

Sustainable Collaborative Management for Conserving River Water Quality in Japan and Australia

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Abstract

This paper considers how the collaboration between diverse forms of local traditional knowledge and modern scientific knowledge can be achieved in Australia and Japan. It also examines methods to implement the co-operative management of the source of river with collaborative knowledge, which consists of local traditional knowledge and modern scientific knowledge through the recent pilot program I am conducting in Japan.

Introduction

Indigenous knowledge has various knowledge that relates with Identity, source management in the different indigenous communities. It also has different verification systems that allow for the renewal of knowledge, specific to the changing conditions of its enactment and practice. Indigenous Knowledge is therefore different things in different places to different people (Nakata 2007).

Firstly, I overview the concept of Indigenous Knowledge in the Anthropological context. Secondly, I show what indigenous knowledge in the South East Australia. My consideration goes out into the practical case on the land and river management taken by indigenous and local people in Australia and Japan. Finally, I propose what research is effective into two ways or multiple ways management on the land and river.

In the next chapter I would like to express the role of Indigenous Knowledge in the ethnographic context considering relationship between nature and culture.

1. Role of Ethnography in Considering Relationship between Culture and Nature

It concerns the relationship between ontology and epistemology on the modern scientific knowledge and the indigenous traditional knowledge in the anthropological context.

In the 17th century, the Enlightenment characterized the relation between nature and culture as the mind-body dualism which regards mind as culture in terms of epistemology and body as nature in terms of ontology. One world ontology was the thought dealing with nature as static entity, on the other, occidental dominant perception only regarded nature with one form of epistemology.

Since 1940s new idealistic theories from Anthropologists like F. Boas, J. Steward and

Claude Lévi-Strauss attacked this mind-body dualism. For instance, Cultural relativism premised one world ontology but criticized one form of epistemology. However, perspectivism like Viveiros de Castro overturning the relativist perception regarding one world ontology with multi forms of epistemology, has suggested a new perspective, that is, multinaturalism, which refers multiple worlds ontology with one form of epistemology. Although this perspective theory criticized “ontology turn”, it is question that how we can achieve the transformation of multinaturalism (natures) in multiple forms of epistemology (cultures).

In these disputes, Ethnographic research could play some significant parts in creating a new dialogic space for the dispute on relation between nature and culture. For instance, sustainable collaborative management for conserving river and forest is one of the significant parts in which anthropologists can play. It shows how the ethnographic research can contribute to the environmental issues focusing on two case studies of river and forest managements by two ways or multiple ways ecological approaches between the indigenous or local traditional knowledge, and the modern scientific knowledge in Australia and Japan.

Next, this paper will show how to incorporate Indigenous Traditional Knowledge into Modern Scientific Knowledge in Australia.

2. Indigenous Estate - Aboriginal lands, Native Title determinations, declared Aboriginal protected area and others

Indigenous Knowledge plays a role in guiding decision making, it underlies cultural and spiritual ceremonies and practices and acts as a bond securing community cohesion. For indigenous peoples the notion of traditional knowledge incorporates both the intangible aspects of knowledge and the tangible manifestations of its application including local seed varieties, traditional medicinal products and farming practices. It is an extensive body of informal science in areas such as agriculture, fisheries, ecosystem management and is now recognized as having an important role to play in mitigation of climate change. Therefore, an important aspect of Indigenous Knowledge is that Indigenous peoples hold collective rights and interests in their knowledge (Nakata 2007).

In 2008, a practical project on two-way ecological managements, that is “people on country”, had been carried out by four main actors that consisted of indigenous rangers and organizations, academics from Australian National University, and sponsored companies and state until 2012. The main target of this program focused on the remote Australian Aboriginal land returned by Aboriginal land rights act and native title act. Exceptionally some parts of Aboriginal protected areas in NSW are also the target of this program. The total size of these Aboriginal protected areas is more than 23% of whole of Australia. The summary of this project by J. Altman and others with their theoretical framework as “hybrid economy”, that consists of three aspects; customary activities interact with state and market regimes, reported the positive

or negative results. While two-way ecological managements had been success in some aboriginal communities at NT, aboriginal communities in NSW had got a few positive results (Altman and Kerins 2012).

