

**‘Shared values’ in Driving Local Community Participation in Integrated Watershed Management: The Heartware Approach**

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**Abstract**

‘Governance’ within Integrated Water Management (IWM) can be defined more inclusively as a gradual, continuous and holistic process of short, medium and long-term decision making that takes into consideration the on-going conflicts, competition and resolutions between various groups that has a stake on a watershed . A key element within this inclusive approach of governance is its increasing recognition in dealing with Heartware (stakeholder and community willingness to cooperate) - in addition to the ‘hardware’ (science and technology) and ‘software’ (policy) aspects of governance. Some have even argued that any hardware and software would not be sustainable without enough heartware to drive its development.

Although inspiring, available lessons in incorporating elements of heartware in the governance of IWM are mostly derived from the experience of other countries and its usefulness may be dependent to the countries’ respective contexts. Historical context, economic priorities, political culture, religious beliefs and socio cultural diversity are some of the characteristics that may differentiate the potential responses of the different society in dealing with Heartware. Therefore, although one can take inspiration from the experience of others, it is still very important to explore the extent to which the heartware approach in IWM is useful when applied within the local context. Based on these reasons, a study has been conducted by the researchers to explore elements of shared local values in the context of a watershed village community in the State of Selangor, Malaysia. We hope that the findings can provide preliminary insights on how far the heartware approach can be useful within a local context.

(259 words)

## KEYWORDS:

Heartware, Integrated Watershed Management, Shared Values, Local Community Participation

## 1. Introduction

‘Governance’ within Integrated Water Management (IWM) can be defined more inclusively as a gradual, continuous and holistic process of short, medium and long-term decision making that takes into consideration the on-going conflicts, competition and resolutions between various groups that has a stake on a watershed . A key element within this inclusive approach of governance is its increasing recognition in dealing with Heartware (collective willingness to cooperate between stakeholder) - in addition to the ‘hardware’ (science and technology) and ‘software’ (institutions, policies, participation, information and financing) aspects of governance (Nakamura, 2013). Some have even argued that any hardware and software would not be sustainable without enough heartware to drive its development<sup>1</sup>. Such perspective is in line with the participatory governance perspective which emphasizes the need for higher public participation and stakeholder cooperation in the governance of IWM (Carr et al., 2012; German *et al.*, 2007). Indeed, participation is also a fundamental component of the bigger agenda of sustainable development (Dovers, 2005: 143), and the application of participatory approaches in the governance of natural resources like IWM is key to its realization (Duraiappah et. al, 2005).

As a working concept, heartware deals with the more subjective, human-centered<sup>2</sup> dimension of IWM that taps into the collective willingness of different stakeholders to “cooperate” in solving complex problems related to IWM. Heartware can start from a simple feeling initiated by strong emotion or thoughts, and subsequently evolve into a motivation to start corrective actions to cure problem(s) – all with the goal of eventually reaching a satisfactory decision and solution regarding a common issue. Heartware can be

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<sup>1</sup> This was the general perception during the ILBM Heartware Group Expert Meeting held recently.

<sup>2</sup> marked by humanistic values and devotion to human welfare.

a difficult issue to define and can be very broad, being at the same time a feeling, a conclusion and/or an incentive or disincentive for needed or desired actions. This definition was taken from a summary note prepared by Prof. Walter Rast (2013) on the initial thoughts on the Heartware concept, discussed during the Integrated Lake Basin Management (ILBM) Heartware expert group meeting held on 5-10<sup>th</sup> March 2013 at the International Lake Environment Committee Foundation (ILEC) HQ in Shiga, Japan.<sup>3</sup>

Within IWM itself, the concept of Heartware (to our knowledge) was only recently incorporated into the ILBM framework. ILEC that leads the global community in developing and implementing the ILBM framework is currently undertaking a collaborative and interdisciplinary research on “Heartware” under a programme funded by the Japanese Ministry of Education. This intellectual move is being driven by the increasing recognition by the ILBM epistemic community on the importance of heartware as a key integrative and sustaining component of the IBLM framework. It is unclear however, how far ‘heartware’ as an explicit concept has been used in other frameworks in IWM<sup>4</sup>. However through its broad definition, we believe that the concept of heartware introduced within ILBM can provide a useful umbrella conceptual framework to a number of related concepts already used in the broader IWM literature, such as value-focused thinking, social learning, collaborative learning and adaptive co-management (Table 1).

