

# From Engagement to Impact: Proceedings of the 1<sup>st</sup> International Research Symposium on Sustainable Rural Built Environments (SRBE), Kuala Lumpur, January 27-29, 2020.

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Editors: Dr David S Jones, Susan Ang and Dr Norwina Mohd Nawawi

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We wish to acknowledge the lands of the Orang Asli Peoples upon which this Symposium takes place in Kuala Lumpur, and their elders past present and emerging.

In additional, we wish to acknowledge all First Nations Peoples, and their elders past present and emerging, whose thoughts, insights, smiles, and friendships interwoven with respectful prior informed consents have contributed to the papers presented at the Symposium and collated in this Proceedings.



Group photograph of most of the participants of the From Engagement to Impact: The 1<sup>st</sup> International Research Symposium on Sustainable Rural Built Environments (SRBE), in Kuala Lumpur, Malaysia.

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# SYMPOSIUM OPENING KEYNOTE SPEECH

# Emeritus Professor Tan Sri Dato' Dzulkifli bin Abdul Razak Rector - International Islamic University Malaysia Office of the Rector, International Islamic University Malaysia, PO Box 10, 50728, Kuala Lumpur, Malaysia

The current events happening worldwide, such as the coronavirus, the bush fire in Australia, the volcano eruption in the Philippines, global warming, and climate change, has created huge challenges ahead of us. But, alhamdulillah, we are able to meet here today, and I do hope the resolution we are trying to cut across will solve some of these problems. Although we cannot do much, it will change our mindset on how to approach these problems. So, the meeting today is a very honourable one. We are indeed very thankful for giving the opportunity to assemble here after ten years of continuous collaborative work. And indeed, the testimony to sustain something for ten years is commendable as, in most cases, halfway, most of these programs will fizzle off. Still, Alhamdulillah, the team are able to maintain the momentum, and I congratulate Deakin University for taking the proactive role and making the Symposium a reality today. This Symposium is only the beginning of a new thing to come.

I welcome you to this University and participate in what we try to conceptualise what the new world is all about. Just last week, UNESCO released another document on what education and the future are all about. This new document talks about technology and, more importantly, how to give back to humanity, especially in humanising education. Until we put human feedback into our system, education will be something else apart from just education. Humanising is part of the challenge the University has taken, which we will announce in months. We have deliberately taken up sustainable development initiatives and contextualised them with constructive stakeholder engagement around the University and its environs. In fact, this has been the agenda of the University. The 2019/2020 enrolment ensures that most of the Kulliyyah will try to translate whatever they are good at into meeting the 17 Sustainable Goals.

I know architecture has Goal 11 and Goal 17, but the challenge of Sustainable Development Goals is connecting all 17 Goals together. It is not good merely to work on one or two goals with the rest not connected. As such, we may be missing out on some essential issues in the context of humanity and human development. We talked about poverty, starvation, and health, and just then, coronavirus suddenly appeared. How will we handle this when we have been so silent in our thinking, our mindset, and how we look at things? The challenge today is how to broaden this whole dimension of education. We are so used to lifelong learning. Yes, recently, the word was introduced. This is about the breadth of knowledge; how much connection can we make? As an architect, all the other disciplines that you are interacting with, can you understand their language? Can you meet up with them and understand where to move forward? I am a science student, a pure science student.

Relatedly, I have a small confession: I wanted to be an architect because I like drawing, Art and stuff like that. So architecture will be my natural destiny, but you know, as life is and when your parents push you to do science. Science was seen as a valid course, and Art is a part of that. Physics and chemistry may be boring, but when I talk to you, I think of what matters now, like how do you make this connection between all the percentages? And this is a university with 17 Kulliyyahs, and now each is making connections with one another. So how do we connect this and make it a single entity as far as education is concerned? Education should not be about just publishing papers and not advancing them into something that could be beneficial to the people around you. And this, I think, is the new way of thinking—the new way of putting education in the context of sustainable development.

I am particularly interested in this whole concept of rural development. This concept is another dimension that we are facing now. All of us are talking about technology and moving forward in an organisation. What happens to rural areas, and what happens to those, not in that category of the targeted

people? In this University, we call ourselves an International University, and we have no problem with it, but my question to my colleague university is, what happens to our backups? What happens to the communities around us? There is a huge group of Indigenous People around here. How do we attend to them? Are they part of the mainstream? Are we interacting with them? These are the more significant issues we are now facing while we try to reshape this University in this direction. So I am pleased and delighted that you are here re-conceptualise some of these ideas. I am sure there are many things we can learn, and this exchange is welcome. I also hope this is another journey you will take for another decade. Hopefully, by then, we will see some remarkable change, not only in our thinking but also in reality, in how we save the world as it works moving forward in the 21st century and beyond. So I believe this Symposium is a culmination of 10 years of work of the 12 design discourses or workshops of inter-cultural dialogue through design. With this, Deakin University has relentlessly partnered with other universities and taken the mission of sustainable development and a good environment in the rural region.

As an Islamic university, culture is an important context. We translate Islamic worldviews and Islamic perspectives into what sustainable development is all about. And if you have heard the University's song, it is how we have placed several important keywords for us. One is "Rahmata-l-alamin", which means "Mercy to all the worlds". In other words, this University's reason is not just to serve the Muslim ummah but the whole of humanity. We talked about human lives – the Muslims and the non-Muslims; we also spoke about lives beyond non-human. The animals, the plants, trees, and hence this garden of knowledge and virtue. What does this mean to us in the context of sustainable development? It is not just a garden; it is a garden from which we can draw inspiration. It is a garden that we need to sustain, and hence one of the projects that we have in a big way in this University is to grow a 'garden'. Now, most of the Kulliyyah have a garden project of their own and translated it into something entirely new as far as a garden is concerned-not, only as something we admire but to participate in. The other word in the song is the word "Amanah". Amanah means Trust. In retrospect, all these things we enjoy today are a kind of Trust given to us, and we need to return this Trust immediately to the younger generation. How can we return this Trust to them if the world is messy and chaotic? Thus, we need to be responsible and accountable for them. And then, the word "Trust" means a lot more things to us in trying to shape things in the way they used to be and how to return this Trust to the younger generation so they can move forward. Another word is "Khalifa". Generally, we translate it as "stewardship and leadership". We need to take that leadership and stewardship to another level so that whatever we plan is something we realise and focus on regularly or practically. And the last word in the song is "Iqra". Iqra' is about "recitation, reading, reflection, and realising it". How can we turn Iqra' into something other people can benefit from? So, from that song alone, how do we dwell deeper into this idea of sustainable development and make it a global concept so that many more people can participate in making sustainable development a fundamental goal in their lifetime? That is the challenge that should be in front of us.

So, ladies and gentlemen, thank you once again for taking the time to come. I know the journey is not easy, but I am happy to see you here. I hope this relationship will go on forever so that we can be a community of human persons with hope and interest in developing the future so that the future can be the future that will be sustainable for all, particularly for the generations to come.

On that note, on the recitation of "*Bismillahir Rahmanir Raheem*", I thereby open the inaugural International Symposium on Sustainable Rural Built Environment, and I wish you all the best. Thank you.

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# **Symposium Proceedings**

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# SOLAR ENERGY FOR ORANG ASLI HOME IN THE HIGHLAND

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Abstract: Access to electricity supply has becoming major issues in rural areas in Malaysia. Thus, a simple and practical solution by harvesting electric through solar energy is an answer towards this unresolved problem. It is also a sustainable solution in line with Sustainable Development Goal number seven which highlighted the access to affordable, reliable, sustainable, and modern energy for all. This research investigates capability of solar energy to supply electricity for Orang Asli homes in the highland and evaluates the satisfaction of Orang Asli towards the solar energy supplied to their home in the highlands. Kampung Orang Asli Rening, Pos Telanok, Cameron Highlands, Pahang Darul Makmur has been selected as the site as this village fulfil the criteria needed along these studies. The experiment simulation has been conducted using an online web application name Photovoltaic Geographical Information System (PVGIS). The analysis reveals that the existing solar panel that had been installed are not capable to supply adequate amount of electricity for their home to meet its electricity demand 22 respondents participated in survey questionnaire show that only 13.6% of them satisfied with the current solar panel installed there while 86.4% are not very satisfied with the solar panel. Moreover, with one solar panel that have been installed in each house currently, PVGIS identify that this insufficiency can be resolve by providing four same solar panels to optimise electrical supply to one Orang Asli home. This dissatisfaction also may be due to the photovoltaic panel that did not function well due to lack of regular maintenances causing power output reduction and short circuit in the system. All these issues resulted in majority of the villages are not satisfied with the solar panel installed. In conclusion, each Orang Asli home need four solar panels to meet their daily electricity demand.

Keywords: Solar energy, photovoltaic panel, sustainable, Orang Asli home, highland, electric

#### **1.0 INTRODUCTION**

Sustainable Energy Development Authority (SEDA) highlighted five major types of renewable energy resources under the Feed-in Tariff Portfolio which are solar energy, biogas technology, small hydropower, biomass technology and geothermal. (Kabir, Kumar, Kumar, Adelodun, & Kim, 2018) stated that solar energy exhibits the highest global potential than biomass as its supply is not ubiquitous in nature and limited sources of geothermal to a few locations. Solar energy is plenty, costless and clean which does not make any sound or any type of harm neither to us nor the surrounding environment (Hossain et al., 2011). Research by (Solangi et al., 2015) find out that solar energy is part of the most famous renewable energy among Malaysian. Solar energy is commonly used and the most devoted answer to produce energy in confined or remote areas as it is available throughout the year even in hot and humid climate of Malaysia.

Throughout this research, the author will analyse the feasibility of renewable energy specifically in solar energy to use for the community in Kampung Orang Asli. Since independence in 1957, Malaysia has undergone major demographic and socioeconomic changes that have led to significant improvement of access to electric. However, access of electricity especially in rural area is still concerning us. Rural area is hard to access by main electrical grid and lack of maintenance are part of the factor contributing to the lack of access to electricity. In relationship with United Nation Sustainable Development Goals under Goal number seven highlighted the access to affordable, reliable, sustainable, and modern energy for all, solar is one of the sustainable solutions towards the issues of rural electrification. Thusly, solar energy most can be considered as intelligent solution to produce energy in isolated or remote areas indirectly solve rural electrification issues.

Today, the increase of price on fossil fuel and unforeseeable varying diesel price is one of the major issues face in any country in their financial aspect It is expected that the earth will only preserved about 122 years for coal, 42 years for oil and 60 years for natural gas according on current reserves and consumption (Lior, 2011) & (British Petroleum, 2008). Global Greenhouse Warming mentioned in their article that it is crucial and vital for us to cut our dependency on fossil fuel as this will become one of the solutions for 80% of global warming phenomenon. This unstoppable consumption will affect in critical climate change, higher production on Greenhouse gasses (GHs) such as carbon dioxide (CO<sup>2</sup>) and carbon monoxide (CO), increasing of temperature by 0.76 °C and global warming. It is devastating that the warming average rate over the previous 50 years was approximately twice for the last 100 years. Thus, all of these data indicate that our world is critically in need to use renewable energy as main sources of energy. Solar energy through photovoltaic panel considered one of the smart way practice sustainability in our daily life.

World Bank reported that the access of electricity in rural areas decrease from 77.911% in 2015 to 77.481% in 2016. The Rockefeller Institution stated that an estimated 16 percent of the world's population about 1.2 billion people have little or no access to electricity. This is crucial as the dependency of electric in our daily life is important to fulfil our needs. World average growth rate estimated at 2.8% in 2020, the electricity demand is expected to be doubled. Thus during this period, the electricity demand especially in developing countries is predicted to increase by 4.6% annually (Ibrahim, Anisuzzaman, Kumar, & Bhattacharya, 2002). The relationship between electricity and solar energy in the rural area cannot be separated as both elements are connected to each other. Hence, the usage of solar energy to equip Orang Asli home in the highland would be an interesting topic to be discussed throughout this research project. Malaysia has a population of 32.3 million of which 44% resides in rural areas (Ariff & Teng, 2002). The enhancement of electrification in rural area in the community should be a compulsory mission in every country with clear vision to help people that are in need.

#### **2. LITERATURE REVIEW**

#### Solar Energy in Malaysia

According to the magazine by Energy Commission, 2017, under the topic of Malaysia's Electricity Generation Capacity, Demand and Reserve Margin. It is stated that Peninsular Malaysia, generate 22,919 MW capacity of electricity with 17,788 MW at peak demand and this resulted with reserve margin of 29% (Commision, 2017) also stated that along with a depletion of fossil fuels the energy costs will increase annually, this will affect a nation to sustain a stable development as everything will be more expensive. Hence, it is crucial to take the mandatory and indispensable action to establish energy security in the most cost-effective method towards ensuring future sustainability for Malaysia.

Malaysia is a good location for solar energy application because it has a tropical rainforest climate. However, the usage of solar photovoltaic is still very small until now (Ahmad Wahab, 2012). Solar energy is one of the most promising renewable energy sources in the equatorial zone of Malaysia (Tan et al., 2019). A research by (Solangi et al., 2015) revealed that the majority of Malaysian are highly interested and attentive in solar energy in Malaysia and around 60% of the respondents are willing to choose solar energy if the cost related to solar energy usage is only as much as the current price of fossil fuel-generated electricity. Furthermore, government initiatives and incentives to support renewable energy make Malaysian are open to accept in using solar energy as it will benefit them. In addition, government play an important role as a prime mover towards successful solar energy policies in developing and developed countries. Hence, the Malaysian government should take on a crucial role in implementing solar energy policies.

PV technologies for the time being may continue to be the primary source of solar power generation. This is due to the potential of the sun as there is nothing can compare to its energy (Kabir et al., 2018). (Mekhilef et al., 2012) stated that Malaysia has a strong potential to develop and build large scale solar power because its location in the equatorial region. The abundance and non-stop supply of sunlight, no noise, cost effective in maintenance, self-sufficient of fuels source, the environmentally friendly factors, and most importantly, contribute towards lower emissions of carbon, made solar the right choice for future energy power supply.

#### Application of Solar Energy in Rural Areas of Malaysia

Our country location is within the equatorial region and with constant sunshine of up to eight hours a day and continuous exposure resulted in average radiation of 4,500KWh make it an excellent environment for the research and development photovoltaic technologies (Yusof & F, 2010).

Developing feasible solutions for future energy use could not only prevent Malaysia from becoming a net fuel importer in the next 30 years but also reduce our carbon emissions and improve quality of rural life."

Quoted from Dato' Sri S.K. Devamany S. Krishnasamy, Acting Deputy Minister of Energy, Green Technology and Water Malaysia (KeTTHA) at the Opening Ceremony of the Electric, Power and Renewable Energy (EPRE) Malaysia 2017 programmes revealed that renewable energy is important to improve the quality of live in rural areas. (Borhanazad, Mekhilef, Saidur, & Boroumandjazi, 2013) and (Anyi, Kirke, & Ali, 2010) agree that solar energy is among the most potential of renewable energy sources. The considerations are taken up in all of the aspect in term of rural area location and barriers of each of the energy for rural areas in Malaysia. (Lj. AleksiC, 2015) also mention in his study regarding rural tourism and how it is potential to be developed. Rural tourism buildings and other types of buildings in the remote and rural environment have great potential for application of photovoltaic systems.

It is crucial and important to provide electricity for remote communities. People in rural areas can ease their daily routine by using electrical appliances that have been long used by urban dwellers. Refrigeration also is one of the most important for rural area communities instead of cooking and lighting. (Anyi et al., 2010). (Borhanazad et al., 2013) mention in his study that the power of electricity can be related to each other as there is compelling connection between the energy and poverty. Energy can be considered the point or centre of poverty. Electrification in remote areas may affect the poverty in certain states as the whole of the country.

