Environmental management with community involvement at tourist destinations

A systemic comparison between cases in China and Australia

A report to the

Academy of the Social Sciences in Australia

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1. Research background

Tourism development is of great importance not only to regional development and the national economy but to the welfare of the local community of tourist destinations [1]. Therefore the sustainability of tourism development has long been a major concern for government, policy makers, tourism operators, park managers and local communities. Environmental protection at tourist destinations is regarded as a major vehicle to facilitate sustainability, while the local community's involvement in the environmental management process is believed to be crucial during this process [2-4]. The effectiveness of environmental protection through the local community's active involvement varies due to the differences of natural, social, economic and cultural environments [5, 6]. Australia is regarded as an international leader in the area of environmental protection at tourist destinations, especially through the active involvement of local communities. During last three decades the tourism industry of China has achieved rapid developments but at the cost of pressures on the environment. Environmental problems at popular tourist destinations have been continuously reported.

2. Research objectives

The research target is to systemically analyse the environmental management system at two tourist destinations in which local communities are actively involved; one in Australia and one in China. The aim is to identify transferable environmental management practices that will benefit both countries. Two objectives have been determined to shape this research, as follows:

- To understand the systemic structure of community involvement in environmental management at tourist destinations.
- To identify barriers and drivers to management performance in order to identify transferable management practices under different economic, social and cultural conditions.

Jiuzhai Valley National Park in China and Kangaroo Island in South Australia are the two world class tourist destinations selected as cases to explore the research issue and to meet the research goals.

3. The research design

3.1 The systems thinking approach

Environmental management at tourist destinations is a complex problem which is embedded in a dynamic economic, social, natural and cultural environment, and in which many stakeholders are involved.

A systems thinking approach will be employed to address this complexity. The strength of the systems approach lies in its ability to intervene in real-world problem situations, as systems thinking equips researchers with appropriate knowledge and toolkits for understanding complex systems [7, 8]. In addressing complexity, systems thinking focuses on the root causes of problems through exploring the systemic structures, and mental models that underlie complex situations [9].

The *four levels of thinking* framework (Figure 1) is used in this research [10]. It serves as a guide for researchers to address complex issues right through the superficial level to the root level. *Four levels of thinking* shows the depth of thinking in a vertical way by focusing on thinking at events, patterns, systemic structures and mental model levels [9, 10]. The key tool used in this research is causal loop diagrams which enables complex systems to be described in terms of cause-and-effect relationships. Causal loop diagrams encourage the appreciation of a holistic view, both with regard to scope and time, avoids parochialism and short-termism. It also helps to uncover key stakeholders' mental models which in turn offer a powerful means of communication among stakeholders for better cooperation as well as identifying leverage points for sustainable interventions.

3.2 The research procedures

An adaptation of the procedure of systems analysis proposed by Maani and Cavana [10] has been used, which involves the following steps:

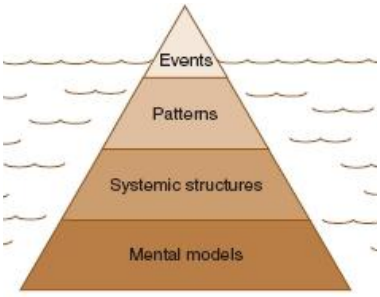

Figure 1 Research framework based on four levels of thinking

- Extensive literature review
- Fieldwork for data collection
- Systems modelling the researched issues with causal loop diagrams
- Making sense of the systems models
- Develop an understanding of the systemic structure through identifying barriers and drivers to success, feedback loops, balancing loops, and systems archetypes in the models.
- Identify leverage points and systemic interventions
- Comparing the two environmental management systems for transferable environmental management practices.

3.3 The two research sites

3.3.1 Kangaroo Island

Kangaroo Island is Australia's third-largest island. It is situated in the state of South Australia 112 km south-west of Adelaide at the entrance to Gulf St Vincent. Kangaroo Island is internationally renowned for its spectacular landscapes and amazing diversity of wildlife. In 2009, the island received one of Australia's top tourism accolades when it was declared part of Tourism Australia's National Landscapes program. Tourism is a key contributor to economic growth and development on Kangaroo Island, next to agriculture, with both boosting productivity on the island and providing a source of stable employment for residents [11].

Having separated from the mainland during the last Ice Age, Kangaroo Island has retained many plants and animals no longer found elsewhere. There are over 850 native plants registered on Kangaroo Island with more than 400 different species found within the Flinders Chase National Park. Free from mainland rabbits and foxes, the Island is a natural habitat for platypus, goanna, glossy black cockatoo, albatross, seals, penguins and the Island's own species of kangaroo. Its shores are also home to the elusive leafy-sea dragon [11].

Kangaroo Island has become a popular tourism destination with 21 national and conservation parks covering more than 30% of the Island and dramatic scenery ranging from the Little Sahara to huge sculptured granite boulders, which are truly 'Remarkable Rocks'. About 190,000 tourists visit Kangaroo Island each year. Kangaroo Island Council is the Local Government agency for beautiful and unique Kangaroo Island and 4,500 residents live on the island. The people of Kangaroo Island are proud of their unique history and the natural beauty of the Island [11].

3.3.2 Jiuzhai Valley National Park

Jiuzhai Valley National Park is located in Aba Tibetan and Qiang Autonomous Prefecture, northwest Sichuan Province, in South Western China. Jiuzhai Valley National Park is best known for its spectacular scenery which is situated at an elevation ranging between 1,990m to 4,764m above sea level, includes fabled blue and green lakes, waterfalls, narrow iconic Karst landscape and unique wildlife. “Jiuzhai” means nine villages in Chinese (Mandarin). The park was named after nine old Tibetan villages in this area. It was declared a UNESCO World Heritage Site in 1992; the park also joined the Man and Biosphere Conservation Network in 1997. The recent statistics shows that tourist numbers have reached a total of 3.6 million during the year of 2012. The number of foreigner tourists visiting Jiuzhai Valley National Park has been fluctuated around 100,000 annually, while the year 2007 saw the number of foreigner tourists escalate to a record of 240,000 [12].