**Table 1:**  
**Existing concepts in the IWM literature that are closely related to the concept of Heartware**

Concepts	Brief description	References
<b>Value-focused thinking</b>	A proactive approach of watershed management that starts by considering on what it is that a watershed community wants – their values – and then move to how they can get it, their alternatives. In this manner, management may become less encumbered by the constraints that seems so burdensome, and better achieve the objectives.	Merrick and Garcia, 2004
<b>Traditional Ecological</b>	A cumulative body of knowledge and beliefs, evolving through adaptive processes and handed down through generations by cultural transmission,	Olsson and Folke (2001)

<sup>3</sup> ILEC, to date, has organized three series of ILBM Heartware Group Expert Meeting. The second meeting was held recently between 5-10<sup>th</sup> of March at the ILEC HQ in Shiga, Japan. The lead researcher for this study were invited to attend the workshop as a part of their capacity building under the Asia Core programme.

<sup>4</sup> IWM has different types of framework based on spatial or analytical focus that is of interest to different epistemic and practitioner community. This includes Integrated watershed management (IWM), Integrated River Basin Management (IRBM), Integrated Lake Basin Management (ILBM) etc.

<b>Knowledge (TEK)</b>	about the relationship of living beings (including humans) with one another and with their environment	
<b>Local Ecological Knowledge (LEK)</b>	Knowledge held by a specific group of people about their local ecosystems. Because it is labeled “ecological,” it concerns the interplay among organisms and between organisms and their environment. LEK may be a mix of scientific and practical knowledge; it is site-specific and often involves a belief component.	Olsson and Folke (2001)
<b>Social learning</b>	Social learning happens whenever people with different interests, perceptions and resources come together and handle an issue which they all have a stake to everybody’s satisfaction.	Mostert, 2006
<b>Catchment volunteering</b>	A wide range of experiences, as it is undertaken in rural, regional and urban settings, by a diversity of individuals for a variety of reasons. It involves activities such as water quality monitoring, tree planting, weeding, mulching, watering, and cleanup days	Gooch, 2003
<b>Catchment volunteers</b>	An individual in a not-for profit group and/or program that has a catchment focus, whose activities are intended to benefit both the community and the volunteer. The volunteer undertakes the work of their own free will for no financial recompense and in a designated volunteer position exclusively.	Gooch, 2003
<b>Adaptive management</b>	Adaptive management involves combining, in a dynamic ongoing process, local and scientific ecological knowledge in the co-management of resources and ecosystems. For this process to work, knowledge and understanding of complex ecosystem dynamics needs to become embedded in a network of institutions that can interpret and respond to environmental feedback.	Olsson and Folke, 2001
<b>Co-management</b>	A management strategy to achieve joint responsibility and authority for resource management between different organizational levels in society, for example, between local resource users and the state level	Olsson and Folke, 2001

Source: Own

By recognizing the critical role of heartware, the governance of IWM therefore must include the process of mediating different prioritization of values placed on the watershed by different stakeholders (Water and Culture Institute, 2012). This is because the complexity of decisions about how best to improve a watershed can be conflicting, as stakeholders often have varying viewpoints about what is important in managing a watershed, and about the projected outcomes and consequences of actions taken (Jason and Margot, 2004). As listed Box 1, these values can be divided broadly into major function of the watershed (Hirayama et. al, 2011), while the prioritization of these values can differ at different levels of society - be it individual, household, communities, state and national; influenced by various sources of knowledge, be it scientific, technical, aesthetic, cultural, spiritual and religious (Botzler and Armstrong, 2003) and at different depth of ethical stance, deep, intermediate and shallow (Vincent, 1993; cited from Carter, 2007). In short, prioritization of values can be driven by a complex amalgamation of factors.