#### **3. ANALYSIS AND FINDINGS**

The author had chosen Kampung Rening, Pos Telanok, Cameron Highlands, Pahang as the proposed site. This village met all the requirement as it is one of the Orang Asli settlements, located in the highland, situated in the rural area, do not connected to the main electrical grid, and equipped with solar panel that have been installed there from year 2000. This indirectly answers all the research questions and research objective that have been highlighted.



Figure 1 View of the solar panel that have been installed at Kampung Rening, Pos Telanok, Cameron Highlands, Pahang.

Due to different lifestyle in Orang Asli home, the electrical appliances in the house may be limited. Thus, an interview with the head of the village (*Tok Batin*) during survey questionnaire exposes the electrical appliances that have in his house and preferences of electric appliances by the villagers in the table below.

Kampung Orang Asn Kening						
Item	Watt	Hour used per day	Total watt per hour [Wh]			
Fluorescent lamp	220	6	1320			
Rice cooker	650	0.3	195			
Radio	250	1.5	375			
Television	60	3	180			
Fan	50	3	150			
Phone charger	10	2	20			
TOTAL	•		2240			

 
 Table 1 Appliances that required by Orang Asli home based on survey questionnaires and observation at Kampung Orang Asli Rening

All the data will be simulated in Photovoltaic Geographical Information System (PVGIS). PVGIS is a web site application that gives you information about solar radiation and Photovoltaic (PV) system performance. Anybody can use PVGIS to calculate how much energy we can get from different kinds of PV systems at nearly any place in the world. The calculation in PVGIS based on the existing solar panel inputs. The existing solar panel installed at the village become a fixed variable for each of the simulation in the experiment. All these data will be simulated carefully based on the different total watt per hour as estimated in Orang Asli home as shown in Table 2. PVGIS also needed a fixed variable to run the simulation as illustrated in Table 2 below.

PV Installed [Wp]	80	Fixed variable
Battery capacity [Wh]	84	Fixed variable
Discharge cutoff limit [%]	40	Fixed variable
Consumption per day [Wh]	Varies	Manipulated variable
Slope angle [°]	30	Fixed variable
Azimuth angle [°]	0	Fixed variable

Table 3 Result of the electrical appliances simulated by PVGIS

	Total watt per	Percentage	Percentage	Average energy	Average
	hour [Wh]	days with full	days with empty	not captured	energy
		battery [%]	battery [%]	[Wh]	missing [Wh]
Fluorescent lamp	1320	12.21	100	25.99	1082.1
<b>Rice Cooker</b>	195	97.75	100	143.75	94.45
Radio	375	94.74	100	108.23	236.46
Television	180	97.92	100	146.95	82.81
Fan	150	98.14	100	153.61	59.67
Phone Charger	20	100	0	221.06	0

Table 4 Result with different number of solar panel installed simulated by PVGIS

Number of PV Installed	PV Installed (Wp)	Battery capacity (Wh)	Percentage days with full battery (%)
1	80	84	0
2	160	168	27.05
3	240	252	73.71
4	320	336	89.32
5	400	420	93.32
6	480	504	94.80
7	560	588	95.89
8	640	672	96.66
9	720	756	97.15
10	800	840	97.48
11	880	924	97.70
12	960	1008	97.81
13	1040	1092	97.97
14	1120	1176	98.03
15	1200	1260	98.14

Based on Table 3, PVGIS simulation reveals that fluorescent lamp is the highest energy demand by 1320Wh and resulted in 1082.1Wh of average energy missing throughout the whole year. Thus, fluorescent lamp are not capable to equip Orang Asli home as only 12.21% days with full battery able to charge in the battery compared to other electrical appliances. Rice cooker, radio, television, fan, and phone charger on the other hand are capable to equip Orang Asli home with one solar panel with each of the electrical appliances have 97.75%, 94.74%, 97.92%, 98.14%, and 100% percentage of days with full battery respectively. Overall, this experiment simulation totally based on individual demand on each of the electric appliances. Thus, different value of the solar panel needed to be tested to identify the optimum value to supply all the electric appliances combined.

As for daily usage, it is impossible for a person to use different electric appliances in different day. Combination of all the equipment will represent daily lifestyle. Thus, combinations of all the equipment were also tested to determine the capability of existing solar panel installed as shown in Table 4. The result shows that the PV installed cannot supply adequate electric with combination of all electrical appliances (2240Wh). The same solar panel are

tested by adding more solar panel one by one to identify the optimum sizing of the solar panel. Additional number of solar panels will resolve the electrical load problem facing by Orang Asli home. The photovoltaic panel are tested using four same panels at the site.

The result from the simulation shows that four same panel is the optimum number to equip Orang Asli home in the highland. Based on Table 4, 320Wp Photovoltaic panel installed and 336Wh battery capacity, it resulted in 89.32% of days with full battery which this is the optimum number of solar panels that need to be installed in the Orang Asli home. It is undeniable that more than four solar panel is capable to supply electric in Orang Asli home, however an optimum number of solar panels required to supply electricity to Orang Asli home. Thus, four solar panels is the optimum number for the correct sizing in order to equip Orang Asli home in the highland.

Figure 2 shows that the nominal power in Watt peak (Wp) is directly proportional with battery capacity in Watt hour (Wh) resulted in increase of nominal power with increasing of battery capacity.



Figure 2 Nominal power in Watt peak (Wp) with battery capacity in Watt hour (Wh)



Figure 3 Result with different number of solar panels installed simulated by PVGIS

Figure 3 reveal the result with different number of solar panels installed simulated by PVGIS with increasing percentage of days with full battery with the addition of solar panel. As the number of solar panels increased from five panel, the percentage stop rising significantly and increase gradually with 15 solar panel installed resulted in 98.14% of days with full battery.

Evaluation of the satisfaction of Orang Asli towards the solar energy supplied into their home based on the survey questionnaire. 22 respondents participated in the survey questionnaire to analyse the element need in the research. The data presented through figure below.

#### Satisfaction toward solar panel installed



Figure 4 Satisfaction level of Kampung Rening villagers towards solar panel installed.

Based on Figure 4, it shows that only 13.6% of the people in Kampung Orang Asli Rening satisfy with the solar panel installed, while most of the villagers are not satisfied with the solar panel installed by 86.4%. Moreover, with one solar panel that have been installed in each house currently, PVGIS identify that this insufficiency can be resolve by providing four solar panels to optimise electrical supply to one Orang Asli home.

In addition, the result on Orang Asli dissatisfaction may also be due to the solar panel that did not function properly as an interview with the head of the village revealed that; as per 13 houses with solar panel, only five houses within the village have a function solar panel. This dissatisfaction also may be due to the photovoltaic panel that did not maintain regularly causing power output reduction and short circuit in the system. All these issues resulted in majority of the villages are not satisfy with the solar panel installed.

#### 4. CONCLUSION

This research shows a strong relationship between the issues of sustainable energy which in this case solar energy and rural electrification. All the research elements have been critically arranged to answer the research objectives which are to analyse the capability of solar energy to supply electricity for Orang Asli home in highland and to evaluate the satisfaction of Orang Asli towards the solar energy supplied to their home in the highland. The product of this dissertation can be considered successful as the author managed to prove and answered the objective highlighted in the early discussion of the research. By using experiment simulation, it resulted by showing that current solar panel are not capable to ignite Orang Asli home in Kampung Orang Asli Rening, Pos Telanok, Cameron Highland PVGIS simulation reveal that with the current demand, the photovoltaic panel installed cannot supply electric as most of the time battery capacity remain 100% empty in the system. This situation can be solved by providing four solar panels which the optimum number of solar panels that will provide 89.32% of battery capacity in the system to supply electric in one Orang Asli home.

Through survey questionnaire, the respondents are not satisfied with the solar panel installed by 86.4% and only 13.6% satisfied with the solar panel. This dissatisfaction also may be due to the photovoltaic panel that did not function well in their home as it did not maintain regularly causing power output reduction and short circuit in the system. Moreover, the survey questionnaire, show that 72.7% of the respondents depend on solar panel to their daily works and 95.5% strongly agreed that their home need to be installed with solar panel. In short, the villagers of Kampung Orang Asli Rening are dependable on the solar panel contributing to high dissatisfaction level on solar panel installed.

The data gathered can be useful in many ways; neither to help the aborigine's community there by providing sufficient electric in their home nor even to help any designers that interested in designing Orang Asli home in the highland by using solar energy. It is recommended in the future research to analyse and detail out the cost-effectiveness or maybe profit and loss in realising this project as these data will be beneficial and useful. The application of hybrid system configuration in sustainable energy i.e., solar energy and hydropower can be extended in further research as hybrid system is more favourable in application of rural electrification.

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## DECOLONISING HERITAGE CONSERVATION NARRATIVES AND PRACTICES: PERSPECTIVES FROM THE SMALL ISLAND DEVELOPING STATE OF MAURITIUS

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**Abstract:** The role of cultural heritage in architecture and urban planning is well documented and evidenced. Heritage is additionally well evidenced as to its contribution in offering a sense of belonging for people and in 'painting' the identity of places, as well as fuelling important economic activities around the notion of 'heritage'. However, this progression is problematic in places void of traditional Indigenous populations, that are entrepôt's of eclectic peoples' land and sea transmigrations to places that hosted no Indigenous or First Nations peoples, that often rendering a perspective of cultural heritage limited to European colonial histories and legacies. This paper introduces the case of study of the Aapravasi Ghat, a UNESCO World Heritage inscribed property in Mauritius, and considers the consequences of strong cultural heritage conservation regulations supporting colonial history narratives whilst negating and respecting the property's rich and unique multi-culturality and legacy.

Keywords: Culture; Intangible Heritage; Mauritius; Small Island Developing States (SIDS); Colonial; Urban Development; UNESCO

#### **1.0 INTRODUCTION**

The role of cultural heritage is slowly getting more pronounced as an agent of change, planning and cultural identity. On the latter there is an emerging literature that advocates its use for supporting and respecting the identity of places, including the liveability of neighbourhoods and in supporting neighbourhood economic sustainability.

Richards (2018) highlights that attention upon cultural heritage is warranted given a number of factors that include technological advancements, change in tourism trends, consumption patterns and the realization of the economic potential that such heritage holds. Wang *et al.* (2018) argue that the advent of such technologies – like the virtual environment, cultural mapping and narrative platforms – are enabling in communicating the validity of cultural heritage as being beneficial to communities more known to a wider audience, and that this dissemination can aid cultural conservation efforts. Specifically, cultural heritage conservation is envisaged as paramount in humanity since, in enabling self and identity of place and human alike, especially given that our intangible cultural heritage is now exponentially being so threatened by emerging issues like politics, urbanisation, globalisation and intercultural merges and migrations, amongst many other trends.

Boswell (2011) explains that some cultural heritage, especially in urban areas are being disregarded; especially by our youthful digital-absorbed generation, and in its place is the inklings of intangible and fast-consumed digital cultural heritage like computer games and their tv-translations amongst others are being embraced and held up as the new 'bibles' of knowledge, cultural spirit and human value embodiment. Such is a generation unworried by the Anthropocene consequences of humanity. Whither cultural heritage values in this pace of physical and intellectual change. By historical construct, using similar platforms, UNESCO (2003) has long acknowledged that tangible cultural heritage can be conserved, that is possesses tangible human value legacies that can be 'preserved' and 'conserved', and that our 'made' cultural heritage can be elevated to improve the identity of places and thus given the attention they deserve. Such is the notions that arose from the built fabric devastations following Europe's post-World War I and World War II arguments that witnessed the birth of a Euro-centric ICOMOS, its particular heritage ethic, and its multiplicity of Charters that enshrined this ethic. Thankfully, it afforded an escape clause in its ethic to enable regionalist devolution and expressed, as expressed in the *Burra Charter* (1979+), the *ICOMOS New Zealand Charter: Te Pumanawa o ICOMOS o Aotearoa Hei Tiaki I Nga Taonga Whenua Heke Iho o Nehe* (1993+), as exemplars.

However, even this ethic is now being challenged by decolonisation theory, Indigenous philosophies, the 'tide of time' and human merging and resulting in increasing community and academic critiques colonial-informed values and regulations that are being interpreted differently as evidenced in the case of the city of Port Louis, Mauritius, discussed in this paper.

The international effort to make a positive case for cultural heritage (identification, conservation and or preservation) has led to some challenges, especially due to existence of two classes of culture; 'tangible' and 'intangible' heritage. Heathwood (2017) explains that the categorization of these has been a source of contestation as the tangible heritage category is seen to receive much more attention; hence, more funding, and the majority are in established places, especially in Europe, where they are highly valued and do not require further major attention. Witness the post-fire response to Notre Dame, as an exemplar of prioritization of tangible and intangible cultural fabric conservation action, that bear little comparability to the loss of properties due to the ravages of war 'incidents', novel ecosystem evolutions, climate change and or an absence of holistic quality curatorial management. On intangible heritage, Pietrbruno (2009) explains that due to their nature, most properties are seriously under-represented in cultural heritage inventories. Thus, little funding is obtained to conserve and promote them. Despite this, with the value legacy potential they hold, these too have the potential to contribute significantly to economic growth and human knowledge enrichment (Julia *et al.*, 2015; Petronela, 2016), and thereby improve human and wildlife liveability amongst other benefits (Vigneron, 2016; Masoud *et al.*, 2019).

The case of categorization (or making 'collections') is especially accentuated in the case of cultural heritage that reflects the colonized, inhabited places, where the long-held preference has been biased towards the conservation of colonial structures and colonization itself, but often hiding the reverse-story embodied in the memory of slavery, pain, suffering and inequality. 'Collection' making was a particular middle class European passion post-industrialisation. In this era, one sought to collect any aspect of nature from fossil to stone to wood to plant to animal to etc., leaving us with a current legacy of 'houses' of collections in the guise of museums, zoos, botanic gardens, etc., at the community level let alone at the individual owner/property level.

As Pwiti and Ndoro (1999) highlight, conserving such cultural heritage at the expense of heritage associated with the values of the actual 'Indigenous' locals has more often alienated them from their own identity and cultural values. From their viewpoints, such is perceived by them as an unfair representation of their 'history', and a catalyst to building an exclusive externally imposed societal narrative based upon colonization values and perspectives. They argue that the notion of considering some traditions, like religious practices, music, dances, art and artifacts and education systems, is archaic. Hence, it is not worth the title of 'heritage' elevating such heritage as a precursors for community tension and confusion of what qualifies to be regarded as 'heritage'. These arguments are evidenced in the research of Ucko (1994) who concludes that the Western outlook upon African Heritage in museums is static and irrelevant to Western ideas, and therefore mis-communicating African heritage narratives and connections to Western audiences. However, such museum-framed perceptions and presentations are not always shared by locals. The latter are, today, increasingly questioning and contesting their written foreign and colonial heritage, which has little to do with their understanding of their identity and culture, and they fail to understand why those alienating identities are more highly valued and given more attention than their own. For this reason, an examination of localbased cultural heritage philosophies and regulations for cultural heritage needs to be made clearer and carefully cross-culturally and cross-temporally unpacked. This is especially so given calls to decolonize cultural heritage regulations to better support localized diversified economies and the identities of their residents.