The park covers over 720 km^2 area, on top of that is another 600 km^2 buffer zone, which extends from East Longitude 103°46′-104°4′ and North Latitude 32°51′-33°19′. Tourism activities are mainly planned in an area of 77 km^2, which is part of the *Experimental Zone* of the Natural Reserve. Jiuzhai Valley has a temperate climate characterized with warm wet summer and cold dry winter with an average annual temperature of 7.3°C, average humidity in 60 and a total rainfall of 761mm annually [12].

Jiuzhai Valley National Park is governed by Jiuzhai Valley Administration Bureau which is directly under the government of Aba Tibetan and Qiang Autonomous Prefecture. There are approximately 1,000 permanent Tibetan people constituting about 110 families in all nine villages [12].

3.3.3 Field trips for data collection

Two field trips were conducted by two chief investigators. During September 2013 the two chief investigators conducted a 5-day field trip in Jiuzhai Valley National Park, accompanied by a Tibetan guide who had grown up in the local community and now is working for Jiuzhai Valley Administration Bureau. Having a local guide enabled us to interview the head of one village, some local households, business managers, and some tourists. We also had the chance to merge ourselves into different groups of tourists to experience the tourism environment in the most popular scenic spots. Most of the interviews were conducted informally because we found it was hard to build rapport when formal interviews were conducted. The following are some photos taken during the field trip in Jiuzhai Valley National Park.

Some photos taken at Jiuzhai Valley National Park with informants

In November 2013, the two chief investigators conducted a 3-day field trip to Kangaroo Island. During the field trip we interviewed two managers from Kangaroo Island Council, one manager from Kangaroo Island Tourism, and one manager from Natural Resources Kangaroo Island. The following photos were taken during the Kangaroo Island field trip.

Some photos taken at Kangaroo Island with informants

Data collected from the field trips in the Jiuzhai Valley National Park and Kangaroo Island, along with data drawn from the literature, underlie the systems analysis of the researched issues[13, 14].

4. Systems analysis and key findings

4.1 Description of the environment of two researched sites

Based on the interviews conducted and the field investigations in Jiuzhai Valley National Park and Kangaroo Island, the following characteristics emerged.

4.1.1 Jiuzhai Valley National Park

Positive aspects

- Achieved high level economic development within the park and regions around the park
- Jiuzhai Valley Administration Bureau have made significant efforts to protect the natural environmental within the park
- Set up channels to financially benefit the local community within the park (34,470 CNY /Person*Year in total in 2012)
- Established a Foundation for local communities inside the park for their further development
- Employing people from the local community to work as cleaners in the park, and for locals who have a University degree or diploma, management positions are offered within Jiuzhai Valley Administration Bureau.
- Equally offers to all the local residents of counters in a souvenir market which locates in the park

Environmental issues

- Lack of a mechanism for effective communities' involvement for decision making in tourism, resource development, and environmental protection
- Unbalanced development of communities between those inside and outside the park
- Maximum tourist carrying capacity is being challenged
- Tourism impacts on local culture
- Environmental management practices currently clean up after tourists, rather than focus on educating the tourists appropriately

4.1.2 Kangaroo Island

Positive aspects

- Pristine environment and diverse naturally-based tourism activities
- Well-built multiple channels for local communities to be involved in environmental management
- Tourism Optimization Management Model (TOMM) is in place for monitoring the satisfaction level of both tourists and local residents
- There is tremendous potential for tourism development in terms of the tourism carrying capacity of the Island

Environmental issues

- Conflicts between the protection of an endangered species and the road safety management
- Pressures on infrastructures due to the increasing tourist number
- Natural fluctuation of wild animal numbers affect tourism attractions

4.2 The identified variables for causal loop modelling

- Tourism companies
- The quality of tourism resources
- The scale of tourism (resources) development
- Infrastructure for tourism development

- The number of tourists
- The tourism income
- Social environment
- The satisfaction level of tourists
- The satisfaction level of local residents
- Infrastructure of local city/township
- Natural environment
- Environmental management systems
- Environmental management decisions/measures
- Resident satisfaction survey
- Tourist satisfaction survey
- Local council revenue from tourism
- Investment on infrastructure

4.3 Causal loop modelling- understanding the common systemic structures of two researched sites

The systems analysis started from modelling concerned issues of both researched sites by showing their common systemic structures. Figure 2 shows a loop of tourism development which forms a reinforcing process, of which the scale of tourism development depends on the quality of the tourism resources and tourism development drives the construction of infrastructure. Improved infrastructure attracts and accommodates more tourists which then further drive the tourism development.

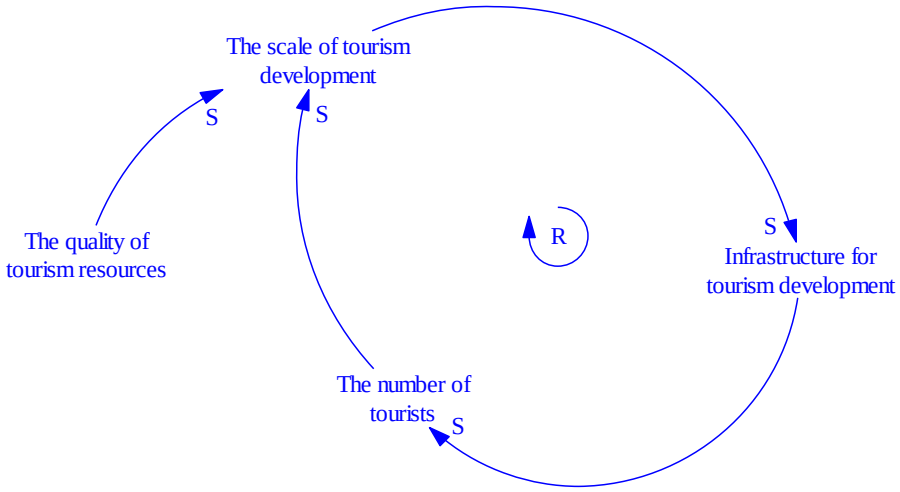

Figure 2 The tourism development loop

Legend: S (same direction), Arrows: (cause or affect relationship), R (Reinforcing)

Figure 3 below shows tourism development with the primary target of achieving economic development through earning tourism income. The model shows tourism income as a variable embedded in a reinforcing loop which indicates the increasing number of tourists will bring better tourism income. Yet, up to now this model hasn't taken into consideration many other factors which are part of the tourism development system.