## **Box 2: Evaluating people's value of a watershed: The functional approach**

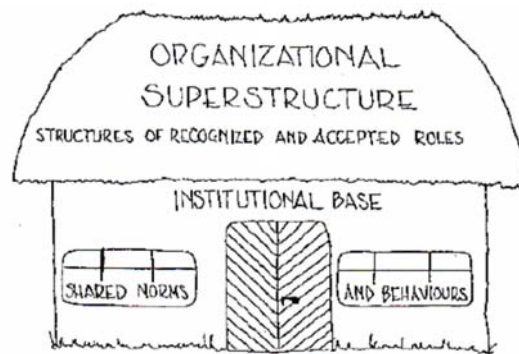
Values based on five major functions of Lake Biwa:

- (1) Value as water resource (domestic, agricultural, industrial, flood control)
- (2) Value as ecosystem (habitat of plants and animals)
- (3) Value as landscape (beautiful range of mountains, lakefront vegetation, swimming waterfowls)
- (4) Value as lifestyle (leisure, food culture, traditional festivity, research, education)
- (5) Value of industry (fishery, lake transport)

Source: Adapted from Hirayama et. al (2011)

One way forward in this process of heartware mediation is using a value-focused thinking i.e. by starting from the prioritization of values that are more commonly shared by different stakeholders. This is because shared values can be used to solidify a community's sense of vision, trust and engagement with each other, and drives them to cooperate towards a common goal – hence providing a stronger basis for social/collaborative learning and adaptive co-management in IWM.

As suggested by the “House Model” by Fisher (1993, cited in Chandrasekera and Wijayaratna, 2004), agreed rules, shared values and shared behaviors can be seen as an institutional base (the walls of the house). This base must always be present (there must always be agreed rules and shared behaviors, or nothing will happen in terms of collective action). The roof of the house represents an “organizational superstructure” made up of roles such as committee member, chairperson, or watershed volunteers. This superstructure can be different in shape in different cases and may sometimes be missing. In promoting community participation, the walls are essential. The roof cannot be built without the walls and is not always necessary. To take the analogy further, in the case of sponsored systems (e.g. IWM citizen science initiatives) emphasis is often placed on building the roof, but not much effort is put into recognizing or building the walls needed to support the roof.



**Figure 2: A House Model of Indigenous Resource Management Systems**

Source: Adopted from Fisher, 1993; cited from Chandrasekera and Wijayaratna, 2004

In the context of Malaysia, C=current discourse and style of governance in Malaysia is largely centered on the hardware and software aspects of IWM, and mainly concentrated at the national and state level of governance (LESTARI, 2013; NAHRIM, 2013). Less attention has been given to the perspective of the local community and their shared values in IWM, demonstrating a gap in our understanding and appreciation of the heartware aspects in Malaysia. This is important to highlight, since IWM literatures on the experience of other countries such as Japan, Europe, Australia and Northern America (Hahn et. al, 2006; Mooney, 2012; Ivey, Kreutzwiser and Ferreyra, 2006; Lansing and Erazo, 1998) has demonstrated that a more nuanced understanding and recognition of shared values at the community level could improve public participation in IWM, and contribute to more effective and targeted strategies. In fact some have even argued that the lack of a sense of community may be the single most important barrier to successful long-term watershed planning and implementation (McGinnis et. al, 1999).

This is evident for instance, from the experience of IWM of Lake Biwa in Shiga prefecture, Japan where elements of heartware such as local traditions, folk stories, unique sense of local community, citizen volunteerism and historic memories of human-nature relationship have contributed to increased and proactive citizen participation and support in the protection of the Lake Biwa watershed. In fact, the role of these heartware elements was highly recognized through its explicit inclusion in the Lake Biwa “Mother Lake 21 Plan” (ML21) policy document (Shiga Prefectural Government, 2000). For a more

comprehensive reading of the Lake Biwa heartware experience, please refer to Nakamura et. al (2012) .

Although inspiring, available lessons in incorporating elements of heartware in the governance of IWM are mostly derived from the experience of other countries and its usefulness may be dependent to the countries' respective contexts. Hence, the heartware approach in Japan for instance cannot be considered automatically applicable to a country like Malaysia where the socio-economic and socio-cultural characteristics are very different. Historical context, economic priorities, political culture, religious beliefs and socio cultural diversity are some of the characteristics that may differentiate the potential responses of the Malaysian and Japanese society in dealing with Heartware. Therefore, although one can take inspiration from the Japanese experience, it is still very important to explore the extent to which the heartware approach in IWM is useful when applied within the Malaysian context.

Based on these reasons, this paper began its exploration by identifying heartware elements in the form of shared local values within the context of a village community within a specific watershed in the State of Selangor, Malaysia i.e. the Selangor River downstream community of Mukim Pasangan.