## 2.0 BACKGROUND OF PORT LOUIS, MAURITIUS

Port Louis is situated on the north-west coastal side of the island of Mauritius, surrounded by the Indian Ocean, is the capital of Mauritius. The island is bounded inland by the Port Louis-Moka (mountain) Range. Having an area of 46.7 km<sup>2</sup>, accommodating some 119,333 inhabitants as of December 2016, Port Louis is the most densely populated district of the island with 2,954 p/km<sup>2</sup> (Statistics, 2017). Port Louis remains one of the most vibrant cities of the island with a prominent historical and cultural dimensions infused within a multi-ethnic community (Ramkissoon and Nunkoo, 2011). From a historical perspective, when Mauritius was first colonised by the Dutch

between 1638 and 1710, the Dutch established a harbour at a southern village that they named 'Grand Port'. However, Port Louis was later chosen to serve as their administrative centre and capital city, because it hosted a naturally safe harbour in terms of its geography and terrain morphology (Nag, 2017). The Dutch named this place Noordt Wester Haven, and it was not until the French colonisation from 1735 that the city was re-named 'Port Louis' on the 'Isle de France' (1715–1810). The French governor, Bertrand François Mahé de Labourdonnais, is considered by many Euro-centric historians, as the one who led the initiative to develop Port Louis as a major trade port (Toussaint, 1966). Nonetheless, the capital city of Mauritius faced dire challenges even in olden times. For instance, in the 18<sup>th</sup> and 19<sup>th</sup> century, there was a series of fires, plagues and tropical storms, including bouts of malaria and cholera, that afflicted Port Louis (Macmillan, 2000). Nonetheless, the city showed great resilience, and is today viewed as one of the most important financial centres and Port Cities in Africa.

The urban planning legacy for Port Louis was established under French colonisation from 1715-1810, and then under the British until independence in 1968. The French approach was to favour large alleyways and to maintain a lush canopy. Their designed infrastructure satisfactorily sustained the Port Louis population of around 6,779 inhabitants in 1968. However, today, Port Louis accommodates a population of 155,226 (Stanford University, 2018), being a demographic increase of 2,290% over 50 years. The city witnessed this exponential increase in population without expanding its basic infrastructure services in many areas. Coupled with the effects of climate change, sandwiched by the Signaux Mountains, the Port-Louis Moka Range and the Indian Ocean, this rapid urbanisation has created major concerns in terms of city planning (PLDI, 2019).

The contemporary post-independence government's response to Port Louis' urban planning, has been haphazard. It includes poor consideration to the historical and ecological dimensions of the city. Moreover, the national urban planning frameworks favour car dependency and urban sprawl (Allam, 2018; Allam, 2017; Allam and Jones, 2018; Allam and Newman, 2018). This has led to a rapid erosion of the French-established green areas and several historical buildings in the city.

From a cultural perspective, Port Louis stands as one of the most culturally diverse cities in Mauritius (Throsby, 2001). Siew and Allam (2017) suggest two dimensions of culture that should be present in a broader definition: (i) culture being viewed as a set of attitudes, customs and beliefs shared by a particular group, and (ii) culture as a series of activities related to intellectual, moral and artistic uplifting of human life. These key dimensions support a prominence of an economic perspective in culture. For instance, it is recognised that culture englobes key industries like cultural tourism and creative industries that are both viewed as the driver and enabler of key pillars of sustainable development (UNESCO, 2012; 2016). Throsby (2001) highlights the need to consider cultural heritage as one key driver of the city's economics. Such consideration puts forth the rich cultural capital that Port Louis represents in terms of centuries old historical buildings, paved roads, museums, forts, and traditional and craft markets. In fact, the capital city has 81 sites that are listed as Mauritius' national heritage (MCCPL, 2016). Moreover, several culturally rich areas, including China Town, the Champ de Mars race course and the Aapravasi Ghat, are also found within the city's boundary; the latter being classified as a World Heritage property by UNESCO (UNESCO, 2018). The cultural vibrancy of the city also manifests in intangible forms and contributes to the vibrancy of the urban fabric of Port Louis. These include gastronomy, crafts and entertainment activities (Bertacchini and Re, 2017).

However, it has been noted by several authors that the maintenance and elevation of these key cultural facets of Port Louis would enable a major economic boost for Mauritius, and help in the upgrading of the social fabric of the city (Bertacchini and Re, 2017; Allam and Jones, 2019). This however poses problems as there are notable development hurdles due to extant restrictive heritage conservation regulations, namely in the UNESCO buffer zone as described in the next section.

### 3.0 THE AAPRAVASI GHAT

Located on the harbour front, the Aapravasi Ghat Immigration Depot (Figure 1) marks the site of arrival of over 500,000 indentured labourers, who arrived in Mauritius after the abolition of slavery in the United Kingdom, between 1834 and 1920. This mass migration was part of the British 'Great Experiment' and was replicated in other British colonies around the world (AGTF, 2013).



Figure 1. The Aapravasi Ghat Immigration Depot (Attractions, 2015)

The 'Great Experiment' denotes the first attempts by British plantation owners to implement a new form of labourer recruitment strategy that was introduced in Mauritius back in 1834, one year before the formal abolition of slave trade in the United Kingdom. The strategy involved indentured labourers; where a free person agrees, through the signing of a contract to work for a specified period of time in exchange for free pass to a colony. The Aapravasi Ghat Trust Fund (2009) explains that indentured labourers agreed to provide 'free' labour as a way of gaining 'freedom', though, the concept of slavery had seen its better days when the British Parliament in 1833 decided to abolish use of trades in all its colonies. With sugar plantations gaining popularity in Mauritius, there was an increasing demand for labourers, and the 'Great Experiment' strategy was deemed the most potent way to secure cheap labour. According to the European-authored Insight Guides (2016), indenture was seen as more humane, and that it was an experiment by the British to test whether free labour could help yield as much results in the sugar sector as was the case of slavery.

With the first 'batch' of 36 indentured labourers arriving from India to Mauritius, the experiment was deemed a success. Between 1834 and 1865, when the experiment reached its peak, more than half a million emigrants were sourced from India (over 95%), China, Madagascar and from the east African countries, amongst many others, with all arrivals first setting foot at Aapravasi Ghat (originally called Coolie Ghat). At this place they were formerly received, 'processed', and it was where their contractual engagement legally began (Allen, 2008). Though started in Mauritius, this form of labour recruitment was duplicated in all British sugar-production colonies, and was even adopted by other empires like the Portuguese, Dutch and the French (Northrup). The property of Aapravasi Ghat was inscribed on the UNESCO World Heritage List in 2006, only measures 1640 m<sup>2</sup>, while its buffer zone amounts to 289,000 m<sup>2</sup>. The Buffer Zone of the Aapravasi Ghat, commonly known as the Buffer Zone 2 (Lands, 2011), is illustrated in Figure 2.



Figure 2. Buffer Zone of the World Heritage Site (Lands, 2011)

Development in the Aapravasi Ghat Buffer zone is bound by strict regulations underlined in the Planning Policy Guidelines 6 (Lands, 2011), that was drafted and gazetted to conserve the unique architectural language and the cultural and historic nature of the place. However, the regulations tend to favour the preservation of its colonial architectural language, as discussed below, and there have been numerous complaints by landowners that the imposed regulations are not conducive to profitable business models due to strict height restrictions (Lands, 2011; AGTF, 2013). The latter restrict two storey building frontages only (Lands, 2011). While, traditionally, real estate by the waterfront has substantial value (K.W Chau, 2003), property encompassed within the Aapravasi Ghat Buffer Zone is deemed undesirable for development (Mega, 2014) due to regulations that negate development (Groëme-Harmon, 2016).

Within this policy context, buildings on the Port Louis waterfront are increasingly facing decay as building owners do not have an interest in renovating their assets because they are not be allowed to build higher than 2 floors. Even if their building was erected before the gazettal of the Buffer Zone regulations, their return on investment is considered to be too long in return years because site development cannot be maximised.

#### 3.1 Reinforcing Colonisation Through Heritage Regulations

Strong cultural heritage regulations have been a deterrent for development around the world. Bandarin and Oers (2012) note that heritage conservation has the potential to spur massive development, both socially and economically, but at the same time, it has the potential to stall development. Their words are true when considering the case of some countries that have maintained strict and strong heritage regulations, especially in regard to cultural heritage that conserves colonialism and its artefacts. A practical example is Zimbabwe where Makuvaza (2014) has narrated that the management of cultural heritage is still conservative and rigid, especially in adopting new modern management practices. Similarly, Chipangura (2017) notes that most Zimbabwean colonial architectural heritage is consciously being left to disappear over time, without anyone, especially those with the mandate for its conservation showing much concern. Chirikure (2013) showcases how strong regulations have been on the forefront in endangering valuable and priceless heritage cities with the pretence of development, while such heritage, when well utilized and conserved can help increase the development of the areas. For instance, he gives the example of Swaziland where a UNESCO nominated heritage city, Ngwenya Middle Stone Age ochre mine, was delisted to allow the government undertake iron mining (Chirikure et al., 2010). Such a move defeats logic, especially noting the long-term impacts of mining on the local society and the Swaziland economy at large. Thus substituting viable economic projects for lesser ones, as the listing of cultural heritage would have, in the long run, can reap more benefits than net benefits that would be accrued after the extraction of iron ore.

Additionally, UNESCO's own heritage regulations or management policy expectations scaffolded within any inscription, are also an accelerator for the increase in strong heritage regulations in some countries (Eze-Uzomaka, 2014). This is more biased towards what is perceived as favouring specific colonial heritage, which, to most communities, stands as symbols and reminders of difficult pasts. Recognising this argument, Steiner and Frey (2011) argue that UNESCO can be seen as diverting much attention and resources to colonial heritage to the neglect of emerging vernacular heritage that is synonymous to local communities. Hence, it prompts their conscious and unconscious deterioration and destruction. By supporting local cultural heritage, UNESCO could help ignite the economic and social benefits of heritage, and such could take precedence over less viable projects that are said to be threatening the site (Anderson, 2004; UNESCO, 2019; Farid, 2015).

The Planning Policy Guideline 6, the heritage conservation regulation as recommended by UNESCO, and enforced by the Government of Mauritius, serves as the local regulation to conserve the identity and character of the UNESCO Buffer Zone of the Aapravasi Ghat World Heritage Site. When analysing this document, one sees various architectural elements associative of the British and French colonial empires that are in conflict with the multicultural ethnicity and heritage of the place. Those are represented in Figure 3 to 5.



Figure 3. Acceptable Roof structure in support of solely colonial architecture



Figure 4. Acceptable walkways and balconies treatment



Figure 5. Layout encouraging backyards instead of courtyard design

#### 3.2 Urban Decay

Unfortunately, most cities, especially in developing countries are awash with colonial architectural works and edifices. If the UNESCO-informed heritage conservation regulations are faithfully implemented, such may lead to immense urban decay to the detriment of the real cultural heritage of the place. Such decay would result in either heritage-listed buildings to being abandoned and neglected. Thus, with time, they deteriorate as a result of the extreme weathers and time. Alternatively, such rich heritage is being destroyed, vandalized or demolished to give way for new architectural works that relate to a contemporary time period and the occupancy liveabilty requirements of the local community occupying that urban area. Lamandi (2015) acknowledges that UNESCO, above many other mandates, should map and keep inventories of all natural, cultural and community assets and their values and their vulnerability status. Thus, encourage holistic and integrated conservation strategies. Despite that outright mandate, the accusation of favouring colonialism means that these types of assets are at danger, and the potential they hold in helping revitalising cities cannot be realised. For example, in Lahore old city that includes major tracts of cultural heritage, Jayaram (2013) has argued that this heritage is facing a real threat from demands for additional, new and or modernised commercial and residential spaces. In Turkey, Marquart (2014) has explained that Istanbul's ambiguous heritage regulations have resulted in urban decay, including an area near the Zeyrek Mosque, a religious monument of Byzantine origins, that has decayed over years due to neglect.

The same trend can be witnessed in the Aapravasi Ghat Buffer Zone. In this Zone urban decay is being accentuated and enabled by strong heritage conservation laws that discourage investment and are misaligned with the identity of the place and its local context. This is resulting is abandoned and crumbling buildings, and where buildings are ultimately being substituted by parking lots that are often seen as most profitable ventures for allotments inside this Zone. This is represented in Figure 6 to 9.



Figure 6. Parking lots among ruins in the Aapravasi Ghat World Heritage Site. Photograph by authors.



Figure 7. Parking lots among ruins in the Aapravasi Ghat World Heritage Site. Photograph by authors.



Figure 8. Parking lots among ruins in the Aapravasi Ghat World Heritage Site.



Figure 9. Parking lots among ruins in the Aapravasi Ghat World Heritage Site.

### 4.0 ON HERITAGE CONSERVATION AND COLONIAL ENTANGLEMENT

Heritage conservation plays a key role in defining and conserving the identity of places. But, there is a need for heritage conservation to be flexible to accommodate the identity of different generations, thus, those who wish to escape persecution from those who feel left behind or those whose heritage, is in one way or the other threatened. Lewis *et al.* (2018) is of the opinion that such conservation efforts need to consider a wide range of aspects, especially the diversity of heritage in a particular place, and that such heritage needs to be recognized in its entirety. Otherwise, situations like eviction of poor locals, who also have a rich heritage to share with the world, may proliferate, as in the sorry exemplar of Casco Viejo in Panama where locals were evicted to pave way for wealthy foreigners after their dilapidated town was revitalized and gentrified (Hollmann, 2010). Such a problem arises from approaches adopted by responsible heritage bodies to address heritage and use tools to uplift neighbourhoods and communities.

Pwiti and Ndoro (1999) credit this problem to short sightedness in listing heritage that prompts the elevation of particular cultural attributes in unique points in time, and the disregard of other attributes and points in time that may have come before or after the designated temporal period. Such neglect has important consequences upon urban fabric, especially with people whose cultural heritage have been overlooked. This process can also emphasize when particular memories are given precedence over others, including relating personal narratives to events such as colonization or others that may be associated with painful memories or experiences that befell locals. To the authors, such heritage is perceived as deliberate schemes to constantly remind locals of the distress, pain and loss they, individually and or collectively incurred personally or generationally. In cases of colonial heritage, such heritage can trigger memories of slavery, genocide, and wanton exploitation of resources that the locals experienced personally or generationally thereby negating the attainment and equitable incorporation of social inclusivity in that cultural heritage. Thus, in Malaysia, the places of independence still today are not nationally heritage recognized but a wide collection of colonial commissioned architectural edifices are recognized (Nayan et al., 2019).

Unfortunately, despite the decry from locals, cultural heritage in most colonized countries is more often linked to colonial remains and those, in some instances, have deliberately been classified as being of contextual heritage. This is done even though colonial remains are not contextual, and fail to acknowledge that often entire cities and regions have often been erased of their local cultures and heritage without regard to their First Nation status, extent, magnitude or importance to the locals. Caust and Vecco (2017) explain that such practices are exacerbated by politics, greed, and economic drive, especially regarding attracting tourism that is consider valid if not ultimate economic policy driver of many countries. When the rich cultural heritage of a particular place is disregarded,

cultural heritage is not spared when processes like regeneration and gentrification are actualized. To locals, such processes are traumatizing as in most cases they eject people and fabric from their extant neighborhoods little able to articulate concern against the onslaught new cultures, the high cost of living, over-population pressures, and rules and regulations introduced to 'safeguard' the listed-alienated, heritage sites. Matero (2001) explains that such a population cannot, especially in a short term, acknowledge, confront or get acceptance of such traumatizing events as these serve additionally as living reminders of what their existing and previous generations went through.

Besides ejection and gentrification, the mere recognition of certain events as being of historical importance is enough to revive some forgotten rivalries. For example, in 2016, it was reported (Tekenaka, 2015) that Japan withheld its funding to UNESCO after the organisation decided to include documents that contained letters by pilots purportedly written to their families before they engaged in the 1937 battle that was considered by China as constituting a massacre of Chinese over people in Nanjing. China was reported to have submitted these documents to UNESCO with the aim of recognizing what happened to their citizens as a crime against humanity, but Japan contested this and argued that there was no such massacre. To the Chinese, they considered the tones and pride captured in those letters as a memorial of the racism and imperialism (thus colonization) that the Japanese had showcased upon their victims (Heathwood, 2017). In this example, the Japanese were accused of blackmailing the responsible organisation to force it to erase or re-write the narrative of such an important historical event. Borrowing from the assertion by Murray *et al.* (2011), listing such an event would have allowed the Nanjing locals to not only reflect on the loss that they experienced generationally, but such would also showcase their resilience, especially on how such fateful event helped shape their identity as a society.