The model in Figure 4 shows tourism development model with the satisfaction level of tourists is taken into consideration. At this stage the satisfaction level of tourists is also embedded in a reinforcing loop; however the satisfaction levels of tourists are also closely affected by whether or not the tourist destination can provide sound natural and social environments, and whether the infrastructure can meet their needs. The significant value of this model is that it links tourism development and environment in the tourism development system.

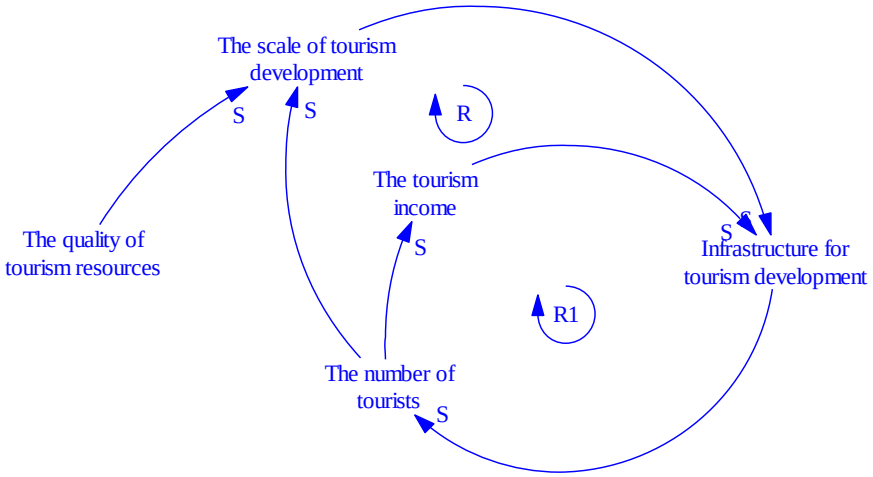

Figure 3. Tourism income the core of tourism development

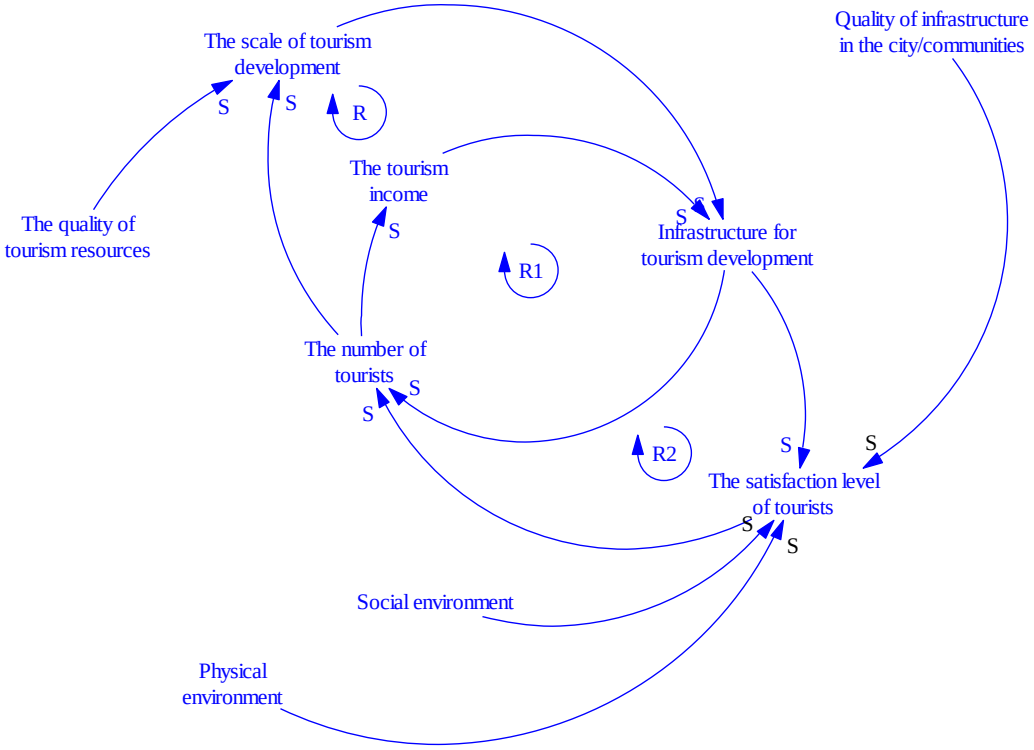

Figure 4 Tourism development, taking the satisfaction level of tourists into consideration

The model in Figure 5 further considered how tourism development will affect environment. Generally tourism development imposes negative impacts on environment. Linking tourism development and environmental impacts formed two balancing loops; which indicates that tourism development is restrained by the quality of environment. This is the fundamental reason that the development of tourism should minimise its environmental impacts in order to achieve a sustainable tourism.

As shown in Figure 6, the satisfaction level of local residents is affected by many factors including quality of environment, tourism income that can benefit them, how tourism development affects their use of infrastructure, etc. Overall the satisfaction level of local residents will eventually affect their opinions and actions whether they will support or oppose tourism development.