This paper would show a positive achievement on two-way ecological managements in settled Australia through the recent Yorta Yorta peoples ecological management on wet land.

2.1 Aboriginal Protection Reserves, Stations and Missions in Settled/ White Australia

The Yorta Yorta is an eminent Aboriginal group among over 40 Victorian Aboriginal groups at south east Australia. They have strongly continued to fight for their civil, political, and social rights in the wider society since 1860s. Their home mainly locates in Barmah, Moira and Millawa forests on the border between New South Wales and Victoria. Recently, most of them live in the cities and towns such Barmah, Echuka, Moama, Shepparton and Mooloopuna along Murry and Golbern rivers. CD Rowley called these areas as settled or white Australia where dominant white populations live with some Aboriginal people (Rowley 1971).

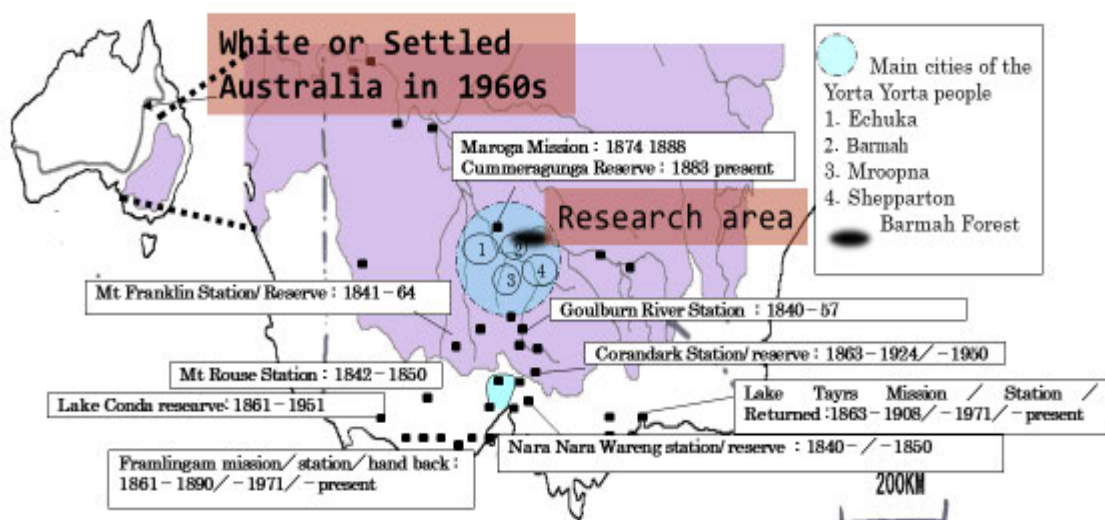


Figure 1. Aboriginal Protection Reserves, Stations and Missions in Settled/ White Australia

2.2 Indigenous Traditional Knowledge in South East Australia

Heather Goodall suggested that the recent dispute on Indigenous Traditional Knowledge at settled Australia is the controversy of the feature of the knowledge as stable or process. In her argument, there are three elements against the myth of untouched and stable knowledge. First is conventional way to make archives and databases such mapping visualization through painting. Second is life history and spiritual entity. Last is memory on colonization (Goodall 2008).

This paper takes consideration of Goodall's three elements for Indigenous Traditional knowledge in the settled Australia as an entity with changeable and process features. As for life

history and spiritual entity, the legend of Baiame is the story of creation for aboriginal people at south east Australia and Yorta Yorta shier this legend with other annex Indigenous groups. Colin Walker, who is an important elder of the Yorta Yorta Aboriginal group, told the meaning of the Marry river and Barmah forest.