## **2. Research strategy**

### *2.1. Appreciative Inquiry*

The research has applied the appreciative inquiry (AI) approach as a proactive strategy to uncover elements of shared values in this paper. The appreciative inquiry refers to an organizational and social change approach that identifies peak moments within a community and reinforces conditions that make past achievements possible (Cooperrider and Srivasta, 1987). AI has also been described as:

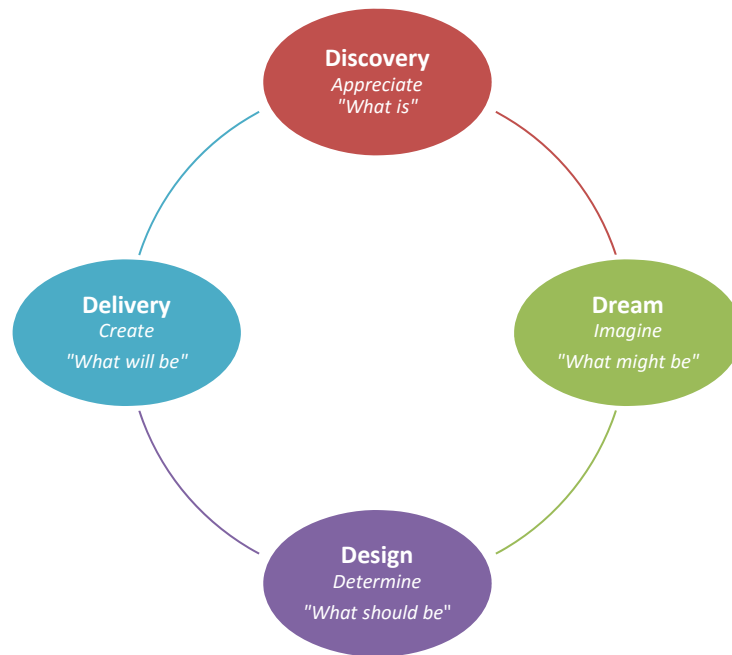
... the cooperative co-evolutionary search for the best in people, their organizations and the world around them. It involves the discovery of what gives life to a living system when it is most effective, alive and constructively capable in economic, ecological and human terms. AI

involves the art and practice of asking questions that strengthen a system's capacity to apprehend, anticipate and heighten positive potential. The enquiry is mobilized through the crafting of the "unconditional positive question [...] AI interventions focus on the speed of imagination and innovation – instead of the negative, critical and spiraling diagnoses commonly used in organizations. The discovery, dream, design and delivery model links the energy of the positive core to changes never thought possible (Cooperrider, Whitney and Stavros, 2003)

Instead of starting at the level of key problems, the AI framework known as the "The 4D Model" (Figure1) starts by appreciating the process of "Discovery" – where researchers try to discover the best moments and memories in the history of the community and its people. The second stage "Dreaming", builds on these exceptional life moments to envision what the community could be in the future. Then the framework moves to the more practical phase of "Designing" the future envisioned by the community themselves, and finally, to agreeing on each person's role for the "Delivery" phase. As highlighted by Hammond (1998, p.21), AI helps a community to "journey into the future, while carrying the best parts of the past".

Hence, AI is a suitable tool to discover inspiring shared values appreciatively from the ground up, and to highlight these values as a way to assist decision makers to approach the governance of IWM in a more inclusive, visionary and proactive manner. In principle, by highlighting values that are not only shared but also inspiring in its genesis, the study has more potential to come up with findings that could encourage proactive and creative participation and innovation by the community in the subsequent dreaming, designing and delivery phases of AI. Indeed, this approach differs from the more neutral approach that focuses on the mere identification and categorization of people's values or the problem-solving approach that focuses on the negative or problematic side of public participation in IWM.





