

# USING A UNIVERSITY'S INTELLECTUAL PROPERTY TO SPUR ON ECONOMIC DEVELOPMENT IN THE COMMUNITY SURROUNDING THE UNIVERSITY - A TRIPLE-HELIX RELATIONSHIP?

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## **Abstract**

*This paper describes a relationship involving the University of the Witwatersrand in Johannesburg (South Africa), the local and national governments and the business sector to utilise ecotourism as a means of economic development. The relationship was set up to exploit the palaeoanthropology knowledge base which existed at the university to the benefit of the community surrounding the area where this knowledge was being generated.*

*The university is a world leader in the study of hominine species because of a number of important fossil excavation sites which are situated approximately an hour's drive from campus. The first steps towards realizing the goal of benefitting the community was the joint Government and the university initiative to have the fossil sites declared as a World Heritage Site (WHS) by the United Nations in 2002. The National and Provincial governments and the university then explored various ways in which this WHS status could be exploited to the advantage of the communities.*

*According to Etzkowitz (2008) in the early stages of a Triple Helix relationship partners begin by playing their traditional roles. The university was producing the palaeoanthropological knowledge, the land owners wanted to improve the economic environment so that they could benefit from the influx of tourist and the government wanted to regulate these benefits so that they could be spread across a broader base.*

*This paper explores how this relationship between the university, the government and industry fits into the Triple Helix Model. The key aspect to be considered is the fact that the relationship was not planned to stimulate innovation in the normal sense, but rather to disseminate knowledge being generated at the university in an innovative manner to the person in the street and thus to garner further support for research in the field of palaeoanthropology. At the same time this was done to stimulate ecotourism into the area, with palaeoanthropology as the focus, thus bringing about economic benefits to the communities in the area.*

## **Introduction**

On the world stage, universities are being asked to compliment their traditional mission of teaching and research with a third mission of involvement in socio-economic development. Universities are "currently taking up a more fundamental role in society, one that makes it crucial to future innovation, job creation, economic growth, and sustainability" (Etzkowitz, 2008). Universities are also "seen increasingly as playing a pivotal role in strengthening the competitiveness of an area as a global region, based on the knowledge and skills these institutions generate" (Borrell-Damian, 2009). This paper describes a relationship involving the University of the Witwatersrand in Johannesburg (South Africa), the local and national governments and the business sector to use ecotourism as a means of economic development in an economically depressed area not far from the university.

The paper explores how this relationship between the university, the government and industry fits into the Triple Helix Model as developed by Etzkowitz (2008). The triple helix is a process by which academia, government, and

industry collaborate to create or discover new knowledge, technology, or products and services that are transmitted to intended final users in fulfilment of a social need (National Institute for Triple Helix Innovation, 2010).

Unlike traditional Triple Helix relationships, this relationship was not planned to stimulate innovation in the normal sense, but rather to support further research in the field of palaeoanthropology and to give the ordinary man in the street a better understanding of the research being done in the field.

The University of the Witwatersrand has been excavating in an area not far from its main campus since 1936. The area is richly endowed in fossils of the hominine species. Excavations continue to this day and finds now total some 500 hominids, making Sterkfontein the richest site in the world for early hominids with approximately 40% of the world's human ancestor fossils having been found in the area. The area where the excavations have been conducted is a rural area, about an hour's drive from the university. Most of the works has been concentrated in a cave system called the Sterkfontein Caves, which is owned by the university. Over the last 20 or so year's many of the university's researchers started exploring some of the other caves in the area which were situated on private farms. There are now about 30 excavation sites being worked on by university researchers.

Even though the work being done at the sites was receiving world acclaim, not many people were aware of this important work. The university did not have the financial capacity to publicise the work more widely than in the regular scientific journals and another factor was that the majority of the people in South Africa have a very solid Calvinistic upbringing and the topic of evolution was not something that could easily be discussed. So we were sitting with a situation where we had an area which was world famous amongst scientists, but not that well known by the general public who were living close to the sites or were within driving distance from the sites. Coupled to this was the fact that the area was an economically depressed one with a net migration out of the area.

### **Why was there a need for a partnership?**

A number of interested parties agreed that there was a possibility that the world famous research being done in the area could be used to turn the economy of the area around. It became apparent very quickly that there were three important players in the area. There was the university which was producing the palaeontology knowledge, the land owners who were looking for economic benefits from the fossils that were being found on their properties and the government who wanted to regulate these benefits so that they could be spread across a broader base i.e. the surrounding communities. There was already a relationship between the university and the land owners (representing the industry strand of the triple helix), the university and government and government and landowners, although the latter was not that well developed.