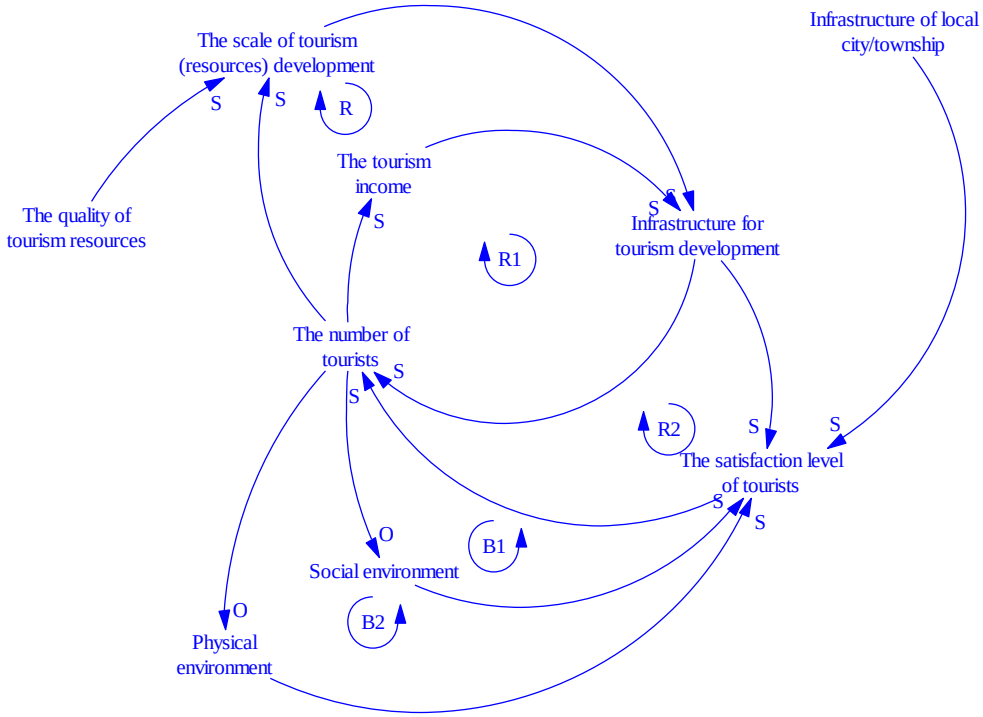

Figure 5. Environmental impacts of tourism are further considered

Legend: O (opposite direction), B (balancing feedback loop)

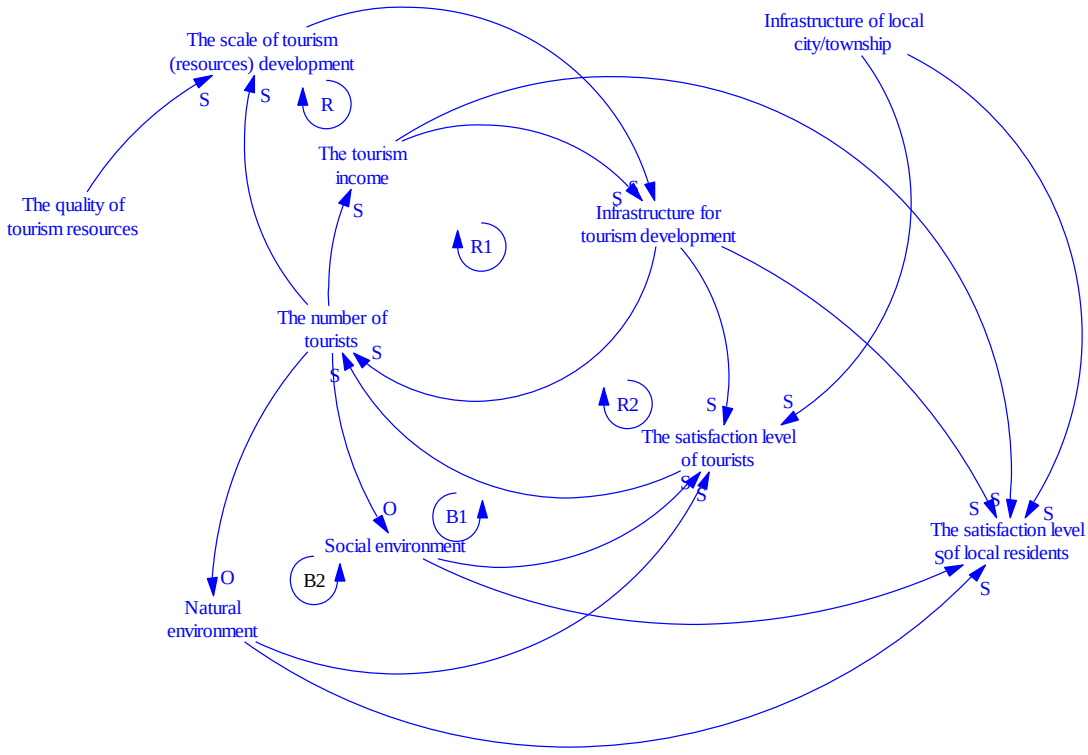

Figure 6. The satisfaction level of local residents is further considered

In order to minimize tourism impacts on environment, different environmental management systems are generally put into places. The model in Figure 7 has taken the environmental management systems into consideration. Up to this point, the model shows the basic systemic structures of tourism development, environmental management, how tourism development affects satisfaction of both tourists and local residents, and interactions between these

issues. This model also provides a platform for the researchers to explore the research issues to address the two proposed research objectives.