The idea of disregarding local heritage can be argued to be insensitive to local communities, and counter inclusive to multicultural and diversified neighbourhoods. For many, their colonial heritage does not represent the rich cultural attributes of those colonisers but instead only represents a period of pain, loss and suffering. Heathwood (2017) attributes such neglects to the composition of the responsible body (UNESCO) especially noting that most of its membership is drawn from Western cultures. This is also pronounced in the work of Ndoro (1994) who argues that, in the case of Zimbabwe, where his case study is based, the reasons given for the negative attitudes and neglect to such historical heritage portray ignorance and indifference on the part of UNESCO. But, as is the call in this paper, the revisiting of regulations that govern the listing of cultural heritage designed area holds a key to culturally equitable uniformity, fairness and inclusivity.

#### 5.0 AN AGENDA FOR CONTEXTUAL HERITAGE OVER COLONIAL HERITAGE

The listing of historical architectural works and cultural heritage can be argued to have been unfairly biased. As evidenced in a survey of built heritage properties and concerns from varying geographical locations reveals, some specifically defined cultural heritage area and edifices are seen as receiving more attention than others (Pendlebury et al., 2017). In particular, that cultural heritage associated with colonialism is seen to have gained much more attention and perceived as being heritage to be listed as opposed to local cultural heritage. The latter of contrast is being given very little attention. This bias thereupon gives rise to limited conservation efforts for non-listed yet locally rich cultural attributes and heritage values. Interestingly, UNESCO, the international organ mandated with identifying and listing of such heritage recognized this imbalance. In 1994, it performed a self-reflection mission to address this issue that was already been identified especially from unfairly represented nations, and in their report from the 'soul-searching mission', they promised to try as much as possible to provide fairness, but however, did not promise an equal balancing (ICOMOS, 2005). The classification of colonial architecture as heritage had been amongst the noted issues raising most concern. This was observed as representing a direct recognition of colonial history, a distinct period in time, and it was being equated as being classified as part of 'positive heritage'. Reinforcing this argument, Rico (2008) argues that UNESCO has no classification for 'negative heritage', a cultural type that remains as a constant reminder of the pain, suffering and loss amongst other wrong happenings that engulfed a given society or group of people. From our perspective, every form of cultural heritage is considered as 'positive heritage' by UNESCO, and noting that amongst those properties listed, there are notable colonial architectural works that historically can be interpreted as an endorsement of colonialism that a substantial number of countries went through and are going through today in various forms and guises.

Noting that events of colonialism are imprinted in history, and cannot be forgotten, such must not be separated from the pain, suffering, loss, poverty, dehumanization and other evils that such 'incidents', events and periods of history brought about. Such, therefore, should not overshadow 'positive cultural heritage' that preceded and also

succeeded such fateful periods, then and now today. As Hillier (2013) posits, it is equality, if not more important to accord cultural heritage attributes of local cultures and provide those due attention and support, as this will provide a sense of fairness to marginalized communities. On this, Byrne (1991) is convinced that there must be a paradigm shift, especially in the perception of cultural heritage. Going further, he argues that such listings should be divorced from Western perceptions that have been discriminatory and selective, and never compatible with Eastern, Indigenous or other perceptions of what constitute 'cultural heritage'. Thus, he calls for a re-evaluation of what constitutes 'heritage'.

The strong heritage conservation regulations discussed in this paper, however, can often be interpreted as being tools to freeze development in cities. Additionally, they are normally linked to a distinct period in time, and they accordingly favour the styles adopted during that time period (Chitty, 2017). When this happens, the new development approaches that may be relevant to the demands and challenges of now may be stifled. Such restructures deny a city from reaping the advantages that are warranted from the presence of its diverse cultural heritage. In particular, a city would not be able to benefit from conservation funds that are released to conserve or promote a particular heritage listing to the detriment of a holistic history of that place (Chandan and Kumar, 2019; Kigadye, 2014). Similarly, noting that most listed heritage translates to increased tourism activities, a city that is limited to only given architectural styles representing a given time period may fail to benefit fully from this potential economic frontier (Siew and Allam, 2017). Therefore, a proposed redefinition of cultural heritage must take into account such important aspects of urban development. Thus, there is a need to emphasize the representation of culture in its entirety, including factoring in different points of time. Chohan and Ki (2005) are of the view that urban development and regeneration programs should be woven into a complex balancing process that promotes development programs while at the same time allows for the maximization of the conservation of diverse elements and dimensions related to that places' cultural heritage'. We argue that any redefinition of cultural heritage must incorporate the concept of sustainability that could then guide in ensuring that a sound balance exists between heritage conservation and urban development; an argument embodied in the rationale for the adoption of the Historic Urban Landscape theory and designations. These arguments are also shared by Appendino (2017) who posits that sustainability drivers should be at the centre of heritage conservation debates, since they would help define how developments would be conducted without compromising the heritage of any particular time period.

Yin *et al.* (2019) explain that the challenge remains in re-formulating heritage conservation regulations proposed by local governments or by UNESCO with the aim of ensuring that a local population's diverse cultural heritage across time is represented in local and world heritage listings so that all can benefit from such listing socially and economically. However, there are a plethora of challenges that may arise with such shift in thought. These include the role of local governments, through their planners, disregarding certain heritages, especially those that invoke negative memories or are seen to glorify certain events like colonialism. As explained by Chipangura (2017), and also by Pendlebury et al. (2017), there is a policy need to affirm the identity of the place and the locals, to showcase the resilience of the locals, as well as to bring them some economic fortune through activities like tourism. A sound balance of both positive and negative heritage thus needs to be navigated without significant compromises.

#### 6.0 CONCLUSION

The role of heritage is seen to play a key role in contributing to the liveability of urban areas. However there seems to be an emergence of two forms of heritage; 'positive heritage', being that celebrates local people and communities, and 'negative heritage', being that associated with events highlighting pain and suffering. For many, colonialism is equated to evoke the latter and the support of only 'negative heritage' can lead to negating the unique, vibrant, and rich cultural attributes of certain areas. While this practice may seem as obvious, those malpractices in heritage conservation can be seen to be enacted in various regulations, including those of the UNESCO for World Heritage Sites. Such is evidenced in the case of Aapravasi Ghat in Mauritius. The authors argue that in order to support the development of inclusive neighbourhoods, heritage conservation regulations need to be revised to enable both development respectful of local cultures and equalise both 'positive' and 'negative' cultural heritage attributes, instead of focussing and freezing the identity of areas to solely one historical point in time.

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# COUNTRY, MEMORY, AND REMEMBRANCE. RECONCILIATION THROUGH INTERCULTURAL DESIGN IN LANDSCAPE ARCHITECTURE: A CASE STUDY FROM FAR NORTH QUEENSLAND

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Abstract: All development in Australia occurs on Indigenous lands. There is a need to improve ways of working in the built environment to better recognise and respond to the cultural landscapes and values of first Australian peoples. Supporting processes of reconciliation meaningfully in Australian public landscape architecture projects relies upon having policies and systems of governance that embed Indigenous values and leadership. It also relies upon the competence of designers in the practice of intercultural design. Two histories, ancient and colonisation, informed the *White Rock Cultural Domain* case study project which was developed in consultation with Gimuy Walubarra Yidinji elders in Cairns, Far North Queensland. Intercultural design methods enabled the creation of a culturally responsive community precinct masterplan that centres Indigenous history, connection to Country, and remembrance of the Frontier Wars as an authentic alternative to an existing local government project brief for a sporting and neighbourhood precinct.

Keywords: Intercultural design, Frontier Wars, memorials, Gimuy Walubara Yidinji, reconciliation.

#### **1.0 INTRODUCTION**

'When we have power over our destiny our children will flourish. They will walk in two worlds and their culture will be a gift to their country' (National Constitution Convention 2017).

This extract from the 'Uluru Statement from the Heart' (2017) affirms the hopes and visions of Australia's first people for structural change and recognition as part of the nation's journey towards reconciliation. In 2009 Australia announced its support of, and signed the United Nations Declaration on the Rights of Indigenous Peoples. Part of the declaration recognises the value of Indigenous peoples' knowledge of the land, stating that:

'respect for indigenous knowledge, cultures and traditional practices contributes to sustainable and equitable development and proper management of the environment' (United-Nations 2007, p. 4).

An increasing number of Australian organisations and government agencies are considering how they might better respond to Indigenous heritage and culture in built environment development. More are implementing Reconciliation Action Plans (Reconciliation Australia 2017) and there is growing recognition of Indigenous values reflected in policy. An example of this is the recognition of Indigenous cultural heritage in *The Far North Queensland Regional Plan 2009-2031* (Queensland Government 2009, pp. 66-71). There remains however a frequent disconnection between intent and actually achieving built environment outcomes that respond meaningfully to Indigenous values. This disconnection has been described in the context of planning (Low Choy et al. 2011, p. 1., Moran 2004, p. 339, Porter 2013, pp. 283-285), and at length in the context of Aboriginal housing (Fien et al. 2007, pp. 4-6., Davidson, Go-Sam, and Memmott 2010, pp. 1-8., Moran et al. 2016, pp. 2-6.).

The case for developing better ways of working between cultures in the built environment include arguments founded on principles of ethics, equity, inclusiveness, identity, authenticity and '*cultural sustainability*' (Memmott and Keys 2015, pp. 1-2). Additionally, deep reflection on the Indigenous history of a place can help to identify authentic, place-based narratives which, with Indigenous permission and collaboration, may imbue genuine identity to new public spaces and provide greater relevance to all people. By progressing beyond entrenched Western design heuristics and digging deeper into 'an experience supported reservoir of understanding' we can create spaces that leave us feeling enlightened (Krog 1983, p. 76).

This paper features a case study that seeks to demonstrate how landscape architects and government entities might engage more meaningfully with traditional land owners on public landscape projects in Australia. The *White Rock Cultural Domain* project was undertaken for the Deakin University unit SRD768 Landscape Design Masterclass (Allwood 2018). This paper is a condensed form of the subsequent SRR711 unit thesis (Allwood 2019). Intercultural design methods led to the creation of a culturally responsive masterplan for a community precinct on a site in Cairns, far north Queensland. The same site had been identified for development as a sporting and neighbourhood precinct by the local government authority. The case study project responds instead to Country and local history and incorporates a Frontier Wars memorial: an emerging form of memorial in Australia. Consultation was undertaken with directors of Indigenous ecology firm Abriculture, Mr Gudju Gudju Fourmile and Ms Jenny Lynch, during the design of the *White Rock Cultural Domain* (2018a, 2018b, c), and for the thesis.

Mr Fourmile is an elder of the Gimuy Walubara Yidinji people, the traditional owners and custodians of the area from the Barron River to Mackey Creek near Gordonvale. Their clan name describes their Country: Gimuy is the Yidin name for Cairns and also for the slippery blue fig (Ficus albipilia) found in the Cairns area. Aboriginal people have continuously occupied the land on which Cairns is built for millennia. However recognition of their rich culture and deep relationship with this place has only recently begun to be incorporated in public landscape projects in Cairns, albeit modestly, and typically represented by interpretive devices or art that is grouped in collections with Indigenous art from other places.



Figure 1 Map showing the extent of the Gimuy Walubarra Yidinji native title claim area in green (adapted from the National Native Title Tribunal, 2018). Inset map of Australia adapted from vecteezy.

Before entering into discourse about intercultural design practice, it is proper for me to state who I am. This protocol aligns with Indigenous 'Ways of Knowing' as part of an Indigenous epistemology based on 'relatedness': *'Who are your people, and where are you from'*? (Martin 2008, p. 76). I am a practicing architect and a landscape architect. I am of European and Chinese descent and the fourth generation of my family to live in Cairns. I have been fortunate to work on projects with Indigenous people in many communities since 2005. I am thankful to the Indigenous people with whom I have worked for granting these opportunities. I have worked with Mr Fourmile on projects for Indigenous people in Cairns since 2012.

#### 2.0 INTERCULTURAL DESIGN

The adjective intercultural is defined as: 'taking place between cultures, or derived from different cultures' (Oxford Dictionary 2018). The term intercultural design first appears in the context of architecture used by Canadian scholars Martin and Casault (2005), who described the challenges of designing for people of a culture other than one's own. The term intercultural design in relation to method in architecture practice is separate to participatory, inclusive and universal design and is distinguished by the acknowledgement of philosophical differences.

'intercultural design is a process that brings consciousness of cultural perception, beliefs and bias to the fore, rather than containing the design focus to user participation and physiological needs' (Fantin and Fourmile 2018, p. 438).

According to Memmott and Davidson, this field emerged from, and integrates behaviour/environment theory (2007, p. 53). While international discourse in the field of intercultural design encompasses many topics, conditions and insights, there are four key themes that emerge. These are condensed as follows:

- 1. Governance: Ensure the project procurement and delivery framework and metrics encompass and value Indigenous knowledge and ways of working; uphold a balance of power, interests and representation; and commit to delivering Indigenous priorities.
- 2. Leadership: Ensure there is Indigenous leadership and oversight on the project. Ensure you are working with the right people with the authority to speak for a particular place.
- 3. Relationships: Seek permission to engage with Indigenous people on a project. Establish agreed protocols for communication, permissions and use of material; agree on methods that will ensure reciprocity of learning, including deep listening, and mutual exchange; acknowledge diversity; manage expectations.
- 4. Place: Recognise the context of the cultural landscape that is particular to a place and its people, and understand the connections from it to the surrounding landscape..

Much has been written about differences in philosophy between Indigenous and non-Indigenous peoples in Australia. Noonuccal Quandamookah scholar, Karen Martin, describes '*Ways of Knowing, Being and Doing*' that are central to Indigenous epistemology (2008, p. 72-80). Fantin and Fourmile (2018, p. 439, p. 450) observed that Indigenous values and ways of working often do not align with Western processes and metrics. Fourmile (2018, p. 438) describes architecture projects as being defined by 'institutional learning', a reflection of the dominant Western foundation of knowledge that governs development. A lack of awareness of Indigenous world views and cultural protocols can lead to a perception that undertaking project work in Indigenous environments is complex to navigate. Sarah Lynn Rees (2018, p. 180), a Palawa architecture graduate, descended from the Plangermaireener people of Tasmania, observed that amongst non-Indigenous professionals, not knowing where to start or how to communicate, along with fear of causing offence can create reluctance to engage on projects with Indigenous people. She states:

'In my opinion all architects and built environment practitioners should be capable of engaging in Indigenous projects in a sophisticated and meaningful way because everything that is constructed or deconstructed in Australia is on Aboriginal land' (Rees 2018, p. 181).

Intercultural design theory shifts focus away from the object of production towards the method, and relies on the concept of agency: designers are agents in an intercultural design process. Indigenous academic, Carroll Go-Sam, and Cathy Keys describe how cultural agency has been exercised in various architectural projects through collaboration, advocacy and co-governance (2018, p. 361). Revell et al describe the need for professionals working in bi-cultural contexts to develop cultural competency within a larger framework encompassing 'a decolonised understanding of Indigenous ways of knowing' (2018, p. 473). This infers that frameworks founded on the values and metrics of a single culture (Western, colonised), are fundamentally unsuitable for working on bicultural projects. Dalla Costa illustrates this by highlighting the inherent difficulty of accessing 'intangible, abstract, cultural

undercurrents' in the context of mainstream project structures in Canada and USA. She states there is often only opportunity for some desktop research on history and culture of a people, coupled with two or three community engagement sessions (2018, pp. 195-196). This is also the case on public projects for Indigenous people in Australia because they are often primarily reliant on government funding, and are subject to mono-cultural political and policy agendas with their inflexible procedural, economic and program conditions.

Apalech Wik scholar Tyson Yunkaporta, recommends focussing on Aboriginal pedagogies and processes, rather than content in the context of Aboriginal knowledge. He states importantly that: 'working with Aboriginal pedagogies embeds Aboriginal perspectives even when specific cultural knowledge is absent' (2009, p. 148). This concept is important to intercultural design methodology because, even though specific Indigenous knowledge is often not shared by custodians for various reasons, a framework that preferences Indigenous ways of knowing and working will still enable culturally responsive project outcomes.