Thus the relationship started out in the traditional mode as described by Etzkowitz (2008, p8) "*A triple helix regime typically begins as university, industry, and government enter into a reciprocal relationship with each other in which each attempts to enhance the performance of the other*". At this stage each strand was preoccupied with its traditional role. The university was producing the knowledge, the business partners were worried about wealth generation and government was interested in normative control.

What transpired over the next few months was that some of the traditional roles of the partners got to be shared by one or other partner, which started to make this partnership take on the characteristics of a true Triple Helix relationship. But traditionally Triple Helix relations also possessed another key ingredient, that of innovation. Did this relationship lead to innovation? To be able to answer that question we first need to look at some definitions of innovation.

*"Innovation . . . is generally understood as the successful introduction of a new thing or method . . . Innovation is the embodiment, combination, or synthesis of knowledge in original, relevant, valued new products, processes, or services."* Luecke and Katz (2003).

"... the multi-stage process whereby organizations transform ideas into new/improved products, service or processes, in order to advance, compete and differentiate themselves successfully in their marketplace." Baregheh et al. (2009).

"All innovation begins with creative ideas . . . We define innovation as the successful implementation of creative ideas within an organization. In this view, creativity by individuals and teams is a starting point for innovation; the first is necessary but not sufficient condition for the second". Amabile et al. (1996).

" .... Innovation is the process that translates knowledge into economic growth and social well-being. It encompasses a series of scientific, technological, organisational, financial and commercial activities. ..."  
[www.arc.gov/general/glossary.htm](http://www.arc.gov/general/glossary.htm)

From this we see that one of the outcomes of innovation would be a new product or service and for this to occur creative processes are required.

Now if we use this as our basis for understanding the process of innovation what happened in this partnership could be classed as innovation in that a new service was planned to be introduced which would help to differentiate the geographical area as a special area for ecotourism. What we will see unfolding is not the creation of a new product in the traditional sense, but rather something which was created to communicate an area of science to the general public in a way which was fun and easily understood.

Now that it looks like all the key ingredients for a triple helix relationship are in place, let's look at how this relationship developed.

### **How did the partnership develop?**

The university's main excavation site – the Sterkfontein Caves (where 40 percent of all the world's human ancestor fossils have been found), was already know as a tourism destination, more for being an accessible cave rather than for being a site for some the world's most famous human ancestor fossils. People in the surrounding areas were not seeing any economic benefits from the tourism traffic being generated by the caves. It was felt at the time that the number of people visiting the caves needed to be increased, and there needed to be a simultaneous introduction of an educational programme which would make visitors aware of the paleontological significance of the area. There also needed to be spin-offs for other tourism offering in the area. As caves are very sensitive environments, a large influx of visitors would disturb the ecological balance inside the caves, there was a limit to the amount of visitors that could be accommodated. The increase in the number of annual visitors would on its own not have been the driver needed to stimulate economic development in the area. The caves were already receiving about 60 000 visitors on an annual basis and the maximum number of visitors that could be accommodated was set at 100 000. Also, as mentioned earlier, the main reason for visiting the caves was not for paleontological reasons but rather as a traditional caving trip, an alternative had to be found to attract more tourist than that which could be catered for at Sterkfontein. The existing tourist also tended not to spend any time in the surrounding areas as there were either very few attractions available or they were not marketed adequately. Another way in which numbers could be increased was to open up some of the other excavation sites, after all there were about thirty other sites available. The scientists were not keen on this proposal as all their sites were very sensitive to increased human volumes. This is where innovation stepped in.

What was needed was some sort of clustering of activities and attractions in this economically depressed area to, "stimulate cooperation and partnership between communities in local and neighbouring regions ... (to) serve as a vehicle for the stimulation of economic development through tourism" (Briedenhann and Wickens 2004, p. 72). There was a need to package all the tourism offerings in the area into some sort of a coherent package using the theme of human ancestry as a common bond.

Meyer (2004) has shown that well designed tourism routes that have a very strong central theme can generate positive spin-offs. According to him, some of the important spin-offs are the more widespread of the economic benefits through the area by developing tourist facilities, activities and services along tour routes in a manner that will facilitate tourist spending at these stopover points; providing additional income to the residents of the area through employment by local facilities and services that are required to operate the route and to extend the average length of stay of tourists, or encouraging repeat visits, by providing a variety of attractions and activities.

Etzkowitz and Ranga (2010) contend that knowledge-based regional development via Triple Helix relations requires what they call "Triple Helix Spaces" and they argue that these three components in such spaces: Knowledge, Innovation and Consensus Spaces. According to them "an essential condition for the creation and consolidation of the Knowledge Space is the existence of a 'critical mass' of academic research and education resources on a particular topic in a local area, as well as other R&D and non-R&D actors" (p12). In the case under investigation, it was accepted by all parties concerned that the university possessed the 'critical mass' of knowledge and research capacity, what was missing was the other R&D and non-R&D actors. As we were working in the area of palaeoanthropology, which is a very specialised field, there were no other R&D actors that could be brought onboard. What was needed was input from non-R&D actors, who could package the knowledge in such a way that it would be attractive to the man in the street. The Innovation and Consensus spaces were provided in the form of a "Project Steering Committee" which initially had representation from university and government structures. Once an industry partner was found (through a tender process), it also had representation on this committee.

