardise development and growth opportunities (**Focus for this week**).
- Secondly, there is a possibility of overtourism, which is regarded as congestion from too many tourists in an area or attraction, resulting in conflict with locals and impacting customer satisfaction. Solving this problem could translate to a green economy reaching local communities and contribute to genuine sustainable development (**tackles in the later stage – ongoing research**).

Problem to Investigate Cont.....

Building on these two points, the problem seeks to develop:

- i. A mathematical model to identify the alien plants and the best way to remove/control them at an early stage, and to optimise the conservation of life forms (fish) and tourism recreational activities (**Focus for this week**).
- A mathematical model to determine the maximum number of people Injaka Dam tourist attraction can take at one time (carrying capacity) to prevent overtourism. (**tackles in the later stage – ongoing research**).

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Thank you for listening!!
Let's Do Tourism