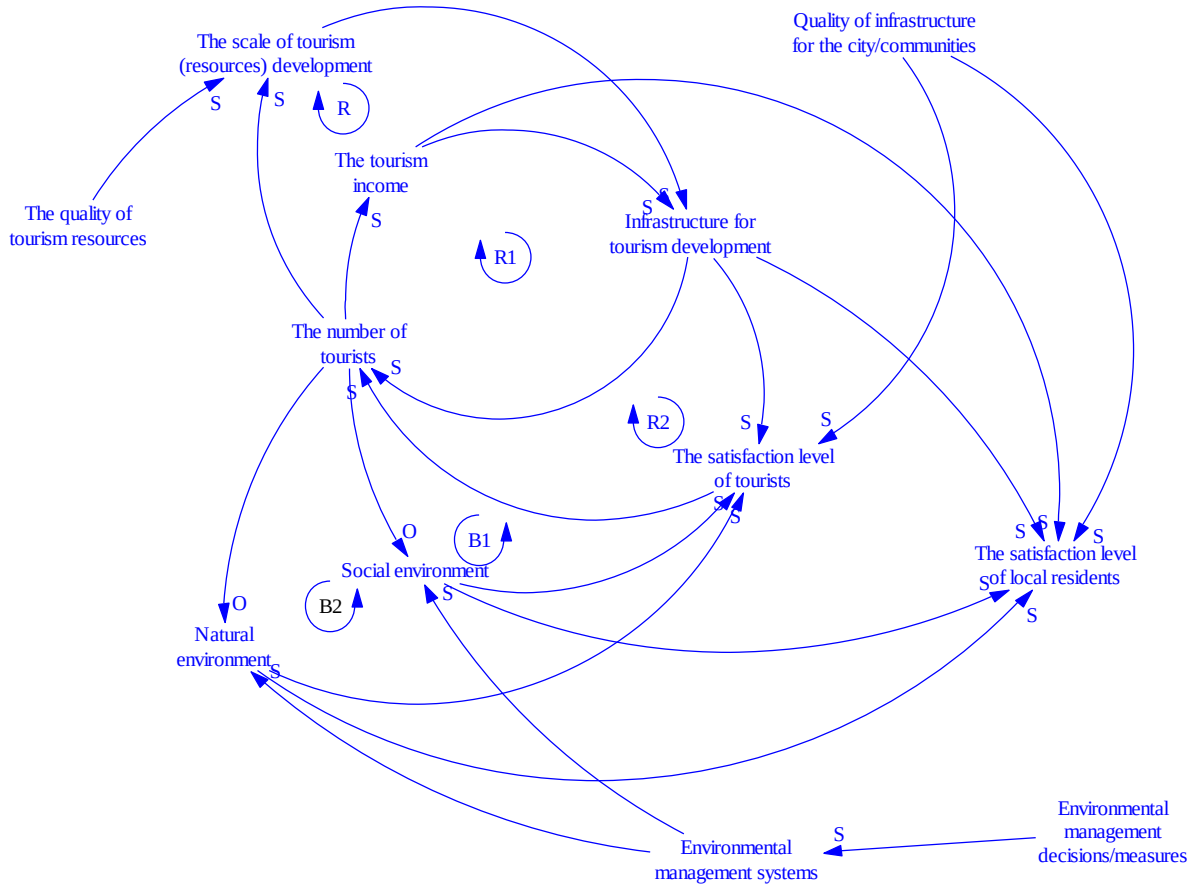

Figure 7 Environmental management systems are further considered

4.4 The systems analysis

The fundamental systemic structure which is embedded in the model of Figure 7 formed a “limits to the growth” archetype (see Figure 8). This archetype emphasizes that tourism development is limited by the quality of the tourism environment. Failure to manage the environment properly means that a sustainable tourism can’t be achieved.

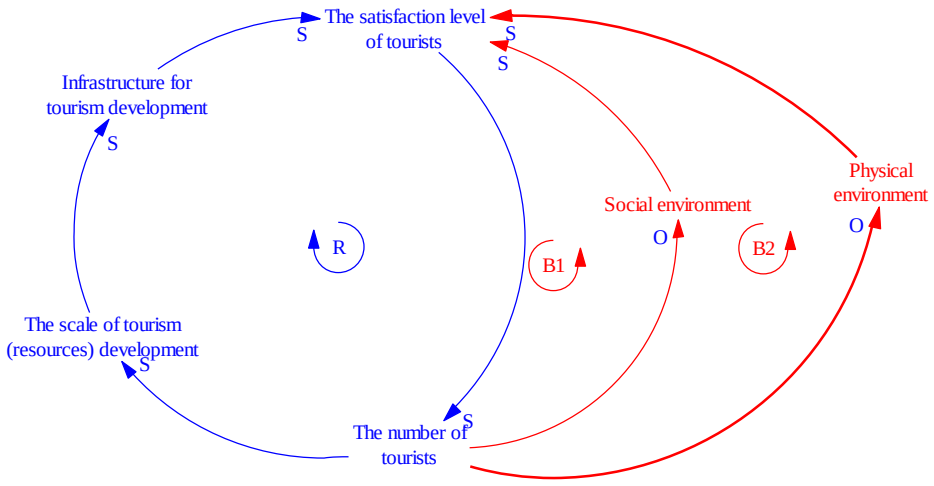

Figure 8 The quality of environment limits the growth of tourism

4.4.1 Kangaroo Island - environmental management with community involvement

Overall, Kangaroo Island has very few environmental issues caused by tourism development. Multiple channels are established for the local community to be involved in environmental management. In particular, the Kangaroo Island Council implemented the Tourism Optimisation Management Model (TOMM), which provides an efficient mechanism for local government to understand how tourism affects both tourists and local residents. In terms of local communities' participation in environmental management, the TOMM system also lays solid foundation for local Government to understand what key issues concern local residents', so environmental management decisions can be made by fully considering the needs of local residents. Other channels for local residents to participate in environmental management including having members from local communities on the board; and involving them in various community activities organized by Natural Resources Kangaroo Island for environmental protection on the island. As the current number of tourists visiting Kangaroo Island is far below the tourism carrying capacity, there is no evidence that tourism causing natural environment problems.

Our field investigation at Kangaroo Island suggested that large tourist number is imposing high pressure on local infrastructure, yet this was debatable, and not necessarily a serious concern. The number of local residents on Kangaroo Island is only about 4200; in contrast the number of tourists has reached over 200,000 annually. The contention lies in the fact that funding for maintaining local infrastructure mainly depends on council rates from local residents, but the infrastructure is being utilized by all the tourists as well, without the tourists contributing to the costs. This is due to tourism on Kangaroo Island being mainly run by the company SeaLink, which means the majority of tourism income will go to the SeaLink Company rather than to local Council, so local Council and residents bear the cost while SeaLink takes the profits. Local government officers claim that so far there are no efficient channels in place for local Council to recover the cost of maintaining infrastructure from tourism. This situation is modelled in the Figure 9, where the red broken line from "The tourism income" to "Local government revenue from tourism" shows in the dysfunction section of the system which needs to be addressed. SeaLink Company does provide a certain number of free ferry tickets for local residents to travel between the island and the mainland, as is shown in the model of Figure 9.