The attractive packaging of the knowledge had to be such that it would get people to visit the sites of all these discoveries, to see some of it for themselves. For the existing landowners (and potential new investors), there needed to be a clear indication that large investments were being committed into the area. This would give them the impetus and confidence to invest in their own ventures. The university was not in a position to supply the funding, nor did it possess the expertise to package the material in a fun and novel way. So, the idea was to create some sort of a tourist attraction based on palaeoanthropology which could then be incorporated into a number of tourist routes which would then benefit the local population.

According to Rogers (2007), international experience across tourism routes in both developed and developing countries has shown that the success of a tourism route necessitates a number of key preconditions. In particular he has identified five factors as particularly significant ingredients for success:

- Cooperation networks, regional thinking and leadership
- Product development, infrastructure and access
- Community participation, micro-enterprise development and innovation
- Information and promotion
- An explicit pro-poor focus

Most of these ingredients seemed to be present in the situation under investigation. The university, provincial and national leadership were ready to cooperate, the government was prepared to commit to massive infrastructure developments while most of the land owners were supportive of the initiative. What seemed to be lacking was an explicit pro-poor focus.

A partnership was entered into between the university, the government and industry to develop a Visitor Orientation Centre in the WHS not far from the caves. At the same time the plan also included an upgrade to the Exhibition Centre at the caves (to enhance visitors' experiences) and to provide new working facilities for scientists working at the site. The idea was to use the two attractions as nodal points for larger tourism routes which could include some or all of the other offerings. In this way people visiting one or both of these attractions would benefit owners of other tourism offerings in the area and as a result the general quality of life in the area would improve,

In the early stages of this relationship (around 2000) the area had about 30 private ecotourism offerings, mostly catering for the conference and wedding markets. The price of land in the area was increasing at a rate much lower than the average for the province and the economy of the area was largely based on small-scale agriculture.

In a typical Triple Helix arrangement, a partnership was established between the university, the government and industry. In this case the government took on a role traditionally occupied by industry in that it committed \$22M for the capital works that were to take place on the two sites. The university played its traditional role in that it provided all the intellectual capital and a number of industry partners played the wealth generation and innovation role. The industry partners formed a group which was given a concession to run the facilities for a period of 10 years, after which the Visitor Orientation Centre would revert back to the province and the Exhibition Centre at the cave would revert back to the university. The industry partners also took on part of the university's role in that they had to work out how to take the new knowledge and make it accessible to the public. Originally, the key industry partner was a group whose expertise was in the exhibition and marketing arena, while other industry partners had expertise in areas like building management, catering, retail etc.

The university and the government also played a joint control function through an Exhibition's Committee which consisted of staff from the university and the government. This committee had to approve all exhibitions in the two centres. The government had a further control function in that they had to approve all new developments by other actors in the WHS. This meant that land owners in the area who wanted to offer ecotourism offerings in the areas now had to get approval from the relevant government department. Over and above that, all other land developments now had to meet strict heritage requirements. This ensured that developments in the area reflected on the significance of the area to palaeoanthropology research. The government also committed to build eight gateways at key entrances to the area, where SME's would have the opportunity to rent stall to sell various items to tourists entering or leaving the area. The items for sale would include craft products related to the paleontological discoveries in the area (produced by local residents) or various refreshment items (which in some cases would include home-industry products).

### **What were the outcomes?**

The Maropeng Visitor Orientation Centre has been built on a 100 hectare site, donated to government by one of the country's banks and the Sterkfontein Caves Exhibition Centre is located at the Sterkfontein Caves owned by the University of Witwatersrand. Maropeng a' Africa (Pty) Ltd (formerly the Furneaux Stewart GAPP consortium) was chosen as the concessionaire for this project. The developments at Sterkfontein Caves were officially opened by the Deputy President of the country at an event on 29 September 2005. The facilities at Maropeng were officially opened by the President of the country on 7 December 2005. The construction of the visitor centres, together with associated road and other bulk infrastructure provision has led to the creation of some 600 permanent and 1,200 temporary jobs (plus an additional 600 jobs for road construction). At present, the eight gateways have not been constructed, but informal trade has been encouraged at the sites earmarked for this purpose.

The concession was granted on condition that the concessionaire met certain labour targets at all times. Amongst these were that a certain percentage of people employed during the building phase had to be from the disadvantaged communities living within the WHS, and that once the facilities were functional, a percentage of all employees at all levels had to be from certain designated groups.