Increasing competency in intercultural design can be achieved through education and practice, but in a colonised nation such as Australia, a deep understanding of the history, processes and ongoing effects of colonisation is essential to be able to work with empathy, build relationships and to understand the place of reconciliation in the built environment.

### 3.0 COUNTRY, COLONISATION AND DECOLONISATION

This section considers Indigenous people's relationship to land prior to colonisation in 1788, then acknowledges stories from early colonisation which *'leave parts of our nation holding the burden of trauma while other live with an historical blind spot'* (Reconciliation Australia 2016). The colonisation of Australia commenced with a British claim of terra nullius<sup>1</sup>, followed by settlement practices of dispossession characterised by violence and other means of control. The subject of colonisation in Australia is extensive and complex. This section focuses on the themes of colonisation applicable to the Cairns area, including the Frontier Wars<sup>2</sup>, and considers how we must overcome the extant ontological blindness born of colonisation in order to progress reconciliation through processes of decolonisation.

#### 3.1 Country

All land we live and work upon in Australia is Indigenous land, entwined with ancient histories and crossed with the song lines, creation stories and law of the longest surviving continuous Indigenous cultures in the world. Indigenous peoples, representing more than two hundred and fifty language groups (AIATSIS 2018), managed Country in Australia. Hunting grounds, settlements and areas of agriculture and aquaculture were defined by visible mosaics of clearings and other manufactured features as described by Gammage (2011, p163). Gimuy people in far north Queensland created clearings for hunting, living and ceremony before European settlement and some of these remain visible in the Cairns urban landscape. Aboriginal people lived in settlements prior to 1788 and had an established ethno-architecture, comprising a varied repertoire of temporary and permanent dwelling types that responded to local custom, conditions and materials, as described by Memmott (2007).

Deborah Bird Rose reminds us that 'Country in Aboriginal English is not only a common noun but also a proper noun. People talk about Country in the same way that they would talk about a person' (1996, p7). Thus, to omit Country from design processes on the land is akin to leaving family behind. Indigenous Australian ontologies encompass ways of being and knowing that emerge from intertwining relationships between Country, Law and Dreaming; whereas Western epistemologies reflect a position in which people own, divide and control land. Rees states "Aboriginal people don't 'own' land, they are 'owned by it'" (2018. p181).

<sup>&</sup>lt;sup>1</sup> Terra Nullius: a Latin term meaning land that belongs to nobody, used to justify the dispossession Indigenous peoples. Initially assumed in Australia, but first formally applied in legal contexts in 1819 ((Banner 2005) p112)

<sup>&</sup>lt;sup>2</sup> Frontier Wars: describes the violence that occurred between Indigenous people and colonial settlers as the latter displaced the former from their lands, and was typified by the indiscriminate and premeditated massacre of Indigenous people.
'Since country cannot be divided, while the land may be damaged or traumatised by colonial processes, like a broken arm, it can heal through Country, Thus if one part is removed physically, the songs and stories keep it in place, in memory, and its knowledges remain intact'. (Burarrwanga et al. in Hromek 2018. p222)

Thus it could be said, even though the European settlement history of dispossession has altered Indigenous people and spaces, the overarching concept of Country for Indigenous Australians remains unaffected. The ethical responsibility to identify and safeguard cultural spaces is recognised internationally by 'The UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage' (UNESCO 2003. Article 2). Cultural spaces are defined as spaces of intangible cultural heritage because they are associated with practices and knowledge that are founded in tradition, and link continuously to contemporary culture. The Convention further recognised that intangible cultural heritage is important because of its role in bringing people together and facilitating understanding between them. Recognition of the effects of colonisation upon the cultural heritage of Australia's Indigenous peoples is fundamental to the process of reconciliation.

## 3.2 Colonisation

North Queensland was the last part of eastern Australia to be colonised. In the late nineteenth century, Yidinji clans<sup>3</sup> in Far North Queensland suffered the dispersal practices that swept northward on the frontier of colonisation (Bottoms 2013, p6). Massacres occurred at places that often bear names reflecting this history. Skeleton Creek is one such place. It forms the southern boundary to the Cairns suburb of White Rock. The Yidin name for this place is Bana Jabugarra and the massacre that occurred here in 1885 was captured in the following historic journal entry:

Michael O'Leary, writing as "Coyyan", many years later recalled a 'most imposing sight was when we struck Skeleton Creek, for nearly every stump or tree had a nigger's [sic] skull as a trophy of the days when 'dispersing' was the law'". (O'Leary in Bottoms 2013, p148)

The State commissioned the Queensland Native Mounted Police to protect settler interests by carrying out 'dispersals' of Aboriginals (Ibid. p95). Mr Fourmile recounted a story passed down from these times: 'the police climbed up Bunda Bunimi (Picnic Hill) at White Rock and used it as a vantage point to shoot down at Gimuy people' (2018a). The area south of Cairns, including White Rock, became a settled farming area, with sugar cane the dominant crop. Mr Fourmile described the period as one where Gimuy people became servants of white settlers and would often take their master's surnames: 'There are the white Cannons and there are the black Cannons; and the white Hydes and the black Hydes' (2018a).

A period of 'protectionism' followed, when Aboriginal people were forcibly removed from their ancestral lands and taken to reserves run by the state, or missions that were run by Christian church organisations. Aboriginals became wards of the state, which controlled Aboriginal wages, movement and marriage (Queensland Government 1998. p11). Mr. Fourmile, aged in his fifties at the time of writing, recalled living on the Aboriginal reserve at Yarrabah as a young man, and needing a permit to be able to visit Cairns. He observed that his '*people were not free to travel around on their own land*' (2018a).

Despite experiencing great loss and discrimination since colonisation, Yidinji people have maintained continuous cultural knowledge relating to places on Country. Their knowledge, founded through millennia of continuous occupation, includes ancestral histories that record the rise of sea levels and local volcanic activity. Their Stories record some of the oldest extant human memories that are corroborated by Western, scientific observations (Nunn and J. Reid 2015. p22-25, p42., Nunn 2017).

## 3.3 Decolonisation

<sup>&</sup>lt;sup>3</sup> The Yidinji Tribal Nation extends from Cairns south to Deeral, and inland to Lake Barrine. (Tindale 1938) The Yidinji Nation is made up of several clan groups. Gimuy Walubarra Yidinji are the northernmost clan, located in the Cairns to Wright's Creek area.

Decolonising practice, and policies and systems of governance in Australia starts with examining how the effects of colonisation have influenced their structures and processes in a way that creates disadvantage for Indigenous people. 'Decolonising theory and practices seek to reverse these modes of being and practice to ensure all Australians uphold the rights of and understand the values of Indigenous Australian peoples' (Jones et al. 2018. p24).

Rees illustrates this by drawing attention to the Australian Government's 'Closing the Gap' initiative that was established in 2007 to improve Indigenous health, life expectancy, education and employment. She observes this initiative is about addressing Indigenous disadvantage in a 'Western system, by Western standards'. She reverses this concept and applies it to the architecture profession to ask 'how do we close the non-Indigenous gap?' (Rees 2018. p176). She suggests there is a need to increase education and cultural competency for practitioners in this space to effectively decolonise the way architecture is practiced.

## 4.0 MEMORY AND REMEMBRANCE

## 4.1 Remembering the Frontier Wars

There is a growing movement towards recognising Australia's Frontier Wars history and creating remembrance for the loss from the widespread genocide that occurred. The topic remains politically sensitive and official recognition of this history is still missing. Governments of all levels maintain a reluctance to engage dialogue about or developing memorials to the Frontier Wars. Director of the Australian War Memorial, Brendon Nelson, advocated that the Frontier Wars story belongs in museums (Evans 2018). This view ignores people's desire for memorials, remembrance and healing, instead implying that the Frontier Wars is a closed chapter of history that belongs in the curated collections of museums. It is a rejection of the need to recognise historical trauma in Indigenous Australia.

According to scholar Andreas Huyssen, 'memories of past violence or historical trauma can only function if they operate in different media and different sites in a society. One single thing will never do it. That would be precisely the wrong model' (Huyssen in Neath and Andrew 2018). This view reflects how loss from other wars is remembered with Anzac memorials. These feature in regional towns across the nation, providing a way for people to remember loss locally.

## 4.2 Memorial Typology

The memorial as a landscape architecture typology has developed since the 'closed narrative' monuments predating World War Two. That memorial typology effectively does the work of remembering for us: '*Such memorials may only displace memory*' (Young 1999. p4). Counter memorials in contrast are often participatory or transitory. They employ 'open narrative' devices such as metaphor to evoke, allowing memory to form through interpretation. These forms of memorials provoke a deeper contemplation and understanding in the observer. Some examples of this type of memorial are: Eisenman's Memorial to the Murdered Jews of Europe (Berlin 2005) and Maya Lin's provocative Vietnam Veteran's Memorial. Lin states her design allows for 'personal reflection and private reckoning' (Lin in DeTurk 2017). Dahlberg's Memory Wound monument at Sørbråten, Norway, is a memorial to a terrorist attack. A deep cut through a headland interrupts the topography and is an evocative metaphor for loss (DeTurk 2017).

The use of trees as a memory device is characterised in memorial groves, peace parks and memorial avenues. Trees are employed to evoke memory in precise, poetic effect in Nelson Byrd Woltz's Flight 93 Memorial, where groves of red maples drop their leaves en-masse in September to align with the anniversary of the plane crash in 2001. A field of wildflowers marks the location where the plane came to rest (Woltz 2005). The use of open narrative memorialization and the use of symbolic planting are central to the *White Rock Cultural Domain* case study. This approach is particularly suited to intercultural design settings where protocols may limit the sharing of knowledge and the inclusion of specific cultural references.

## 5.0 CASE STUDY: WHITE ROCK CULTURAL DOMAIN

## 5.1 Background

This case study describes a student project<sup>4</sup> that was undertaken in parallel with a real master planning project<sup>5</sup> on the same site for the Cairns Regional Council (CRC) by the author's architecture practice<sup>6</sup>. The student project was conceived as an alternative to the CRC design brief for a sporting and neighbourhood precinct on a four hectare site adjacent to a state primary school in White Rock, south of Cairns. White Rock has an Indigenous population of 16.9% (Australian Bureau of Statistics 2016). The design brief provided by CRC came from the recommendations of *'The White Rock Recreation Study'* (Otium-Planning-Group 2017, Cairns-Regional-Council 2018), commissioned by the CRC Sport and Community Services Committee. The report recommended the following elements for the project site: a 'Multi-user rectangular sports field, Community/neighbourhood centre with amenities servicing the sports field, bikeways and pathway linkages, play space in the southern section, exercise and fitness elements, and capacity to support community events' (Cairns-Regional-Council 2018).

## 5.2 Intercultural Design Consultation

In the first consultation for the 'White Rock Cultural Domain' project, Mr. Fourmile reminded the author, 'there are two histories here. Ancient history and contemporary history: you know, after European settlement' (2018a). This was a reminder to consider both histories in the project, and to remember that Gimuy cultural knowledge, ancient and inextricably linked to Country, is not forgotten. Protocols were discussed and established around consent, attribution, naming, review processes, and sharing the work once complete. Permission around cultural content was checked regularly, and content was not release without cultural review and approval. During this time, Gimuy elder Uncle Peter Hyde became a regular visitor to our office, and used available studio space to create artwork.

The location of the 1885 Frontier Wars massacre, Bana Jabugarra (Skeleton Creek), is near the project site. The author also had some prior knowledge of nearby landscape features of cultural significance, and was aware that there were many Yidin Stories that overlaid that area, but did not know the details of these Stories. It was fragmented information, but was enough to recognise the project site was probably located in an area of Indigenous cultural significance. A generous, unrelated invitation for members of our practice to walk on Country at Girrawanday and Garaba<sup>7</sup> with Uncle Peter followed. The author does not have permission to identify the sites visited, and the details provided by Uncle Peter about their use were purposefully limited<sup>8.</sup> Together however, they painted a picture of occupation, land use, and ancient cultural knowledge and practices that occurred in that area. Even though the site is now cleared and featureless, an area of marshy ground covered with sedges<sup>9</sup> persisted through to the dry season, indicating a water source. It was confirmed by Uncle Peter and corroborated by Mr Fourmile that the project site contained an ancient freshwater spring of cultural significance, which had been erased during development in the 1960-70's. The site was known to Gimuy people as one of fresh water and of healing.

Additional themes relating to environment and Indigenous ecology emerged on a desktop review of mapping and planning overlays, and during meetings with Mr Fourmile and Ms Lynch. The site is in close proximity to the estuarine waters and mangroves of Trinity Inlet, which is part of the Great Barrier Reef Marine Park. The area has isolated remnants of coastal rainforest and melaleuca wetland adjoining the mangroves. Prior to settlement this area had abundant traditional food sources. Uncle Peter recalled Gimuy people caught freshwater fish, turtles and eels in the creeks, and shellfish and baby crocodiles in the mangroves. They hunted wallabies in the open-forested grasslands and looked for native honey in the melaleuca wetlands. The rainforest areas also provided seasonal fruit

<sup>&</sup>lt;sup>4</sup> The project was created for the final year Master Class Studio, Master of Landscape Architecture, Deakin University, 2018. <sup>5</sup> The CRC master planning project was not publicly released at the time of writing, so it was not possible to include images

of it or discuss any details other than what is available publicly.

<sup>&</sup>lt;sup>6</sup> The author is a partner of the Cairns based practice POD (People Oriented Design).

<sup>&</sup>lt;sup>7</sup> Girrawanday and Garaba are the traditional names for the area that makes up the suburb of White Rock.

<sup>&</sup>lt;sup>8</sup> Gimuy people protect their cultural knowledge carefully. The reasons for this are many and include: cultural protocol, mistrust of non-Indigenous researchers, stemming from the early work of anthropologists; and competing native title claims over parts of Cairns at the time of writing. The author understands and respects these reasons.

<sup>&</sup>lt;sup>9</sup> Sedges are a grass like plant that are associated with wet ground.

and yams. Colonial settlement bought farming then residential development to this area and disrupted the natural ecology. Water courses were erased and replaced with housing developments and a system of large concrete storm water channels.

It became apparent that there were far more compelling narratives for a public landscape project on this site than the council brief had called for. These findings were shared with council, who agreed to the inclusion of some water sensitive urban design strategies, a rainforest food trail and a yarning circle, but the original brief for a sporting precinct didn't alter, and POD's request for Indigenous engagement and consultation for the design of the council's project remained unfulfilled.

As the student project progressed, Allwood met with Mr Fourmile and Ms Lynch on three occasions over a period of two months to yarn about local history, culture, protocol, ecology and to reflect on the evolving design. These meetings provided the opportunity for learning both-ways. Mr Fourmile shared stories of contemporary history from an Indigenous perspective, shared Gimuy place names, and referred to some aspects of traditional culture, knowledge and Country. Ms Lynch, a qualified ecologist, shared knowledge about ecology, land management and her interest in cultural-themed play spaces. The author shared examples of memorials and projects incorporating indigenous design and discussed their relationship with theory.



Figure 2 Sketch by Gudju Gudju Fourmile and Jenny Lynch of Abriculture of concept for planting for remembrance in the 'White Rock Cultural Domain' project (Fourmile and Lynch 2018b).

The design evolved to include the restored spring; a rainforest food and resource trail; a yarning circle; a culture play area; a Frontier Wars remembrance path; and a gallery space that references the conjoined dome traditional rainforest dwellings of the region. An adjacent sunken court nestles into the flank of a raised hill. The hill was developed to provide a focal element in the landscape with enhanced views to Country, and makes use of the excavated material from the restored spring on site. It features a central lookout with radiating groves of seasonally flowering trees in the colours of traditional ochres: white, red and yellow for remembrance. The memorial groves are interspersed with clear view corridors, connecting visually to significant places on Country: Bunda Mundi Ghunji (White Rock Peak), Bunda Djarragun (Walsh's Pyramid), Bunda Bunimi (Picnic Hill) and Bana Jabugarra (Skeleton Creek). A community centre was also included on the student project, but its use would reflect community preferences other than sport.