“Our lakes, we got Barmah lake and Moira lake. When you look at the map, it looks like the living things because lakes look like kidneys and river running down through the lakes in the middle were the spine. If you look at properly you will see it looks like human body...”

These examples show how the Yorta Yorta understand environment and world with their traditional knowledge.

In considering memory on colonization over the Yorta Yorta Traditional area, the lumber industry supplied trees for rail way in 1860s. In 1870s, Victoria colonial government enforced the Drought Proof Policy, which controls flood in Murray-Goulburn Broken Catchment. Thus, many regulators and water ways were constructed for irrigation and agricultural and farm industry. However excessive cropping by irrigation led to the exhaustion of the soil. After enforcing the water policy for irrigation rights among three states; New South Wales, Victoria and South Australia, more facilities such weirs and dams for water allocation have been constructed but these facilities caused to drought and saltation for agriculture since 1930s. Three state governments did not cope with these issues until 1980s. In 1983 the Victoria government published the report on the environmental condition in Barmha forest and referred to indigenous people in only 2 pages out of 51 pages. Consequently, state park and forest were designated and the Darniya center for the Yorta Yorta people was established in the Barmah forest.

The Barmah forest has more than 380 species of indigenous flora and 220 species of indigenous fauna and is listed as a wetland of international significance under the Ramsar Convention. The forest contains more than 440 sites of cultural significance to the Aboriginal people. Nowadays, 17 fauna and 57 flora are protected by the federal and state governments. In 2008, river red gum trees occupied 80% of the forest and 75% faces with vulnerable condition.

2.3 Fire management monitoring

Although the Yorta Yorta lost their Native Title Claim in 2002, they got some achievements to improve their recent conditions of land and daily lives. Among them, the Co-operative Management Agreement with the Victoria State government was reached in 2004. Fire management monitoring is one of the programs in the co-operative management Agreement. They have also been seeking how to pass knowledge through making the “Land Use and

Occupancy Map” since 2006. These two practical managements come under the Goodall’s conceptional thought of Indigenous Traditional knowledge on life history and spiritual entity.

Two indigenous rangers have played crucial role in promoting fire management. They worked with green coops established by the federal government to train the Yorta Yorta youths who are from 17 years old to 20 years old in 2007. After finishing this half year program, students can get parks ranger certification.

The fire management monitoring is not traditional way but two way approaches between the indigenous traditional knowledge and the modern technologies like GPS system, Fire starter and fire engine. However, the Indigenous coordinator of the Green Coops criticized that the fire management was often controlled by non-Indigenous decision makers. The management masked the privileging of non-Indigenous methods with tokenistic Indigenous involvement or labour. Accordingly, the fire management monitoring stopped in 2010.

2.4 Land Use and Occupancy Map

“Land Use and Occupancy Map” has collected the Yorta Yorta traditional knowledge since 2006. The aims of this map let Australian society acknowledge the Yorta Yorta as Traditional Owners on the river and forest. The Yorta Yorta collected around 6600 sites as their cultural and spiritual significance from 66 respondents and they trained 6 coordinators for cultural map who have responsibility to record their traditional and living knowledge of forest and river into the map and take the living knowledge over the next generations.

2.5 Outcome of the Yorta Yorta Movement for designating Barmah national park.

The movement by The Yorta Yorta with other indigenous and non-indigenous people and two-way environmental management approaches led the state and the federal governments consider environmental management by indigenous initiative through the investigation to River Red Gum Forests by The Victorian Environment Assessment Council in 2006, 2007, and 2008.

River Red Gum Forest Investigation Report 2006 focused on the geological, historical, economic, political and environment conditions within the study area around 122 hectares. The report takes 16 pages out of 426 pages for Indigenous people. *River Red Gum Forest Investigation Proposal 2007* sets the explicit proposal and recommendations for the land and water management and takes 28 pages out of 148 pages for co-operative management with Aboriginal Traditional Owners. VEAC submitted the final report to the Minister for Environment and Climate Change in July 2008, which takes 46 pages out of 208 pages for Indigenous people.