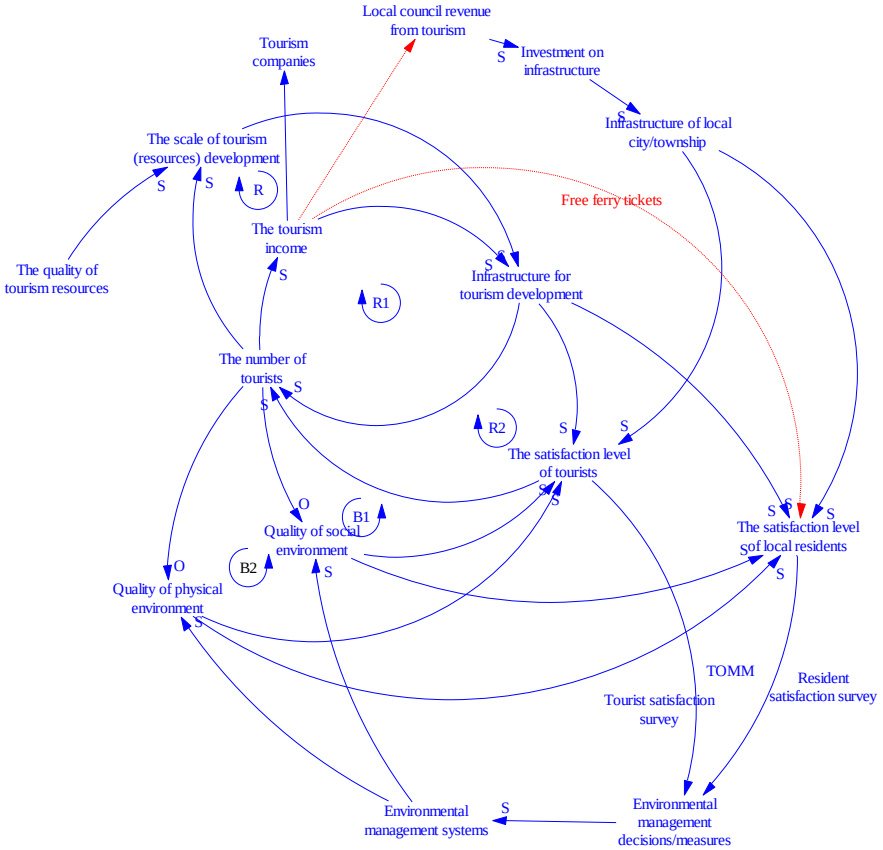

Figure 9 The status of tourism development on Kangaroo Island

Local government has once proposed to increase levies on the SeaLink company to fund maintenance of infrastructure on Kangaroo Island. However, SeaLink increased the price for their services so that the increase of levies charge to SeaLink can be recovered from tourists. There is no doubt that the increased charge to tourists negatively affects the number of tourists who will visit Kangaroo Island as a result. This is not the intention of local council because it is clear that a healthy tourism industry on the island is needed for regional prosperity. This shifting cost from SeaLink company to tourists can be modelled as seen in Figure 10 in which a system archetype named ”Shifting the burden” is formed.

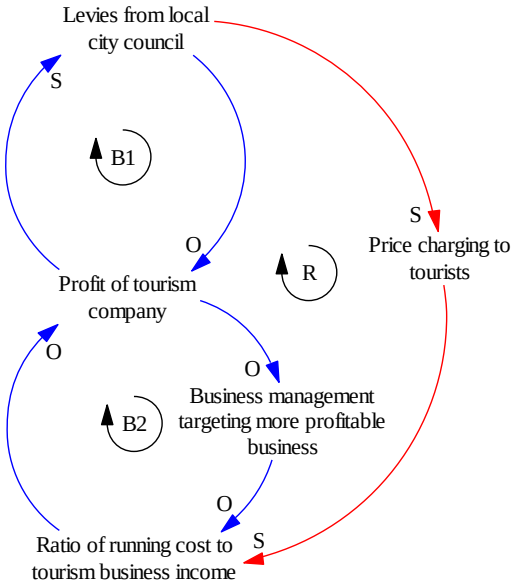

Figure 10 Tourism company shifting the cost to tourists- “Shifting the burden”

Two environmental issues that popped up are the decreased number of penguins, and the dilemma regarding clearing vegetation for road safety. Penguins on Kangaroo Island are a major tourist attraction. Due to the increased number of seals, the number of penguins is decreasing and the related sightseeing programme has to be suspended due to the lack of penguins to be seen. Government officer also mentioned their dilemma in clearing the roadside vegetation for road safety purpose; as an endangered species named “Narrow-leaf Mallee” is scattered along the roadside. These two issues are not directly caused by tourism, but they are tourism related, and will also need to be addressed in the long run.

4.4.2 Jiuzhai Valley National Park- the environmental management under communities’ involvement

Jiuzhai Valley National Park is regarded as one of the leaders in managing tourism development and tourism impacts on the environment across China. Our investigation confirmed that Jiuzhai Valley Administration Bureau which is a County level Government does put in tremendous efforts to manage the environment in the park, and the residents from local communities also significantly benefit from tourism development. However, in our opinion the local residents’ involvement in environmental management is dissatisfactory. Key findings from the field investigation are shown in the systems model of Figure 11.

Tourism development has brought about benefits in many aspects to local communities. As was summarized in section 4.1, tourism development has increased income, provided various job opportunities, and established a Foundation for local communities’ further development. All these achievements can be attributed to established channels for tourism income to benefits the local residents, which shows in the solid red line in Figure 11. Those established channels including direct compensation, subsidy for the Grain for Green Project, bonus from incorporated restaurant within the park and other similar projects. Jiuzhai Valley National Park is directly managed by local government that facilitates the diverting of tourism income to local communities.