Figure 3. White Rock Cultural Domain Master Plan (Allwood 2018).

On the final design consultation meeting, Mr Fourmile commented on the importance of this project from his perspective. He stated that he would like to see it developed further in consultation with the wider group of Gimuy elders, and eventually built. He thought it was about time that a project like this was undertaken, and he reflected on a range of initiatives that council had undertaken in recent years that contributed generously to community groups from other cultures. He said of council *'When are you going to give to proper mob from country'?* (2018c).

#### 5.3 Discussion

The student project had inherent program, resource and scope limitations, however it still provided an opportunity to demonstrate the practice of reconciliation in the built environment through an intercultural design process. The incorporation of cultural knowledge as artwork, symbolism or as representations of Stories was not permissible, as doing that would have required expanded consultation with a larger group of Gimuy elders. However, the method used enabled the identification and proposed restoration of a culturally significant ancient place, incorporating visual connections to places on Country and remembrance for the Frontier Wars locally.



Figure 3. White Rock Cultural Domain view towards Bunda Mundi Ghunji (Allwood 2018).

Reflecting upon the four overarching intercultural design themes identified earlier, the fundamental requirement for decolonised project governance to support the delivery of culturally responsive outcomes is demonstrable when comparing the student project outcome with the original CRC design brief. Indigenous leadership is more difficult to demonstrate in the student project due to scope and authorship limitations, however the design process was subject to Indigenous oversight to monitor protocols and permissions and to review the design as it evolved. Relationships were central to the process and relied on willing participation, patience and respect, a mutual exchange of knowledge and an agreement on attribution and the use of project material. Response to place from Indigenous perspectives was central to the project design.

## 6.0 CONCLUSION

The *White Rock Cultural Domain* project illustrates an instance where Indigenous perspectives and aspirations were not sufficiently investigated by the local council in a place with a traditional owner group that is present, active, and connected to culture.

While recognition of Indigenous perspectives is increasing, the disconnection between policy and governance means that Indigenous input from consultation is often limited and frequently eroded by an imbalance of power and competing values. Intercultural design processes cannot succeed in mono-cultural systems of governance because the central principle of building respectful, equitable relationships is compromised. This can lead to a loss of respect and a lack of project endorsement by the Indigenous people involved, which in turn jeopardises future collaborations.

Progressing reconciliation in the built environment requires a holistic approach to reducing the non-Indigenous philosophical gap by de-colonising education, policy and systems of governance. Educating professionals, students and representatives from government agencies in methods of intercultural design will help to incorporate Indigenous perspectives far more meaningfully on public projects. Additionally, a case could be argued for creating state referral agencies to protect Indigenous interests, like those already in place for roads, resources and environment. Government authorities should regularly review and update policies and Reconciliation Action Plans to reflect more precise and ambitious values, along with measurable outcomes, to help rectify the disconnection between policy and project governance.

Projects that embed Indigenous values and narratives meaningfully are increasing in number. These projects have immeasurable value, and they offer inspiration and hope that the long journey towards achieving reconciliation in the built environment throughout Australia will gather pace.

#### ACKNOWLEDGMENT

In recognition of the Aboriginal and Torres Strait Islander peoples of Australia as the oldest continuous living culture on earth. It is their knowledge and wisdom that will guide us towards reconciliation and a shared future in Australia. I acknowledge the Gimuy Walubara Yidinji (Gimuy) people as the traditional owners of the land on which the *White Rock Cultural Domain* project is situated in Far North Queensland, and pay my respects to their elders past and present.

The directors of Abriculture, Gimuy elder Mr. Gudju Gudju Fourmile and Ms. Jenny Lynch are acknowledged for their generous contributions of time and knowledge of Gimuy culture, history and ecology in relation to the *White Rock Cultural Domain* project. I also acknowledge and thank Gimuy elder, Uncle Peter Hyde, for his friendship, humour, humility and gentle insight, and for the time he spends in our architecture practice, painting and sharing knowledge both-ways.

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## EVOLUTION OF SUSTAINABLE HUMAN SETTLEMENT PATTERNS: LESSONS FROM HUMAN SETTLEMENTS IN SMALL TANK CASCADE SYSTEMS IN SRI LANKA

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**Abstract:** Human settlement patterns in small tank cascade systems (TCS) is one of the sustainable vernacular human settlement patterns in Sri Lanka which was formed in appreciation of the natural landscape of the area offering sustainable irrigation and water management technology. With urbanisation and changing governance frameworks in the recent past, the holistic nature of this system has been lost.

This paper considers the past evolution of these TCS-based human settlement patterns, comparing and contrasting them with present and future development trends in water-scarce intermediate and dry zone areas in Sri Lanka. Using historical and present maps as a time series analysis to study the changing scenarios of human settlement components during the past few decades and analyzing development plans to comprehend the changes to date and to forecast the future scenarios, pointed to a conclusion that most of the main components in ancient cascades are presently fragmented as a result of encroachments and urbanization leading to a reduction of forest cover and landfilling. At present, these human settlements are fast losing their sustainable aspects, unable to function further as a holistic system, and the existing governance framework neglects the cascade based human settlements as an overall system thereby being incapable of achieving sustainable functional goals. This paper, therefore, proposes a framework to guide the integration of the human settlement patterns with TCSs for sustainable future development in the watersheds.

Keywords: Ancient irrigation systems, Sustainable water use, Traditional Human Settlement Patterns, Governance Frameworks

#### **1.0 INTRODUCTION**

Human settlements can be explained as the places which masses of people concentrate and settle down for living and production purpose. Further, it is a complex system which is rapidly transforming based on different driving forces. Such early settlements were characterised by the traditional norms of people's daily lives and these settlements embodied the life wisdom and creative ability of ancestors in conventional architectural environments (Setijanti et al., 2015).

Rural human settlement elements have always protected the authenticity and uniqueness of their tradition. A rural settlement is a type of rural locality where rural residents live and engage in production, resulting from interactions of residents with natural, economic, social and cultural environments (Long *et al.*, 2012; Shan *et al.*, 2012; Liu *et al.*, 2014). Besides, sensible studies about rural settlements exist all around the world while most of the traditional rural settlements reflect common characteristics.

Ning and Zha (1999) categorised rural settlements into two environments as hard (all facilities that support farmers' production and living) and soft (the intangibles that farmers can only feel in their daily life, an immaterial environment). Most of the rural settlements all around the world developed based on traditional agricultural

production and the settlement was designed to support and balance the nature and livelihood pattern of the community. The traditional knowledge systems have developed with a better understanding that people are part of the environment. Further, the settlement pattern was adequately resilient to the climate and the community together managed the space (bottom-up approach) based on their indigenous knowledge. However, there are different types of forces that caused to change this traditional human settlement pattern all around the world. In the practice of rural planning and construction, the planners often focus on the importance of society, economy and culture, neglecting the role of space form, which to a certain extent destroys the organic and various rural settlement spatial texture and hinders the inheritance of the traditional rural spatial form (Wang & Yuan, 2019).

Sri Lanka had a great history of sustainable human settlement pattern based on hydraulic structures consisted of water storage and delivery mechanisms, ensuring the sustainability of the living habitat. This system is well known as the small tank cascade system. It contains a linked series of man-made tanks, locally called 'wewa' (Tank/ Small Irrigation Reservoir). Small tank cascade system associated human settlement pattern was one of the identified sustainable human settlement patterns in Sri Lanka which reflected unique characteristics. The settlement pattern has developed with appreciation of the natural landscape of the area. Further, this small tank cascade system was the skeleton of the village due to the agriculture-based livelihood pattern. All other components within the settlement aligned with this tank pattern and functioned as a single holistic system. However at present, most of these unique features of the traditional human settlement pattern do not exist and, the pattern has significantly been altered due to different ever-changing driving forces. Most of the small tanks are abandoned, and village areas are suffering from water scarcity due to resources mismanagement and inadequacy to fulfil the increasing demand. This research attempts to discuss the unique components of the sustainable human settlement pattern existed in Sri Lanka and analyses the evolution of the traditional human settlement components within the structure with forces causing to change the human settlement components. The methodology adopted for the research is explained in the following chapter.

### 2.0 METHODOLOGY

A comprehensive literature review was conducted to identify the ancient, traditional human settlement pattern preexisted in Sri Lanka and the literature survey was further extended to distinguish specific components of the human settlement pattern and their changing factors based on relevant historical documents, journal articles, research reports, textbooks and other academic works. Mamunugama cascade system associated village located in the Mi Oya basin in the North Western Province is selected as the case study area considering the extent of the settlement, availability of the aerial photographs and satellite images, accessibility and moderate development in the watershed with yet evolving settlement features. Google Earth imagery (Google Inc., USA), other satellite imagery, aerial photographs from Survey Department of Sri Lanka (2.04 m resolution), historical literature and field data were used to identify land uses during the selected 1956, 1994, 2007 and 2019 years. Erdas IMAGINE (Erdas Inc.) and ArcGIS (ESRI, USA) geospatial data processing tools were used to analyse land-use changes in the case study area, based on Pixel-based classification to identify the evolution of Mamunugama cascade associated human settlement pattern. Primary data (based on discussions with Administrative Institutions (Divisional Secretary, Grama Niladharai or Village officers, Development officers, etc.), Irrigation Department, Department of Agrarian Development), Civil Societies (Farmers' societies, Welfare societies, Village security committee, etc.), Focus group discussion with professionals and Personal observations) were collected and analysed to understand the changing ground situation of the area.

## **3.0 BACKGROUND STUDY 3.1 Sustainable Human Settlements**

Doxiadis (1968) divided ancient human settlements into five basic elements – nature, man, society, shell (Buildings) and networks. Traditional human settlements in all around the world developed protecting the entire ecosystem while ensuring social harmony blended with their cultural beliefs and social values.

Sustainability emphasises that the villagers fulfil their opulence without damaging the natural system while preserving both the environment and its resources for future generations. Sustainability always attempts to balance three main elements, namely protection of ecosystem and resources, economic productivity for ensuring consumption, wealth and provision of social infrastructure. Sustainable livelihood was defined as the means of living against further poverty which requires necessary capabilities, assets and activities to maintain their life pattern in an economically, ecologically, and socially sustainable manner (Chambers and Conway, 1992). In contemporary literature, it is explained with a diverse range of environmental, economic, social, political, demographic, institutional and cultural factors associated with today's changing lifestyles (Satterthwaite, 1997). Further, El-Kholei (2019) highlighted that the human settlement is the interaction of economic, social, political and environmental forces. However, these forces do not individually influence the human settlements while they are affected due to the interrelationships and interdependencies of said forces. Therefore, this research finally attempts to identify driving forces related to the changes in sustainable human settlement pattern in tank cascade system (TCS) associated areas in Sri Lanka.

## 3.2 Human Settlement Pattern With Small Tank Cascade System (Tcs) In Sri Lanka

According to the past chronicles, it is mentioned that the tanks were constructed in the very beginning in the dry zone even before the arrival of Prince Vijaya who was the originator of Sinhalese nation in Sri Lanka (Withanachchi, 2019). Further, some scholars argue that there are no historical references to support this history, pointing out that tank irrigation was introduced to the country in the 6th century B.C. by the Aryan settlers (Diksith, 1986). However, most of the documents highlighted that the development of the TCS emerged based on the Indo-Aryans technical knowledge from India. This system was one of the oldest water harvesting and management systems in the world.

Most of the ancient civilisations were developed based on the water due to their livelihood pattern. The village TCS in ancient Sri Lanka was developed based on the famous royal statement which mentions that 'Let not a single drop of water go waste into the sea without benefiting the world' (King Parakramabahu, 12th Century AD). Therefore, within these settlements, the tank cascade system was the backbone of the hydraulic civilisation in Sri Lanka in ancient times.

A 'cascade' was defined as 'a connected series of village irrigation tanks organised within a micro-(or meso-) catchment of the dry zone landscape, storing, conveying and utilising water from an ephemeral rivulet' (Madduma Bandara, 1985) (Figure 1). The tanks have been joined in series by a network of canals and spillways, constructing a system providing diverse roles, namely flood harvesting, water storage and water distribution to the settlements ensuring that water resources are available for agricultural production and domestic use throughout the year, especially during the dry seasons.





A.	Lake (Zone 01)	B. Tank Bund
C.	Purana Wela (Zone02)	D. Hamlet
E. F.	Akkara Wela (Zone 03) Ground (Zone 04)	

G. Forest (Zone 05)

Figure 1. Schematic Representation of a Small Tank Cascade (Source: Panabokke, 2009)



Early human settlements were principally developed based on agricultural living pattern and further, following their beliefs and traditions bounded with water and livelihood. The main challenge they had to face was to collect and store water for production and consumption in the water-scarce intermediate or dry zones. Therefore, this human settlement pattern has essentially developed appreciating the natural environment. Further, the governing rules and orders of this system came from top to bottom based on the country's law. However, within the settlement, the community had their space management systems, appointing leaders, including Village in-charge (*Gammulandaniya*), Leader from farmers (*Gamarala*) and Irrigation Headman (*Velvidane*).

The tank cascade systems are associated with a variety of ecological and socio-economic subsystems that include, (a) The ecological system with catchment forests, aquatic habitats, and the commons, (b) Land use zoning systems, (c) Various crop combination systems, (d) Elaborate water management systems including, sluices, spills, water control weirs (*Karahankota*) with rotational water distribution systems, and (e) Management systems such as *Velvidane* (Irrigation Headman) system that dates back to pre-colonial times (Madduma Bandara, 1985). The associated spatial structure divided the entire tank cascade-based livelihood area into five broader spatial zones namely the tank, the paddy fields (Purana wela, Akkara wela), the settlement areas, ground, surrounding shrublands and forests (Figure 2).

Further scrutiny into the main zones of the conceptual drawing of this cascade based village settlement system elaborates that this village setup consisted of the following main components, (Figure 3) namely, stream, waterhole, rain-fed farms, tank, tree belts, hamlets, hamlet buffers, paddy fields and shrublands, connected with streams and tanks aligning with the natural landscape of the area offering sustainable irrigation and water management technology. Moreover, each of these components has a unique and significant justification as to why they are

needed there and they are located based on the reasons blended with natural setting, livelihood and their sociocultural beliefs.



Figure 3. Human Settlement Components (Source: Dharmasena, 2010)

This human settlement pattern is well adjusted to the geographical landscape and environmental setting of the area, and the society living in the land. Therefore, the history shows that the island was rich in fauna and flora produced within the settlement systems that sustained themselves in harmony with nature, land, terrain and cyclical weather patterns. The country has been known as the "Granary of the East," producing paddies aplenty without harming the land and the environment. In the past, its people lived prosperous lives in small peasant hamlets, achieving what its present population appears unable to achieve (Dayaratne, 2018). This human settlement pattern developed based on three principals, namely recycling or reuse principle, ecological harmony and socio-ecological harmony. Each component within the settlement has specific functions essential to maintain its sustainability (Table 2).

This human settlement pattern should be identified as a holistic system and not in isolation. Because all components are interrelated and interdepended within this system (Figure 4), the functions of one component affects the other. Further, even if a single element of the system is removed or altered, there will be an imbalance within the system affecting its long-term sustainability.



Figure 4. Conceptual Diagram of the System (Source: Author adapted Bandara,2010)

## 4.0 MAMUNUGAMA CASCADE SYSTEM

Mamunugama tank cascade system is located in Polpitigama Divisional Secretariat, North-Western province in Sri Lanka within Mi Oya river basin (Figure 5). The North-western province has the highest density of the cascade systems in Sri Lanka. Sri Lanka has two main climatic zones as Wet Zone and Dry Zone and the intermediate zone is located in between those climatic zones. This area belongs to the Intermediate zone located bordering to the Dry Zone.