Three reports dealt the Yorta Yorta as one of the very significant actors in conserving environment with joint or co-operative management. This VEAC final recommendations were passed in the Victoria State Parliament in 2009 and this decision led to the creation of the new Barmah National Park. In the following year, cooperative and joint management of Barmah

National Park, which acknowledged the Yorta Yorta as the Traditional Land Owner, was reached.

3. Two-Way Environmental Management Approaches

“Land and Occupancy Map” has achieved a growing presence since 2012 when Partnership between YYNAC and Monash university, Brown University in USA with 2 found research institutes was made to examine how Indigenous knowledge can contribute to improve climate change adaptation for the First Nations of Australia, and the Australian community in general. This program is the two-way environmental management approaches. The maps data is updated not only through the interview but also through the audio-visual data in the GIS framework. Thus, collected data such indigenous significant site recording video from elders and important persons is integrated into the GIS framework for passing the next generations as transgenerational knowledge. This is good practice to incorporate the indigenous traditional knowledge into the modern scientific knowledge.

3.1 Case Study on Two-Way Environmental Management Approaches in Japan

This paper would like to examine how to make partnership with indigenous or local people in Japan and Australia in terms of the experimental pilot program that I and civil engineering expert with local people in Kameoka city, Kyoto Japan have been conducting since 2012. We have utilized a murmuring sound from some streams of the Inukai River or a supersonic sound for water quality improvement.