**Figure 1: The 4D Cycle of Appreciative Inquiry**

## 2.2. Data collection and analysis

The research uses a semi-structured and open ended interview as its main method. The interview protocol was crafted using the appreciative inquiry approach, as described earlier. The interview was conducted in the local language (Bahasa Malaysia) and the interviewees consist of community leaders and focus groups representing key groupings in the community (e.g. youth, women, religious, fishermen, boatmen etc). This research however is only limited to the “Discovery” phase of the appreciative inquiry framework, rather than the whole 4D Cycle. This is because the goal for this research is to identify the shared values that can be used as elements to support the heartware process, rather than conducting the process itself. Our intention is to ‘be a part of, rather than ‘creating’ a cycle of social change’, at least for present period of the research. However, the long term vision of this research is to complete the cycle

Hence, the interview questions would need to be centered on the key elements of the Discovery phase: appreciating “the best of what is” within the community and how this

could translate into positive attitude and behavior for enabling more effective IWM for the Sungai Selangor watershed. With this orientation as guidance, a list of issues of IWM in Kg. Kuantan was identified and these are then developed into appreciative questions. This approach of focusing on the Discovery phase is similar to the work done by Michael (2005) in using AI to discover the power of 60 local African NGOs and using the findings to improve their role in Africa.

The whole interview was fully recorded using a voice recorder, and visually captured using a camcorder and camera. These materials were then presented to the community and other stakeholders to highlight the heartware potential of the community. This will hopefully provide the community and other watershed stakeholders with a better foundation to move forward in the subsequent phases of the AI cycle of the Sungai Selangor IWM: dream, design and delivery.

We hope that the findings can provide preliminary insights on how far the heartware approach can be useful locally. It needs to be recognized however that our research is by no means sufficient to provide a holistic understanding on the local application of heartware. Identifying shared local values is just a starting point, and its usefulness for the heartware approach in this regard can only be determined when the shared values is translated into proper programmes and tested organically and consistently within the broader governance strategy and decision making process.

### **3. Results**

From this preliminary research, we have identified a number of shared values that have been expressed by the downstream Mukim Pasangan community from an aspirational viewpoint. These are then further refined in Table 2 based on the ‘functional values categorisation’ described earlier. Each shared values are then elaborated accordingly. The paper will end with some discussion and conclusion on these findings and how it relates the Heartware potential of the case study community.

**Table 2 Shared values identified at the Mukim Pasangan Watershed community according to functions**

Categories of shared value	Sub-categories
Value of industry	<ul style="list-style-type: none"> <li>• Ecotourism (firefly) - boatmen</li> <li>• Freshwater fishery</li> <li>• Crafts</li> <li>• Local food</li> </ul>
Value of ecosystem	<ul style="list-style-type: none"> <li>• Habitat of plants and animals</li> <li>• Reverence for nature and environmental ethics (<i>adab</i>)</li> <li>• Local knowledge</li> <li>• Nature conservation (e.g. sustainable fishing, replanting)</li> </ul>
Value of lifestyle	<ul style="list-style-type: none"> <li>• Transportation in the past</li> <li>• Source of food and water</li> <li>• Artistic expression</li> <li>• River as a playground</li> </ul>
Value as landscape	<ul style="list-style-type: none"> <li>• Feeling of connection with the river</li> </ul>
Value as water resource	None

### 5.1. Value of industry

An elder in the community realized the value of fireflies in generating income through ecotourism and he started the firefly tourist business about 3 generations ago. This has a big impact until today – whereby, the main economic activity for the locals is to work as pendants (rowers) and boatmen to bring tourists around the river every night to witness the spectacular showcase of fireflies gathering along the river. With the increase in tourist activity at the firefly jetty, some locals have taken up the opportunity to sell crafts and food at the jetty. However the business now has been taken over by the municipality and as a result, the community has less control now in the operation of the ecotourism business and feeling rather disenchanted. The majority of the Indian community that lives further away from the river feels that they do not benefit economically as most of the profit goes only to the pendants, who are all ethnically Malays.

In the past, other sources of income can be easily obtained from the richness of the flora and fauna at the river. Nibong trees were aplenty back then and can be used or sold as pillar for houses. There used to be a local industry of *kelapa salai* (coconut oil) for cooking and pomade. Nipah and rumbia fronds from the palm trees can be used to make traditional roof for houses. Though the locals admit that the craft of nipah and rumbia roofing is not a profitable business, many continued the tradition to sustain the culture and to help lessen the economic burden of their family money-wise. This local business has ben sustained until today and is even gaining back its popularity among restaurants. The nipah fronds found along the rivers are also being used as casings for a local delicacy called “*otak-otak*” and some of the locals are being paid to process the leaves. Freshwater fishery (fish and prawans) also used to be a lucrative business in the past, but now reduced to side-income and recreational activities. The decline is mainly due to the depletion of natural resources along the river, plus the lack of interest by the younger generation to be involved in such activities. Most prefer white and blue collar job in the towns.