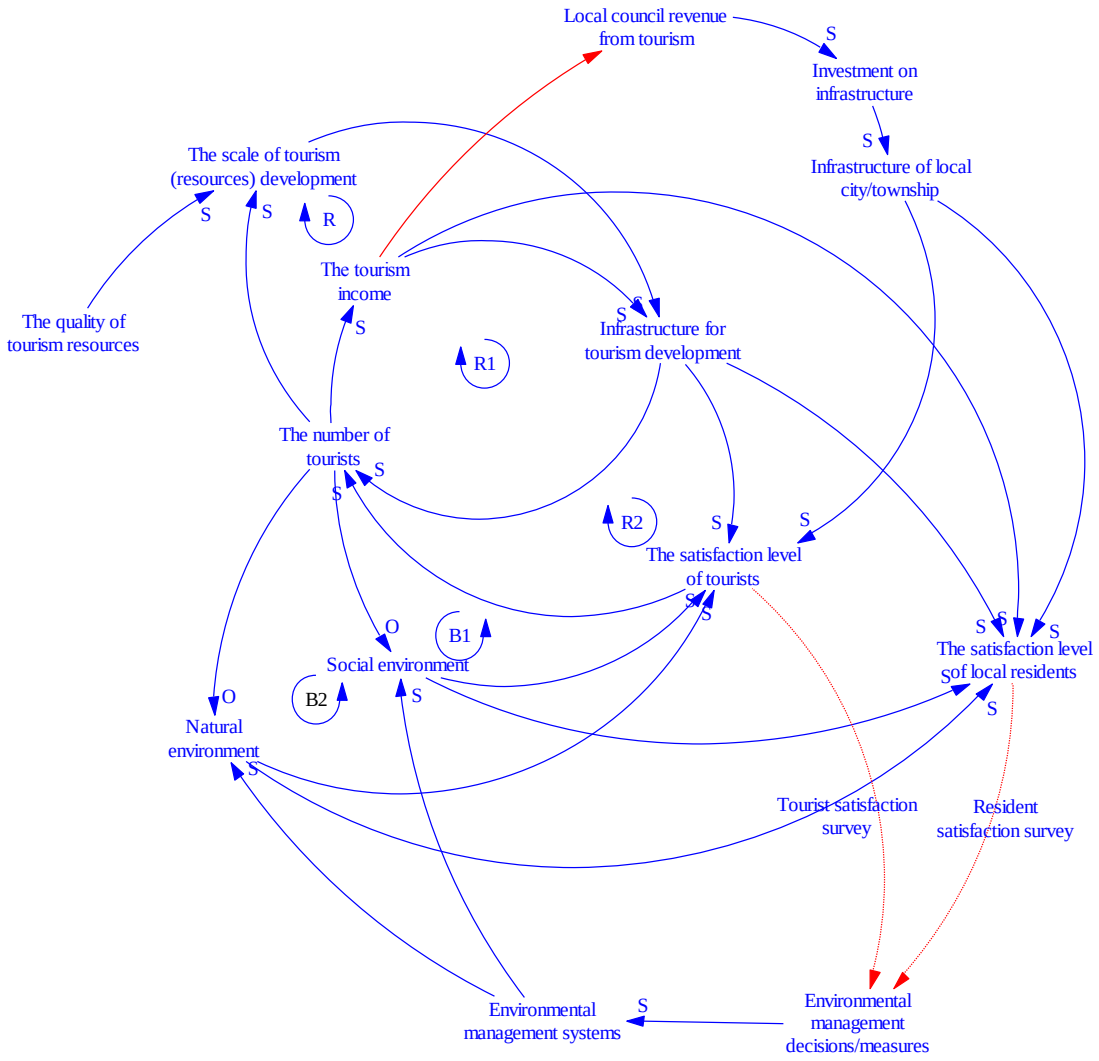

Figure 11 The status of tourism development at Jiuzhai Valley national park

Further investigation also revealed that all the environmental management decisions were made almost exclusively by local government, with very limited involvement from local communities. There is only a very weak voice, if any, for local residents to be able to express their opinions on either tourism development or environmental management. As a matter of fact, local residents were unwilling to express their opinions openly, as we experienced during our interviews with them. The dual lack of both mechanism and supportive social cultural environment for local residents to provide their feedback on environmental management issues inhibits their involvement in environmental management (red broken line in Figure 11). In the meantime, our interviews with local residents found that they do have abundant knowledge on environmental protection, which originates from their experience and their religious beliefs.

Another identified environmental issue is the unbalanced development between communities inside and outside the park. Communities inside the park can only engage in limited commercial activities that are allowed by local government, but communities outside the park don't have any imposed limitation on commercial activities. This has led to the average income of residents within the park being less than half of those who live outside the park. The dissatisfaction of local residents inside the park is quite strong. They believe that they don't have equal opportunities to compete with those residents who live outside the park, due to imposed government regulations. There is a great danger that local residents inside the park will use natural resources in inappropriate ways. The scenario is modelled in Figure 12 which shows a "Fixes that fail" archetype. The model indicates that the lack of holistic views on policy

may lead to unintended consequences; while local communities' involvement in policy making would potentially be able to minimize the unintended consequence.

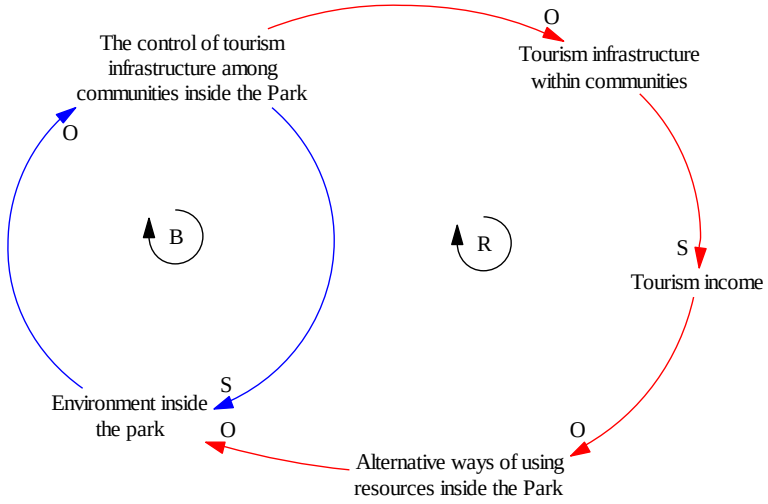

Figure 12 The potential of unintended consequence of environmental management policy

The researchers were impressed by the cleanness and tidiness of the environment in Jiuzhai Valley National Park. However, this was achieved by the hard work of hundreds of cleaners, some of them from local communities, to clean up the rubbish after the tourists. Better environmental management would focus on educating the tourists to pay attention to their improper behaviour in due ways rather than cleaning up the mess after them. It is believed that empowering local communities' involvement in designing and conducting a series of campaigns targeting environmental education to both local communities and tourists would definitely make a great difference.

The optimal tourism carrying capacity in Jiuzhai Valley National Park was calculated as 23,000 people per day; however peak visitation per day reached 41,800 people on 2nd of October 2013, which led to more than 4000 people being unable to get out of the park on time. How to manage the peak visitation efficiently is still a challenge to the park managers, and the overload of tourists itself creates high pressure on the environment in the park.