The Mamunugama cascade system consists of six interconnected tanks, namely Ulpath Wewa, Athaudagama Wewa, Ihala Tibiriyawa Wewa, Wera Wewa, Mamunugama Wewa, and Kadabodagama Wewa. Except for the above six tanks, recently there were two other small tanks namely Amuna – Maha Amuna and Amuna – Mamunugama Pahala constructed privately by the villagers. All these tanks situated within the Mamunugama Cascade System are termed as small tanks/wewa (village tanks) which have an irrigated command area of 80 ha (1 ha = 2.47 acres) or less, as defined by the Agrarian Services Act No. 58 of 1979.



Figure 5. Village Tank Cascade System (Mi Oya Basin) (Source: Department of Agrarian Development, 2009)

This area has a great history which goes back to the time of Anuradhapura Kingdom (377 BC - 1017 AD), the first established kingdom in ancient Sri Lanka by the Sinhalese. Wera wewa was a pond in the Anuradhapura Kingdom and accordingly, the entire cascade system was constructed more than 1500 years ago. This village mainly depends on agriculture (paddy cultivation, vegetables and fruits). This area earlier functioned as a one holistic system, and temporal analysis below explains the gradual changes of the components within the system over this long expanse of time.

Existing paddy cultivation extent of each tank are, 1) Ulpath Wewa (9 Ac), 2) Athaudagama Wewa (17 Ac), 3) Ihala Tibiriyawa Wewa (36 Ac), 4) Wera Wewa (17 Ac), 5) Mamunugama Wewa (40 Ac), 6) Kadabodagama Wewa (23 Ac), 7) Amuna – Maha Amuna (15 Ac) and 8) Amuna– Mamunugama Pahala (30 Ac) (see Map A). In Sri Lanka, there are two major agricultural seasons termed as *Yala* (April to September) and *Maha* (October to March) based on main monsoon seasonal rainfall received by the country.

This cascade system belongs to the two Grama Niradhari (GN) divisions, namely Ihala Thibiriyaya GN and Mamunugama GN division. Total population at present is 1878, and 559 families are living within these two administrative areas. Approximately 65% of the villagers entirely depend on agriculture. Out of the other villagers, most of them are cultivating as their secondary income or for their consumption. However, this settlement based on agriculture and primary production and consumption pattern are bounded by the Mamunugama Cascade system.

## 4.1 Evolution of the Mamunugama Small TCS associated Human Settlement

The maps are divided into broader categories due to the image resolution and observations were adopted to identify changes of the components within the human settlement. Ulpath wewa is the starting point of the Mamunugama Cascade system. In the ancient king's era, there were few settlements located scattered within the forest area.

According to the map in 1956, this area is predominantly covered by forest and gradually human settlements have emerged and expanded with different forces. However, afterwards of 1994, this settlement area has further developed encroaching into most of the sustainable human settlement components within the system. At present, the home garden extent has almost doubled and paddy land extent has also increased. Due to the water scarcity, most of the paddy lands have been lately abandoned, and they are mostly cultivated during only one season. The expansion of the extent of private paddy lands causes to exceed the equilibrium point of the water supply and demand. Forest area is slightly diminishing throughout the years. However, this human settlement has gradually developed throughout the years changing the structure of the sustainable human settlement pattern.

	Year of Analysis				
Land Use Classification (ha)	1956	1994	2007	2019	
Tanks	19.06	11.30	7.12	13.97	
Home Gardens	0	38.20	51.65	63.32	
Paddy	136.98	222.15	171.55	113.14	
Forest	269.02	121.20	154.33	117.00	
Abandoned paddy				94.00	
Socio-Economic Data					
Population			936	1135	
Families			535	559	
Population Density (per 1 km <sup>2</sup> )			227	235	

Table	1:	Land	use	changes	and	Socio	-Econ	omic	Date
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Figure 6. Evolution of Mamunugama Small TCS Associate Human Settlement

Table 2. Sustainable Human settlement components and its evolution.	
Components of the TCA Human Settlements in Sri Lanka (See Figure 4)	Evolution of the components within the Mamunugama Cascade System-associated human settlement
5.1.1 Water Catchment Area (A)	
The contributory water catchment area of the tank system is the area located upstream of the human settlement. This area functions as the rainwater harvesting area and is usually located bounded by a mountain range. After collecting excess runoff water from the catchment, it is provided to the surrounding downstream area with the tanks and these small tanks do not have an adequate capacity to store water throughout the year. These small tanks are named as 'Udagama, Ihalagama, Udugama, Ihala wewa, Udangawa'.	Within this cascade system, Ulpath wewa is the starting point of the system and the tank is bounded by the mountain range (See map B). Water in the catchment is collected from rainwater through the mountain slopes. At present, the majority of forest vegetation cover in the upstream catchment area have been destroyed due to bush fire (sometimes deliberately created due to chena cultivation). Therefore, the soil layers on the mountain slopes have eroded and an increased silt level is deposited in the tanks. Approximately, 60% of the tree cover of the mountain area has been destroyed. In addition to Ulpath wewa, water is collected to the Wera tank from the mountain area adjoining to the tank (See Map B). This water catchment area is still protected with a rich forest area.
5.1.2 Mainstream (Mudun Ela) (B)	
Stream constructed based on the natural flow of the terrain and connect the tank system. Mainstream is the spine of the system, which flows from the upper area to end of the system. There are small tributaries connected to this main drain according to the natural flow and increased volume of water. Main tanks were constructed by forming large soil barriers blocking this drainage.	Mainstream flows without disturbance from Ulpath Wewa to Kadubodagama Wewa. However, at present mainstream remains dry over most of the year due to the lack of rain. In the rainy season, this is functioning without any disturbance. After Kaduboda Wewa, there are two tanks privately constructed, namely Amuna – Maha Amuna and Amuna– Mamunugama Pahala, blocking mainstream by villagers.
5.1.3 <b>Tank (Wewa) (C)</b>	
<ul> <li>Stores the water flowing down in the mainstream and this is the leading feature of the landscape. Usually, the entire livelihood, agriculture, and normal social behaviour of the villagers are strongly bonded with the village tank. Except for the main tank, there are various types of auxiliary tanks constructed for different purposes. Further, tanks are constructed in different scales based on geographical formation and natural contours. Tank itself is consisted with different components such as Vangilma, Diya Gilma, (water collecting areas which is near to the tank bund), Wawe Taulla (In-between area of the Diyagiluma and Wewa pitiya (tank ground), Madakaluwa (the deepest area of the tank which collects mud), Wawe Pitiya (when reducing the water level, this area emerges. During most of the dry season, this area becomes cattle feeding area). There are various types of tanks constructed within the system for various diverse functions. There are different types of lakes which help to recharge the groundwater table by the slow discharge of accumulated runoff.</li> <li><i>Tank bund (Wekanda) (C.1):</i> Tank bund is the boundary wall of the tank. The bund helps to store runoff water during the rainy season. The tank bund is the most crucial element of the irrigated landscape.</li> <li><i>Sluice (Horowwal) (C.2) :</i> A sluice is a movable gate which controls the outflow of water from the tank via canals. Storage Tanks (D): There were two types of tanks constructed with one functioning whereas the other was being repaired. These tanks are popular as twin tanks in the dry zone. Within this system, there is at least one main functioning tank in the village at all times to support irrigation works.</li> <li>Forest Tanks (Godawalawal): These tanks were built in the jungle above the village to protect the forest ecosystems. Tanks were supported to maintain the water circulation system of the entire cascade system and balance the groundwater table. Further, this tank helps to feed wild animals. Therefore, ani</li></ul>	According to the old system, the existing tanks are unable to provide diverse functions. All thanks within the system store water for agriculture & consumption. All tanks were converted into storage tanks. It is difficult to identify the separate components within the tank system due to excessive land use changes. Especially, Wewa Taulla, Wewa Pitiya, etc., have been encroached by the villagers. Further, they cultivate paddy within those crucial areas of the system. After 1994, there are few improvements effected by government institutions mainly an expansion of lake extent, construction of tank bunds and expansion of stream. However, those rehabilitation measures have been undertaken aiming only the individual tanks (Ihala Thibiriyaya wewa).

	Erosion control tanks (Kulu wewa): This tank was designed to collect silted water before entering into the main water storage tanks. There are numerous erosion control tanks related to each village irrigation system. Due to this tank, the silt level of the main tank is significantly reduced.	
5.1.4	Tree belt (Gasgommana) (E)	
	The natural vegetation line within the upstream area of the tank is identified as the tree belt. This area helps to reduce direct evaporation from the tanks and the exposed soil. Further, it acts as a wind barrier and helps to preserve the biodiversity of the tank environment. Large tree species such as Kumbuk ( <i>Terminalia arjuna</i> ) and Maila ( <i>Bauhinia racemose</i> ) are common in this area.	In 1956, almost the entire system consisted of unaltered tree belt and however by 1994, Ihala Thibiriyaya upper side was encroached by the villagers. According to the 2007 map, except Wera wewa & Ulpath wewa, most of the other tree belt areas have been encroached by the villagers. Further, due to the reconstruction of the tank bund and expansion of tank projects have also harmed the tree belt.
5.1.5	Stream (Kiwel Ela)(F)	
	A stream is a small tributary or canal that runs through the field and provides water for cultivation.	Water distribution pattern already exists within the system. However, still, they have farm society deciding the water distribution. Department of Agrarian Development has appointed Agriculture research officers for every division. They continuously provide assistance for farmer societies. However, at present, the burning issue is water scarcity of the area because of the fluctuation of rainfall pattern and changing or shifting of the main cultivation period (Yala& Maha). Further after 2007, one waterway from Kaduboda wewa (See map D) was abandoned. This stream at the end connects to the Mi Oya.
5.1.6	Field. (G)	
	<ul> <li>Old-field (Purana wela)</li> <li>Old Field is the central command area of the tank, an originally paddy-cultivated field located in the valley bottoms downstream of the earth bund; it is associated with the old tank and the service tenants' lands. Initially, the villagers owned this area mutually.</li> <li>Acre field or leased fields (Akkara wela)</li> <li>This area emerges after the British colonial irrigation and agricultural reforms. Acre field area was privately owned by</li> </ul>	Most of the components of the tank have been encroached because of the increased extent of cultivations. There are no separate or distinct categories as earlier. All paddy lands are privately owned by villagers. They cultivate as they wish and make their tanks expanding at the cost of the stream system. Amuna – Maha Amuna and Amuna– Mamunugama Pahala was one of the examples for that. Most of the villagers cultivate only during one season, due to the water scarcity, and they cultivate vegetables and other crops during the April-September season. However, villagers are unable to meet adequate water demand for cultivation due to increment of the paddy lands.
	villagers. Supply of irrigated water is less favourable than in the old fields.	
5.1.7	Slash and burn/chena cultivation fields (Hena) (H)	
	Fields with rain-fed agriculture area are located along the divide of the valley that hosts the tank.	Chena cultivations also still exist. However, as earlier, they do not use separate areas for that as mentioned in the past human settlement pattern while they burn forest areas and cultivate vegetables which very destructive to the sustainability of the system.
5.1.8	Interceptor (Kattakaduwa) (I)	
	Interceptor is located immediately downstream of the tank bund; it is densely vegetated with high species diversity. The primary purpose is to prevent salt from entering the downstream paddy fields. Furthermore, it acts as a wind barrier. Separate areas demarcated as " <i>kattakaduwa</i> and <i>thaulla</i> " were located adjacent to the main tank body, where their main functions were to control siltation, salinisation and iron leachate. In all cases, a significant reservation of the area between tanks was allocated for natural purification of surface water. For instance, " <i>kattakaduwa</i> " was a reservation designed to capture iron-bearing groundwater leachate, " <i>thaulla</i> " was a wetland situated to capture sediments, excessive NOX, and cations (Jayasena and Selker, 2004, Mahatantila et al., 2008). Also, the wetland also functioned to improve the biological oxygen demand (BOD) of the tank, which was crucial for fish population and human consumption. Planting tree species such as <i>'mee'</i> ( <i>Maduca longifolia</i> ) and ' <i>kumbuk</i> ' tree tends to absorb Ca from the subsoil (Tenent, 1860). The ash of the <i>kumbuk</i> tree has been used as a substitute for calcium carbonate when	Except for Ulpath wewa, the interceptor is entirely encroached by the villagers in other tanks Athaudagama Wewa, Ihala Tibiriyawa Wewa interceptors have been encroached by cultivating paddy lands and, Mamunugama Wewa and that of Kadabodagama Wewa have been encroached by human settlements.

	villagers chewing beetle. This practice indirectly indicates the ability of kumbuk trees to absorb Ca from the soil. Recent	
	studies confirm that this attenuation of Ca and other cations from the soil and water maintains desirable subsoil	
	chemistry and minimizes water salinity (Mahatantila et al., 2005).	
5.1.9	Temple	
	Temple is located on a focal position of the system. Farmers organise main activities among themselves on this	There are few temples located within the village. The villagers at present have a separate
	monastery lands.	community hall for gathering and welfare services. There is an archaeological site located near to
		the Wera wewa.
5.1.10	Hamlet (Gangoda) (J)	
	Village area (hamlet) is located downstream of the tank, close to the paddy fields.	When considering the development pattern of the Mamunugama Cascade associate human
		settlement pattern until 1956, the system was mostly dominated by paddy lands and only a few
		houses were located. However, throughout the years, this human settlement pattern has expanded
		encroaching into and changing the holistic traditional pattern. Afterwards of 1994, in Ihala
		Thbiriyaya, Kadubodagama wewa and Mamunugama wewa areas, most of the parts were
		encroached by the villagers. However, this pattern has continuously expanded up to 2019, and total
		extent similarly disturbed has almost doubled. Still, there are conflicts related to the illegal
		expansion of their own home gardens.
5.1.11	Scrubland (land) (K)	
	In the dry area of the tank is the scrub area which serves as grassland for the cattle.	Still, there exist scrub lands within the area. However, they are hard to separate from the existing
		human settlement pattern. Further to these scrublands, the areas covered by forest and abandoned
		paddy lands are also used for feeding cattle.
5.1.12	Drainage network	
	Well maintained drainage network was used to link tanks in the system as well as to supply water to the command	The existing drainage network is abandoned due to the scarcity of water and unauthorized
	areas.	encroachments. After the rain, the tanks spill over and this drainage system is used to collect and
		discharge water through paddy lands.

#### 5.0 DISCUSSION

Small tank cascade system associated sustainable human settlement pattern in Sri Lanka has been changed due to the expansion of human settlement pattern. As a result of that, all components existed within this pattern have been altered due to different driving forces. Rural-urban development always neglected our indigenous knowledge and uniqueness of the human settlement components, degrading their important distinctive functionality in the system leading to the degradation of the entire system affecting its holistic behaviour. Mamunugama cascade system associated human settlement system is one such sustainable human settlement system that prevailed since ancient times dating back to 377 BC. The various driving forces which have led to significant alterations in the human settlement pattern affecting its sustainability in the long run are discussed herein below.