### 5.1. Value of ecosystem

The Selangor River has been blessed with the growth of *berembang* trees as the main source of food for the fireflies. Before the fireflies gained its popularity among the tourists, freshwater fish, giant prawns and crocodile were the main attraction among the locals. Over the years, the prawns and some fish species have suffered greatly from human activity such as overfishing, oil palm plantation and intrusion of salt water from the sea after the Selangor River dam was built. The local also expressed their concern about the riverbank erosion. They observed that the meandering structure of the river caused greater erosion to the river bank, leading to increased turbidity, lower water quality and reduced population of certain freshwater fish.

Those who lived downstream understood the concept of ‘take only what you need’. Up until the 1990s, river fish and giant prawns were never caught in excess and the juvenile fish or prawns were always released back into the water. This responsible fishing practise ensures the population of the freshwater fish and prawns were always sustained. However,

cases of overfishing at the upstream have caused the deteriorating numbers of freshwater fish at the downstream. The locals also show respect to the need of other creatures living in the river, namely the fearsome crocodile. They believe that if the crocodiles do have enough food, they might go on a rampage.

As an expression of their respect for nature, there are a few rules or *adab* that this river community have put in place. For example, they must not dangle their feet or playfully put their hands into the river water in fear that it might get bitten by snakehead fish. They should also take off their shoes before getting inside the sampan. The word “buaya” (crocodile in Malay) is never used by the local. It is said to be a taboo to mention the name and anyone gutsy enough to mention the word “buaya” at the river is said to be a foolish act of summoning the creature. To show respect, some folks believe that by asking permission from the crocodile to enter the river for fishing activity, no harm will fall on them. The act of slamming clothes against logs while washing clothes at the river is said to produce sounds that might agitate the crocodiles and are forbidden by the housewives. Even floor mats are not allowed to be washed and spread to dry at the river.

Some of villagers have also shown their passion to the river by working as a rower or *pendayung*. Taking the tourists by using a sampan is one of the ways to ensure that the river will not be heavily polluted as compared to when using a motor boat. The *pendayungs* believe that the quietness and the darkness from not using boat lights while rowing a sampan will not scare away the fireflies. They also respect the fireflies in its natural habitat; it is forbidden to take the firefly’s pictures or use torchlight on them as they are a sensitive creature. The *pendayungs* have also raised various issues about the fate of the river when they notice the population of fireflies have gone down after a land clearing around the year 2008.

The locals know a lot about the river. They know for instance that the only time the river is clear is when the canal water is released or after heavy rain at the upstream. According to them, flooding often occurred in the past but has reduced after a canal was installed in the

70s. The changes in the river water colour can indicate the type of fish or prawns hiding underneath. They know many things about the aquatic animals such as the know-how to catch prawns and some types of catfish tastes better. The locals use crocodile as an indicator of a healthy ecosystem, saying that rumbia leaves (which are hard to find in abundance nowadays) can be found where the crocodile lives. They know the best time to see the fireflies. 'Bulan gelap' when the moon is covered by clouds is the best time for fireflies compared to 'bulan terang' (when the moon is clearly visible). The peak time for the fireflies is between 8pm to 10pm. They also know the importance of the berembang mangrove tree to the fireflies - if it is a healthy berembang (which they know how to identify), a lot fireflies will feed on it.

### 5.3. Value of lifestyle

In the past, the river played an important part in the local's daily lives. Back when there were settlements on both sides of the river, the river was a major method of transportation for them. Most of the houses situated nearby the river owned a sampan. Neighbours used to send their children to school using a sampan, forming a space for socialisation. The mosque as a place for worship was built next to the river. Back when the sampan was still the main mode of transportation for the locals, it was a perfect location for the congregation as many of them still lived across the river. Even prayers for Hari Raya were pushed later at 10am instead of its usual time at 8am to wait for people to arrive using the sampans. The location also made it easy for the congregation to take *wudhu'* (ablution) from the river. Before there was pipe water supply to the houses, the locals also used to bath, wash clothes and drink directly from the river.