The region of Jiuzhai Valley National Park is characterized with Tibetan culture, which is also commercialized by some tourism companies through presenting various shows on stage. Problems are caused by profit-oriented shows that distort the authentic culture, and disorderly competition among the companies is not uncommon. A different voice on this issue was the potential for culture shows to revitalize culture rather than pose negative impacts on it.

4.5 Thoughts on barriers and interventions

The process of comparative systems analysis on both researched sites actually revealed the systemic structures of the tourism-environment system. The identified archetypes in the tourism-environment system imply leverage points for interventions. For example, the "limits to the growth" archetype (Figure 8) reconfirms that environmental management has to keep up with the tourism development. Only by addressing environmental management in a systemic way, can tourism sustainability be secured.

In the case of Kangaroo Island, the revealed key environmental problem was the lack of appropriate channels to divert (enough) tourism income to local council and local residents. Simply imposing more tax on tourism businesses only leads to shifting the costs to tourists. Possible interventions to "Shifting the burden" systemic structure lie in the necessity for communications between local council and tourism companies on how to share the burden through improving management efficiency for sustainable tourism on the Island, rather than simply shifting the burden to others.

The key environmental issue in Jiuzhai Valley National Park is a lack of real mechanism which enables local communities to participate in environmental management decisions. Current regulations impose limitations on local residents inside the park for tourism related commercial activities compared to those who live outside the park. A systemic structure of "fixes that fail" underlies this scenario, with risk that over time, dissatisfied residents inside the park may start to utilize the resources in unsustainable ways - which is completely opposite to the intention of the Jiuzhai Valley Administration Bureau. Effective interventions require the adjustment of the regulations to benefit residents both inside and outside the park equally.

It can also be concluded that in planning and policy making there is a lack of systems tools and methods that can embrace a holistic views. This lack is a common problem when dealing with issues that are multi-dimensional and multi-stakeholder related. The systems approach used in this research clearly reveals that active communication among key stakeholders, to form shared mental models on common care issues, is the most needed root intervention, and the modelling process shown in this research provides a platform for stakeholders to use, to engage in communication using a common graphic "language".

5. Conclusions

Key conclusions drawn from this research are:

(1) The environmental management systems in both researched sites were developed independently in their own ways, and are both highly efficient. The Kangaroo Island National Park has established different channels for local communities' involvement in environmental management. It is fair to say even the identified tourism income allocation issue was not particularly serious. The Jiuzhai Valley National Park hasn't established efficient channels for local communities' involvement in environmental management; but local government has been taking great efforts to protect the environment within the park. Different channels to allocate tourism income to local communities and residents have also been established, for instance, through direct compensation, subsidy for the Grain for Green Project, bonus from incorporated restaurant within in the park etc.

(2) The effectiveness of environment practices is economic, social and culture related. This research revealed that to identify transferable environmental management practices requires significant caution, especially for those successful environmental management practices which are from completely different economic, social and cultural environments.

(3) The research process itself also demonstrates that the use of causal loop diagrams to describe the complexity of real systems highlights the connectedness of the component parts, which also provides a platform for discussion, communication, and policy formulation. Causal loop diagrams can also help people identify the most appropriate way of influencing the system of interest by using systems archetypes and their associated mental models for leverage points. As a result, poor decisions like quick fixes can be avoided.

(4) Joint research funding effectively bridged researchers between Australia and China. This not only promotes collaboration, but also facilitates knowledge sharing. Based on this research a project proposal has been submitted and journal papers are under preparation in both English and Chinese.

(5) There are some limitations to this research in that causal loop modelling is static and cannot be used to describe how the properties of a system evolve over time. The strengths of causal loop modelling as presented in this paper are excellent for quickly capturing stakeholders' hypotheses about the causes of dynamics; eliciting and capturing the mental models of individuals or teams; and communicating the important feedback regarding what people believe is responsible for a problem. For the purpose of understanding quantitative change or the magnitude of dynamic change, the models presented in this report can be further developed into quantitative models for scenario analysis and associate decision making.

Acknowledgement

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References

1. Richards, G. and D. Hall, *The community: A sustainable concept in tourism development.* Tourism and sustainable community development, 2000. **7**: p. 1-13.
2. Swarbrooke, J., *Sustainable tourism management*. 1999, New York: Cabi.
3. Tosun, C., *Limits to community participation in the tourism development process in developing countries.* Tourism management, 2000. **21**(6): p. 613-633.
4. Warburton, D., *Community and sustainable development: participation in the future*. 2013: Routledge.
5. Harper, P. and M. Stabler, *The importance of community involvement in sustainable tourism development.* Tourism and sustainability: principles to practice., 1997: p. 143-149.
6. Jamal, T.B. and D. Getz, *Collaboration theory and community tourism planning.* Annals of tourism research, 1995. **22**(1): p. 186-204.
7. Bosch, O.J.H., et al., *Getting the big picture in natural resource management - Systems thinking as 'method' for scientists, policy makers and other stakeholders.* Systems Research and Behavioral Science, 2007. **24**(2): p. 217-232.
8. Jackson, M.C., *Systems approaches to management*. 2000, New York: Kluwer Academic Publishers.
9. Senge, P.M., *The fifth discipline: the art and practice of the learning organization* 2nd ed. 2006, New York, USA: Currency Doubleday.
10. Maani, K.E. and R.Y. Cavana, *Systems thinking, system dynamics: managing change and complexity*. 2nd ed. 2007, Auckland, N.Z. : Prentice Hall.
11. The South Australian Tourism Commission. *Kangaroo Island*. 2014 22 May 2014]; Available from: http://www.southaustralia.com/regions/kangaroo-island.aspx.
12. Jiuzhai Valley Administration Bureau. *Park Information*. 2014 22 May 2014]; Available from: http://www.jiuzhai.com/language/english/information.html.
13. TOMM Committee Kangaroo Island, *Visitor exit survey 2012/2013*. 2013, TOMM Committee Kangaroo Island.
14. TOMM Committee Kangaroo Island, *Resident survey 2012/2013*. 2012, TOMM Committee Kangaroo Island.