



AUTHORS:

Thembela Mantungwa¹
L. J. Theo¹

AFFILIATION:

¹Media Department, Cape Peninsula
University of Technology, Cape Town,
South Africa

CORRESPONDENCE TO:

Nic Theo

EMAIL:

TheoLJ@cput.ac.za

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Sutherland big telescope: Further opportunities for effective science engagement?

Significance:

The launch of the Southern African Large Telescope (SALT) in 2005, and the introduction of astronomy outreach to interface with the general public, signified a turning point in South African astronomy. We conducted a small study to begin to understand the perceptions of the community that hosts the research facility in Sutherland, in the Northern Cape Province, South Africa. There is an ongoing need for good stakeholder engagement for sustainability. Scientists need critically to consider and review engagement processes with remote communities, including those flanking astronomy infrastructures.

Introduction

The South African Astronomical Observatory (SAAO) began its operations in Sutherland around the 1970s. The move to Sutherland came as a result of the light and air pollution which made it impossible for astronomy research to be done effectively in Observatory, Cape Town.¹ As a country trying to redefine itself in many aspects, including science, the South African government began building the Southern African Large Telescope – a 10-metre class telescope. The commission and launch of the Southern African Large Telescope (SALT) in 2005 marked a turning point in South African astronomy, when astronomy outreach was formalised by establishing the SALT Collateral Benefits Programme to interface with schools and the general public to justify the huge investment in astronomy.² The formalisation of astronomy outreach or astronomy engagement was buttressed by science and society advocacy dating back to the 1996 *Science and Technology White Paper* asserting a resolution to advance a South African vision of an information society to serve the needs of the country instead of reflecting those of other countries.³

During the launch of SALT, the SAAO hosted an inclusive event with the Sutherland community at the rugby stadium in town. This closeness and consideration created hope and huge expectations. These expectations were partially met by a focus on astronomy outreach, a form of communication that was intensified and codified in a SALT Collateral Benefits Programme.² Concomitantly, attention was paid to edu-tourism, which was hoped would play a significant role in public understanding and engagement with science⁴ and serve as economic fortification for the community, considering that tourism in South Africa and worldwide is deemed a catalyst for development linked to job creation⁵. From the community's perspective, the town of Sutherland would be visible for the first time, and there was indeed a tourism boom in the town with guest houses, and bed-and-breakfast establishments built in anticipation of the influx of tourists who would visit SALT and Sutherland as a centre of science and technology.

What exactly is missing?

A recent very small study on perceptions of people in Sutherland about the Observatory² suggests that the surrounding community may feel there is a distance between them and SALT and that there is not much substantive involvement in the town beyond school outreach programmes. Although outreach efforts are visible and active, according to participants, there is a lack of career pathing despite the firm stance taken by the South African Department of Science and Innovation (DSI) on the wide-ranging categories focusing on the promotion of careers in science⁶ and the National Research Foundation's (NRF's) mandate on the expansion of human and research capacity in the fields of science⁷. The Observatory thus far has trained and retained five young unemployed youth as tourist guides.⁸ Though encouraging, this is insufficient to meet the broader mandate.

The launch of SALT occurred in the context of the Department of Arts, Culture, Science and Technology White Paper, the vision of which was to establish a conducive culture for knowledge advancement appreciation as a vital component of national development. On the occasion of the SALT launch in 2005, President Thabo Mbeki said:

*The Observatory is a place dedicated to the pursuit of knowledge. Its sole purpose is the discovery of the unknown, and therefore the further liberation of humanity from blind action informed by superstition that derives from failure to fathom the regularities and imperatives of the infinite natural world.*²

Preceding both the SALT launch and the 1996 White Paper, was a year-long science engagement campaign to reignite South African society's interest in science.³ Entrenched social segregation as a result of colonial and apartheid political systems, and dependence on science practices developed in the Global North, may all have contributed to a less than ideally locally inclusive approach to science communication.⁹

Against this backdrop, we were interested to hear the views of the Sutherland community on the SAAO, and we conducted a small-scale study to begin to address this question. Overall, participants reported an absence of community-based interventions and a lack of astronomy information.

Some of the themes that emerged from the data analysis highlight the perception participants had of the SAAO. It is important to stress that our sample was very small (seven people); nevertheless, the views expressed shed some light on possible expectations and hopes for better communication and an improved relationship.

The problem of expectations

It appears that there were high expectations for the SAAO to provide substantial employment opportunities. Some non-professional positions were filled by Sutherland people during SALT's construction and afterwards as general workers. Given the very limited capacity created by the Observatory in anticipation of SALT, professional appointments would have been impossible. Some participants mentioned the importance of meaningful school outreach programme beneficiation through career-pathing so that in the future their community could have professionals employed by the Observatory: One participant said:

No, and most of the children really want to come back and work here at SALT but I think the last few years for three or more years they do not have mathematical teacher – its mos science and mathematics that must be your main subjects. A lot of them didn't have that or their grades wasn't that good. If SALT found something and they come and explain it maybe more of the children will be interested in astronomy.