The idea of this partnership was for Government's investment to act as a stimulus for investment by other stakeholders in the area. Government's investment was channelled into the project in two ways. The first was to make a large capital sum available for the construction of the two attractions, while the second was the provision of services and infrastructure to stimulate private sector activity and investment through new tourism activities. This was done with the parallel idea of promoting SMME development and Black Economic Empowerment. This in turn was intended to stimulate new business activity in the area, to help increase visitor numbers into the area and

ultimately increase spending and associated positive consumer multiplier effects, including an increase in labour absorption and the creation of job opportunities for the local population.

At the time that the concession contract was granted, a Public Benefit Trust (PBT) was set up to establish, promote, protect, preserve and maintain the WHS. The idea was that the concession fee due to the university and the government for the next ten years would be put into this PBT. The PBT would provide financial support for scientific research, education and community development activities in or in relation to the WHS. The benefit to the university from this arrangement was that there would be an increase in funding to support an area of research at the university which would not normally receive generous donor funding and to give greater publicity to an area of research which would not have been possible under normal circumstances.

Some of the changes that have taken place in the area since the inception of the project are the following:

- The area's economy which previously most based on small-scale agriculture has been transformed and more than 60% of the COHWHS's economy was deemed to be in the tertiary sector in 2007.
- The province and the local authority made vast investments in the infrastructure of the area mostly in terms of roads and water supply. The provincial government alone has invested R250 million in roads and bulk infrastructure in the area. The area is now more easily accessible from the two nearest metropolitan areas.
- While the South African population grew at about 1,2% p.a. between 2001 and 2008, and the provincial population increased by 1,7% p.a., the COHWHS population increased by 2,2% p.a. during the same time, showing an influx of people into the area. This is not a significant difference, but is at least showing signs that people are not moving out of the area.
- From 2001 to 2004 (i.e. before the intervention) the COHWHS's economy grew at about 1,7% p.a. (while that of the province grew by 3,6%). The increase after the intervention (for the period 2004 to 2007) was 4.9% (while that of the province grew by 5.9%). This showed that the COHWHS growth was at least catching up with the rest of the mostly urbanized province.
- An independent (unpublished) study has found that the value of farms / smallholdings in the area grew approximately 20% higher than those of the rest of the country and province. In 2007 the total value of farm / smallholdings sales in the area represented approximately 29% of farms / smallholding sales in the province. This again showing that the intervention had a positive impact on the area.
- The number of private sector product offerings increased from about 30 in 2003 to 417 in 2008, not all of the new offerings are related to the palaeoanthropological sciences, but the increase in the number of offerings has had the desired effect in that there has been a boost to the economy of the area and also more people are coming to know about the universities important research activities being conducted in the area.
- In 2001, when the COHWHS was proposed, it was predicted that the Maropeng site would attract 68 000 visitors p.a. by 2007. The actual visitor number calculated for 2007 was 78 246. It was estimated that the number of visitors to the area in general would increase from 300 000 in 2001 to about 1 000 000 in 2007. It has been estimated that this target was also reached.
- The national government had made a commitment that all heads-of-states visiting the country, would be taken on a tour of the two attractions and that they would leave a cast of their footprints at the Maropeng Centre. This has resulted in international exposure for the WHS in countries around the globe without impacting on the marketing budget for the project.

Some of the benefits accrued to the university since this partnership was entered into:

- The commitment of the government to take all its international visitors on a tour of the two attractions has resulted in the university's work being publicised more widely and this has resulted in more favourable responses to donor funding requests to sustain the research being carried out.

- The closer working relationship between the university and the national government has resulted in palaeontological sciences being identified as one of the seven research areas that will receive priority from the National Research Fund.
- Funds from the Public Benefit Trust (BBT) has been used for research purposes.
- The university's other museum on campus (the Origin's Centre) has developed a close working relationship with the two in the area.
- When a new humanoid species was unveiled earlier this year, the event was joint event hosted by the university and government departments. Without government funding, the event could not have been as high profile as it turned out to be. The level of government assistance for this event would not have been provided without this partnership.

## Conclusion

The University of the Witwatersrand, the Gauteng Province, the Department of Science and Technology and a number of businesses came together in a partnership in which the university contributed its IP, the government departments contributes capital funds and the businesses contributes their business skills to benefit an economically depressed community through ecotourism. The partnership was not set up in the mould of a traditional triple helix relationship but when one looked deeper into the relationship, one sees all the characteristics of a triple helix relationship. There was clearly a blurring of the traditional roles in some areas and innovation was a key component of the relationship. What set this relationship apart was the fact that the beneficiaries were not only the partners in the formal arrangement, but there were spin-off benefits to others associated indirectly with the partnerships. This has been a successful partnership and the model is being used as a basis for a number of other partnerships in the country.

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