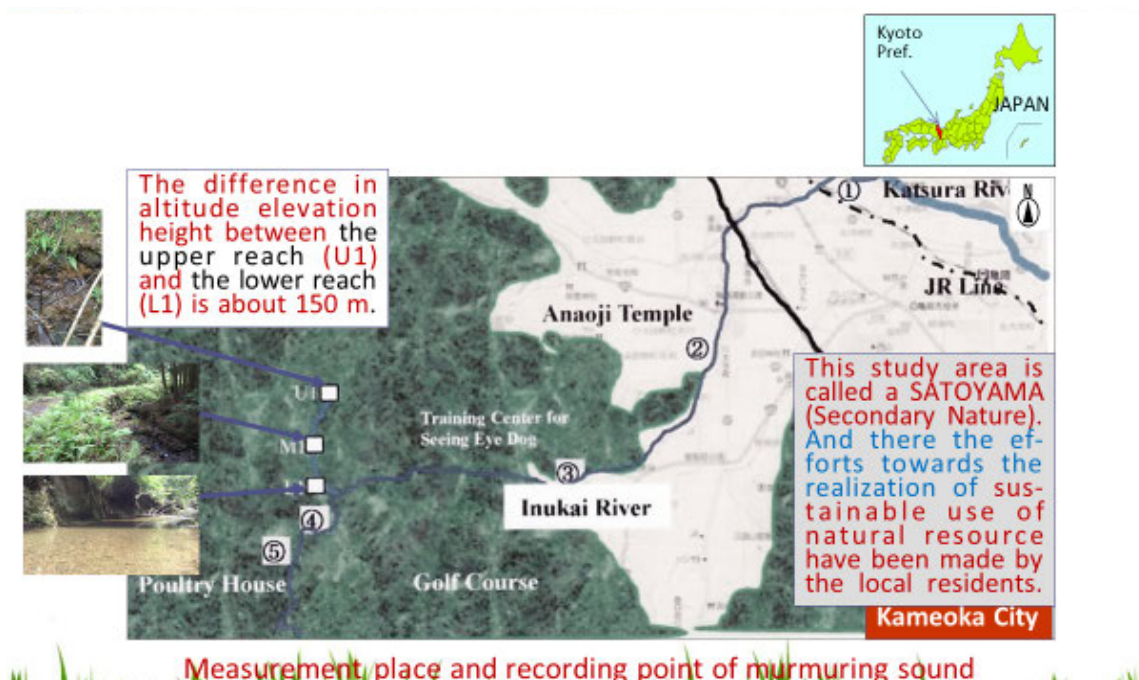


Figure 2. Measuring of the murmuring sound in the stream in Kyoto pref., Japan

3.2 Water quality improvement by sound waves in Japan

This study area is called a SATOYAMA (Secondary Nature). There the efforts towards the realization of sustainable use of natural resource have been made by the local people. The efforts by local people can be seen in the stone monument built in 2006. There is a special word “onko keisui”, which means that “studying past and respect water” engraved in the monument. Since 2007 I have moved to the area and joined a member of Satoyama forest owner association. Since 2012 I and colleague have reached the partnership with local people for collecting the water sample from three sites (Lower reach, Middle reach, Upper reach) in the Inukai River and recorded the sounds from same sampling sites to inquire the water quality improvement by a sound wave.

3.3 Relationship between Sound Waves and Water Quality Improvement

The sampling water collected from lower reach stream exposed to the murmuring sound at upper reach stream in 30 and 60 minutes. As a result, 4 out of 11 main items measuring water quality had positive chemical reaction.

Test Sample →	Forest water in Kameoka city (Lower reaches of stream)		
Water Quality ↓	Before	Exposed to murmuring sound (30min.)	Exposed to murmuring sound (60min.)
TH (mg/L)	10	20	40
pH	7.5	7.5	8.0
COD (mg/L)	3	2	2
Mg ⁺ (mg/L)	1	2	2
Ca ⁺ (mg/L)	10	15	15
SiO ₂ (mg/L)	15	15	15
NH ₄ ⁺ (mg/L)	0.26	0.26	0.26
NO ₂ ⁻ (mg/L)	0	0	0
NO ₃ ⁻ (mg/L)	4.3	2.2	1.5
PO ₄ ³⁻ (mg/L)	0.3	0.3	0.3
BOD (mg/L)	1	0	0

Figure 3. Positive chemical reaction of main items on water quality

3.4 Implication

Since 2013, my colleague and I have provided an environmental study work shop for local kids by application of ultrasonic waves for improvement of water treatment with supersonic cleaner and the nitrate-N pack test kits. We are asking local kids and their parents to make a text book on their Inukai River story. Key words of this workshop was as follows: 1) “Visualization of

water quality”, 2) “Awareness to water quality” and 3) “Action for conservation of water quality”.

In the same year august, we had an opportunity to have workshop with represents from Yorta Yorta Nation Aboriginal Cooperation and staff from The Goulburn Broken Catchment Management Authority to consult any possibility to take two-way ecological management approaches with them through the project of water quality improvement by sound.

The Japan government gives approximately AU\$ 45,000 as the Grant-in-Aid for Scientific Research to the 3-year program and the Ryukoku University I belong also grants AU\$ 20,000 for 2-year program.

4. Two-Way or Multiple-Way Environmental Management Researches

In conclusion, in consideration to two way or multiple-way environmental management researches, it is necessary to analyze the different thoughts and ideas of stake holders and reach the mutual understanding beyond the ideology. Without the mutual understanding, it is incapable to recognize how important the Indigenous Traditional knowledge is and how it has been transformed and invented by the collaborative management methods. Because environmental issue is universal agenda, I am negotiating with not only Indigenous Australian but also Indigenous Japanese Ainu, if our pilot program will take place as multiple way environmental management programs.

Conclusion

This is a challenge to achieve the transformation of multinaturalism (natures) in multiple forms of epistemology(cultures) in Anthropocene epoch. we can reach a new paradigm through the collaborative work with local people and others. On the process to create a paradigm, ethnography can play a significant part in building the bridge among the various actors, that is, dialogic space among the stake holders.

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