The education benefit plan of SALT was to jointly form an SAAO and Northern Cape Education mathematics and science academy to attract young people from the surrounding towns.¹⁰ This did not fully materialise – in its place there is a mathematics teacher for both Sutherland schools. Hiring the teacher is a step towards addressing one of the strategic aims of the DSI science engagement strategy, which is to make science, technology, and engineering careers attractive to young people.⁶ There are examples of astronomical observatories, in better resourced contexts, that have anticipated the need for technologically advanced skills that would meet their workforce demands, for instance, the Thirty Metre Telescope in Hawaii initiated a 1-million-dollar fund to upskill the workforce in preparation for their next-generation telescope commissioning.¹¹

Disconnection from the community?

In preparation for the SALT launch, the Observatory made use of Community Development Workers from the Karoo Hoogland Municipality, who were responsible for information dissemination within the community. After the launch, there was no communication until FOKUS – an environmental and current affairs television programme which airs every Sunday on SABC2 – visited Sutherland and asked the community members about their knowledge of SALT. In response, the Observatory had a regular tour bus in town bringing community members to SALT. Because the Observatory is a national facility, government officials sometimes visit SAAO. In these instances, the Observatory also invites community leaders to attend. A participant in our study commented: “No, no there was no chance that they recognise us. They just recognise us when there's dignitaries coming.”

The desire for broad science communication

“Everybody is curious, they just want to go to the Observatory to see how the process is with SALT.”

Science often represents an important social good; therefore people ought to know about it. Some scholars argue that comprehension of science communication in a cultural context could help the public to be both analysts and practitioners.¹² During the interviews, participants spoke fondly about their pride in being located near a scientific institution like SAAO. They said that their proximity to the SAAO is a conversation starter whenever they are visiting family outside Sutherland. On the other hand, they expressed concern at the gaps in their own knowledge about astronomy. This, they said, makes it hard for them to engage meaningfully with tourists even though astro-tourism is the backbone of the unique selling feature of Sutherland.

The thriving tourism activity around the Observatory is evident in the numbers collected by SAAO. Sutherland receives 13 000 tourists per annum,⁸ directly benefitting the many guesthouses and B&Bs that cater to the niche tourism product coined ‘astro-tourism’. Astro-tourism is a

fundamental cornerstone of a socio-economic strategy aimed at driving tourism-led destination economic growth¹³, especially in the Northern Cape where astronomy infrastructure exists. Those who did not have the means to participate in the newly formed niche could benefit from a well-considered broad-based benefit focused on the tourism value chain.¹⁴ At the macro-level, tourism value chain means individuals, organisations, and businesses that form collaborative intersections to co-create and co-deliver a sustained value to tourists.¹⁵

The Observatory is an entity integrated into national science programming and a facility of the NRF, whose responsibility and mandate is to advance the “transfer of technology and the implementation of research results and findings”, part of which ideally should include making science knowledge broadly accessible.⁷ The Observatory is obligated to follow the policies of its funder, the DSI, which recognises that a major goal of science engagement is critical engagement between science and society in order to enable society to engage meaningfully with policy development, including the ability to question controversial scientific projects.⁶ The NRF and DSI mandates match science communication scholarship which underscores democratisation and public engagement.¹⁶

In order to engage substantively with the Science and Innovation Strategic Plan, which outlines the importance of revamping the general public's knowledge about science¹⁷, the Observatory's approach to communication should ideally be built on an acknowledgement that science does not have a firm foothold within the South African society, given the historical and contextual factors mentioned above.⁹ This requires strategic marshalling of communication as an influential foundation that sets up a stage from which relationships can be defined and disassembled.¹⁸ Whatever practical actions the Observatory may take in this direction, what is needed is an ongoing engagement with the tools of science communication that consider cultural context so as to help the public to be both analysts and practitioners.

Recommendations going forward

It is important to emphasise that our study was small; all recommendations must be tentative. Nevertheless, we hope this work will contribute to the debate in the field. There is an aspiration within the DSI policies and science engagement strategy to find ways to have a scientifically engaged society. Much has already been done, but in order to fulfil this mandate, there is a need for ongoing and reflective engagement between the SAAO and the community. Science communication and relationship building are ongoing processes rather than events; developing and maintaining a reputation for any enterprise requires ongoing work.¹⁹ The DSI encourages using corporate communication departments within the national science institutions to collaboratively develop coordinated messaging with researchers, science engagement practitioners, and scientists.²⁰

A particularly important feature of science engagement is with the youth. The science engagement strategy implementation plan from DSI recognises the importance of learner-focused intervention. As such, a policy framework specifically addressing skills development in science and technology in the communities in which astronomical observatories are located would be ideal. Currently, and understandably, the policy is very broad because it is meant for the whole country. The DSI clearly mentions in the implementation plan the importance of partnerships between willing universities and high schools. Given that Sutherland only has two schools that have recently acquired a mathematics teacher via SALT, the opportunity for such partnerships is ripe with possibilities to realise community aspirations of having “locally groomed astronomers, technologists, and engineers”. This would also create a pipeline for Sutherland learners to easily join other programmes such as the National Astrophysics Space Science Programme whose origins were to improve astrophysics skills in the country (2016–2021). Science communication strategies represent an important investment in the future of science in South Africa.

Competing interests

We have no competing interests to declare.

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