The older housewives were also very adept at utilizing nature's gifts into making traditional local food. Some of their famous dishes are *ulam berembang* from berembang mangrove tree eaten with local made sambal, freshwater *putat* fruit eaten with coconut sambal, prawn rendang and ikan patin (catfish) cooked with tempoyak. During wedding ceremonies, old timers such as Atok Zakaria would play dabus (a traditional Malay musical instrument) while harmonizing words from Buku Berzanji which mostly consist of

*salawat* (salutation) for the Prophet or his composition about the environment, fireflies, Bukit Melawati and even the history of Selangor.

In the past, the locals used all the natural resources around them to make their lives easier at home. The nipah and sago palms were abundant in the past and had many uses: from the making of traditional roofing using the fronds to making pail using the leaves. The leaves can also be weaved into making dulang and containers as wrappers for local delicacies. The fruits of berembang tree can be used as bait to catch freshwater catfish and the new leaf shoots can be eaten as *ulam* (salad). The river water can be used as drinking water after it has been put inside a *tembikar* (pottery) and filtered using *tawas* (a type of mineral salt used to increase the rate of sedimentation). One local Malay elder often talked about how easy it was to catch giant prawns when she was a little girl. She would go to the water channel behind her house and easily scoop the prawns using a net. Similarly, an elder from the Indian community described how easy it was to catch fish using a bamboo stick as a fishing rod when he was a child.

A number of adult males also remembered how the river was like a “playground” in the past where they could go diving and enjoyed swimming competition with friends. The younger generation in the community still enjoys catching fish in the river and taking baths in the smaller water channels, but most are prevented by their parents to swim in the river itself for security reasons – either from possibilities of crocodile attacks or drowning.

#### *5.4. Value of landscape*

The older generation described a different, more beautiful Selangor River landscape than what they can see today. Even though most no longer live near the river, the river is still in their hearts and mind. They expressed their longing towards the river especially after some villagers have to move to a modern housing area further from the river. One of the elders sometimes fought against her aging body and willing to walk a few miles with her friends to reconnect with the river landscape

#### 4. Conclusion

Evidence from the case study has shown that there are a number of shared values for the river that are still aspirational for the Mukim Pasangan downstream community, and has the potential to touch the hearts of the community for IWM. However, only three functions were expressed significantly i.e. value of industry, value of ecosystem and value of lifestyle. Value of landscape was mostly expressed nostalgically by a few individuals, and value as water resource was not mentioned at all.

This is interesting, in the sense that the community does not consciously value the river as a vital source of water in their everyday activities - eventhough stories about the Selangor River being a valuable source of raw water has become a hot topic in recent years. The findings also go contrary to the philosophy of integrated watershed management where water use is closely interlinked with water resource (e.g.. river) management (LUAS, 2014). Without sufficient appreciation by the local communities on this vital connection, it can be difficult to encourage their collective commitment in supporting IWM. Indeed, 'river as a water resource' is a value that has the most direct relevance to all individuals in any community.

On the other hand, the other values (industry, ecosystem, lifestyle and landscape) were mostly expressed as aspirations from the past, with little prospects in the present. The river used to provide lucrative source of income for the community, but this has been mostly reduced to part-time jobs as *pendayungs* for the firefly eco-tourism activity, and few small businesses in food and craft. The river ecosystem used to be filled with diversity of flora and fauna, but this too is increasingly depleted. However, there are certain river etiquettes, local knowledge and small local conservation activities that are still alive and inspiring for the community. In terms of lifestyle, the aspirations mostly comes from past memories on how the river was used as a mode of transportation, source of water and religious inspiration – with some surviving practices in using river resources for cooking and leisure. Also, these shared values were mostly expressed by the elders. The young adults could only reminisce about their childhood memories, while the children & youth were less expressive and have little to say about what they value about the river.



Therefore, we conclude that the heartware challenge in this context is basically to bring back these aspirational memories about the river to the young adults and youth, especially while the elders are still alive. As future decision makers, it is imperative that their imagination is closer to the more natural and inspiring state of the river rather than what they can experience now. As an immediate follow up, we have now extended the current phase of our research to be more translational, with specific focus in documenting these shared values into an affordable coffee table book, and using our current insights to empower key focus groups (namely the youth and mosque committee) to enhance the heartware of the community for IWM.

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