## **5.1 Natural Forces**

The average annual temperature pattern in the area has gradually increased from 28.2°C in 2000, and at present, the average temperature of the area is 28.3°C. Further, rainfall pattern has significantly fluctuated over the years between 2004 to 2018. The unpredicted weather pattern directly influences the cultivation in Yala (February - May) and Maha seasons (September - January) and behaviour of the people. Further, a deficiency of rainfall has led to abandon the total cascade system. At present, the capacity of the tanks have been expanded (Ulpath wewa, Atahudha wewa, Wera wewa and Mamunugama wewa) and the tank bunds have been raised (Wera wewa and Ihala Thibitriyaya Wewa). As a result of this, in order to function properly, the system requires heavy rainfall for spilling over the upstream tanks. In 2010, the national programme, "Gami Diriya" has initiated a forest re-planting programme in the area. This project was unsuccessful due to the scarcity of water. The previously existed groundwater recharging system has now been destroyed due to the fragmentation of the system as well as due to changing functions of the system. There exists no proper regulatory and monitoring mechanism for privately owned wells and people are increasingly extracting groundwater constructing their own wells. In 1956, this area was predominantly covered by forest and forest cover has been gradually decreasing throughout these years due to the human activities (burning and cutting for constructions, chena cultivation, expansion of lakes, paddy cultivation and canal construction, etc.).

#### 5.2 Socio-Economic Forces

Increasing population is one of the leading forces behind the change in the home gardens and paddy lands in an area. In 1988, the national programme named as '*Jana Saviya*' (People's Strength Poverty Alleviation Program) was initiated, mainly focusing on alleviating poverty in village areas. There are subsidy schemes introduced by the government to improve the living standards of the people live in rural areas.

\After 2013, the national programme 'Divinaguma' with a similar aim was initiated to improve the agricultural-based livelihood of the rural community. The government provided fertiliser and seed subsidies and facilities to increased agricultural production. At present, Gamperaliya and Enterprise Sri Lanka loan scheme have been launched to encourage farmers and youth generation. Therefore, most of the farmers have expanded their cultivation lands without considering the infrastructure facilities, climate conditions and market prices. The existing social system has been changed due to the governance system of Sri Lanka, further changing the behaviour, attitudes and traditional agricultural pattern that existed in ancient times.

#### **5.3 Political/Institutional Forces**

Until 1956, this area seemed to bare predominantly rural characteristics and the government interventions were quite insignificant. After 1989, these areas were developed based on the '*Gam Udawa*' (Village Reawakening) housing development programme initiated by the Government ruled in that era (1989-1993). This is one of the massive programmes initiated within that period and most of the rural areas were regenerated providing housing and infrastructure facilities. After 2013, this area was further developed due to the improvement of the accessibility under *Gama Naguma* national programme. Therefore, urbanisation expanded along main arterials, and rural villages were converted into suburbs. However, still a little away from the main roads, this rural settlement pattern exists with the fragmented traits of the settlement components.

At present, these human settlement components are managed by the different agencies from three levels of governance (National, Regional & Local). Within this system, there are conflict of interests and power sharing relations among institutions. Therefore, under the present system of governance, the existing farmers' societies have no convincing powers and they have no proper space to implement their own decisions based on traditional and indigenous knowledge.

Further, the different agencies aforementioned are implementing small scale projects based on sectors without having a proper coordination among authorities and proper monitoring system in place without proper Master Plan or holistic approach. According to the international and global agendas (Sustainable Development Goals, Climate resilience, Women empowerment & Empowering Development Countries), diverse projects and programmes were implemented by responsible sectoral and administration institutions (Irrigation Department, Department of Agrarian Development, Divisional Secretariat Division, Wayamba Development Authority & Local Authorities) acquiring funds from various organisations. However, due to the existing governance system, there is a considerable gap and issues between design and implementation.

At present, there are two major projects initiated intending to develop this system. Irrigation Department already has initiated to construct a new channel bringing water from the Mahaweli River basin. According to this project, trans basin water will be pumped to revive the cascade systems within the area. The second project is initiated to rehabilitate and restore this cascade system. However, those projects are still implemented without considering this cascade as one holistic system. In future, these projects will be the driving forces to change this presently existing structure.

There are various forces govern to change this spatial structure and there are few drivers initiated to implement projects to enhance the livelihood of the settlement communities in the area. However, these various interventions undertaken within this sustainable human settlement system without considering the actual carrying capacity of the area could inadvertently lead even to the eventual collapse of the entire sustainable rural human settlement pattern existed in Sri Lanka.

## 6.0 CONCLUSION

In water scarce intermediate and dry zone regions of Sri Lanka, there existed a sustainable human settlement pattern blended with their ancient wisdom and based on their indigenous knowledge, facilitating an agricultural living pattern. Due to the rapid development, most of the socio-economic elements and governance system supporting this unique irrigation cascade based system have been changed. Further, most of the salient components of the sustainable human settlement pattern were abandoned over time and their traditional management knowledge was neglected while various institutions came forward to solve contemporary burning issues. Therefore, these integrated systems were fragmented due to the negligence of the social-economic, natural and political forces governing their mere existence and flourishing. Further, the continuation of the existing gap of the proper space management system within this human settlement pattern leads to abandoning of this precious system.

A massive number of small tank cascade systems same as Mamunugama are located in the intermediate zone as well as the dry zone in Sri Lanka. According to the literature, half of the systems have been abandoned, and villagers are continuously struggling with water scarcity and other land management issues. Therefore, it is essential in future to restore this system with proper conservation and space management measures as well as the implementation of policy framework to sustain this pre-existed traditional human settlement pattern in Sri Lanka with a holistic approach to preserve its unique and diverse functioning.

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# RURAL DEVELOPMENT INITIATIVES IN MALAYSIA: A CASE STUDY OF THE 21ST CENTURY VILLAGE PROJECT

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Abstract: Over 70% of the total land areas in Malaysia is classified as rural. This requires an effective rural development programme to reduce rural-urban drift as well as attain some of the Sustainable Development Goals (SDGs). To improve the low living condition in rural Malaysia, the government has introduced different development initiatives such as the 21st century Century Village programme. This programme was launched in 2013 to encourage the youth to remain, work and start businesses in villages. The programme focuses on implementing three concepts- Program Desa Lestari (or Model Village), Large Scale Fruit and Vegetable Farming and Rural Business Challenge (RBC). Consequently, this study examines the effectiveness of the 21st century programme in reversing rural-urban drift. Data were gathered through secondary sources and analysed using both inferential and descriptive statistical tools. The study gathered that between 2013 and 2016, the programme disbursed a total sum of RM204.7 million (USD53.31 million) as investments in services, tourism, farming, retailing, manufacturing and agricultural sectors across the 80 villages in the country. However, despite this huge investment in a programme aimed at encouraging more youth to return to rural areas, the reverse has been the case. The rural-urban drift continues to increase at a higher rate when compared to the pre-intervention period. The study recommended that in addition to the effective review of the management strategy of the projects, government should upgrade the operational processes of the projects to make it more attractive to the youth, while encouraging private sector investment in the rural areas through effective incentive programmes.

Keywords: Sustainability, Rural Development, SDGs, Youth Empowerment

#### **1.0 INTRODUCTION**

Sustaining the rural economy is essential for GDP growth and balanced national development. Over one-fifth of the world's population derive their livelihood through peasant agriculture<sup>10</sup>- a dominant source of livelihood in many rural areas in the world. Since the advent of industrialization, peasant farmers continue to contribute to the growth of cities and urban areas through the production of livestock, food and other agro products to sustain lives and industrial productions in these urban areas. Thus, the continued progress and survival of urban areas largely depends on a progressive rural economy. Despite its importance, the ILO calculations indicates that 88% of the extreme poor live in rural areas, where poverty rates are typically quadrupled and decent work deficits are typically severe (WESO, 2016).

The overwhelming concentration of wealth, assets, purchasing capacity, economic activities, and a variety of infrastructural facilities and social services in the urban centres as well as the continued neglect and degradation of rural environments have contributed to the wide gap between the developments in rural and urban areas (Ellis, 2003; Ajaero and Onokala, 2013). Other factors leading to rural-urban migration can be categorized as the pull and push factors. The pull factors refer to the facilities and opportunities that make migrants want to move to urban areas such as anticipated better job opportunities with associated income, education, access to amenities and infrastructure, healthcare and cleaner environment; while push factors include what makes people migrate from rural areas. These include inadequate infrastructural facilities, lack of employment and social opportunities, poor education, and facilities (Hoffmann, Konerding, Nautiyal& Buerkert, 2019).

These factors have combined to generate the huge rural-urban migration. Infact, the UN 2018 report estimated that by 2050, the urban population would have increased from the current 55% to 68% of the global population, and the gross number of the urban population in developing countries will have doubled compared to 2005<sup>11</sup>. The implications of this substantial increase are quite severe on health and livelihoods of urban residents. The challenges currently faced by many countries in meeting the needs of their growing urban populations will also expand in different dimensions with more

<sup>&</sup>lt;sup>10</sup> https://www.soas.ac.uk/cedep-demos/000 P535 SRL K3736-Demo/unit1/page 08.htm

<sup>&</sup>lt;sup>11</sup> https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html

pressures on the limited urban infrastructure such as housing, roads and transportation, energy systems and other infrastructure, as well as for employment and basic services such as education and health care.

To reduce the trend, governments in different jurisdictions and multinational organizations have introduced different initiatives and intervention programmes to reduce rural-urban drift. Such projects include the Millennium Village Project, Indira Awas Yojana (revamped as Pradhan Mantri Gramin Awaas Yojana), 21st century village project, and several other joint and collaborative initiatives in different parts of the world. The Millennium Villages Project (MVP)- a 10 year, multisector, rural development project-was initiated in 2005 by the trio of Earth Institute at Columbia University, the United Nations Development Programme, and Millennium Promise. The project operated across ten sites in ten sub-Saharan African countries to achieve the Millennium Development Goals (MDGs)<sup>12</sup>. The Indira Awas Yojana (IAP) is a social welfare flagship programme, launched by the Indian Government in 1985, to provide housing for the rural poor in the villages across India. Under the IAP scheme, financial assistance is provided to the persons classified as below-the-poverty line (BPL) for construction of dwelling units<sup>13</sup>. The 21st century project (21CV), on the other hand, was launched in 2013 by the Malaysian government with the main aim of encouraging the youth to return, remain, work and start businesses in villages across Malaysia. However, despite the huge resources spent on the various 21cv project, the rural population has continued to reduce in numbers. Consequently, the aim of this paper is to examine the effectiveness of the 21st century programme in reversing rural-urban drift.

This paper is divided into three parts. This first part of the paper presents brief information on Malaysia as well as an overview of rural development programmes in Malaysia. The second part reviewed the 21CV programme. The final part highlights some of the achievements and challenges of the 21cv programme.

## 2.0 THE STUDY AREA- MALAYSIA

Malaysia is a country located on 4.2105° N, 101.9758° E in Southeast Asia. As indicated in figure A below, the country is divided into two similarly sized regions- Peninsular Malaysia and East Malaysia (Malaysian Borneo). Malaysia consists of 13 states and the federal territories (Kuala Lumpur, Putrajaya and Labuan). Information from the department of statistics indicate that the country has a total population of 32.58 million<sup>14</sup> made up of Malays, Chinese-Malaysians, Indian-Malaysians, and other residents.

<sup>12</sup> https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(18)30065-2/fulltext

<sup>13</sup> https://pib.gov.in/newsite/mbErel.aspx?relid=86168

<sup>14</sup> https://www.dosm.gov.my



Figure A: Map of Malaysia (showing the Eastern and Western Regions)

Malaysia has a total land area of 330,803 km<sup>2</sup>. The rural area covers 70% of the total land area (Azman, 2018) with 16,534 villages spread across different parts of the country (Zamani, 2016). The revised UN population report for 2018 also indicated that over 7,679,000 persons reside in the rural areas spread across the country (UN DESA, 2018). Hence, adequate development of the rural area will have wider impact on the overall development of the country.

## 3.0 RURAL DEVELOPMENT INITIATIVES IN MALAYSIA

When Malaysia gained independence in 1957, the rural areas, particularly, had a high poverty level, low productivity, lack of access to basic infrastructure, poor health and education. The government however introduced different rural development initiatives such as the Village Action Plan- an initiative under a programme called "Gerakan Daya Wawasan" (Visionary Capability Movement); Rural Advancement Programme (INFRA), Rural Basic Infrastructure (RBI) Programme (such as the provision of road and transportation facilities, access to clean water, 24-hour electricity and infrastructure maintenance) and other initiatives to stimulate growth and development in the rural communities. Ngah (2013) noted that these initiatives represent a mixture of approaches from technocratic model, to reformist and free market, and the emphasis on rural development approaches vary from different periods of development, with observed overlapping of objectives in some cases. Also, while these initiatives have stimulated rapid progress and resulted in substantial drop in the national poverty rate from 49 percent to less than 4 percent between 1970 and 2009 (Malaysia, 2010) and the provision of basic infrastructure across the rural areas, the poverty rates are still higher in rural areas compared to urban areas (Ngah, 2013), and urban households earn on average 80% more than rural households (Ng, 2018). This has resulted in continued rural-urban drift. The 2018 report of the Khazanah Research Institute noted that there were 1.9 million households in the rural areas in 2009; and within a period of seven years, this figure had reduced to 1.5 million households in 2016 (DOSM, 2018).

## 3.1 The 21st Century Village Programme (21CV)

The 21st Century Village Programme (21CV) is a rural development initiative launched in 2012 to create jobs and wealth for the rural dwellers through the provision of a vibrant economy that would stimulate an increase in the rural income level, fast-track provision of infrastructural facilities, and attract the youth to work and live in the rural community. The programme is a joint venture between the federal and state government, research institutions and the private sector. Laidin (2016) noted that overall target of the 21CV was to create 132 new 21CVs, initially by 2015, and later extended to 2020 depending on fund availability. Activities in the 21CVs encompass a number of economic sub-sectors including agriculture, tourism, plantations and cottage industries. About 37,800 households or 189,000 people are expected to benefit from this 21CV programme (GTP, 2013).

The 21CVs has been anchored through active onboarding of 39 state-driven modern integrated farms; 15 private-sectordriven large-scale fruit and vegetable farms; 39 enhanced village cooperatives in tourism, plantation and cottage industries; and 39 university, technical and vocational graduates as youth entrepreneurs (Laidin, 2016). Participating villages were selected based on key factors which include- land availability; existence of functional and effective cooperatives operating businesses, as well as the existence of potential or unique resources that can be developed into sustainable rural businesses. Selected villages were spread across Peninsular Malaysia, Sabah and Sarawak; and the projects were financed by the federal, state and private-sector sources.

To achieve the stated goals and facilitate reverse migration (urban-to-rural) the 21cv programme was implemented under three models- Program Desa Lestari (or Model Village), Large Scale Fruit and Vegetable Farming and Rural Business Challenge (RBC).

## 3.1.1 Desa Lesteri (Sustainable Rural Area)

Desa Lesteri (DL) is a rural economic development initiatives established to support village communities towards attaining active participation in many sectors such as agriculture, manufacturing and rural tourism. DL is designed to- enhance potentials of the communities towards planning and implementing development projects in the villages; strengthen economic and entrepreneurship activities of the villagers by opening new employment opportunities; as well as increase income opportunities to residents. Under the DL, each selected community is required to setup a cooperative that will comanage the developmental projects. The cooperative generates a community-focused proposal and also serves as an agent of economic development at the village level. DL facilitates active involvement and participation of the community in the review, planning, design and implementation of these projects (Zamani, 2016). Selected communities can implement projects in any of the sectors indicated in the DL programme- agro-services, tourism, farming, retailing, manufacturing and agriculture.



Figure B: Desa Lestari process flow (Source: Zamani (2016))

The process flow for DL is as indicated in the figure above. The development process kickstarts when the the selected village comes up with project proposal through active engagements of the households and villagers. The proposals are then submitted to the Ministry of Rural development (MRRD). MRRD team reviews all the proposals and select the most suitable based on laid down procedures and available financing. Villagers to be involved in the implementation of the shortlisted projects are then trained before fund disbursement. This stage is crucial to ensure the villagers are well trained on expectations before, during and after the project implementation. Villagers are also required to setup their own

cooperatives to aid easy monitoring and management of the projects. These cooperatives then anchors actual implementation of the selected projects. Through this process, the MRRD and other agencies monitor and supervise the implementation exercises. Upon completion of the project, the MRRD continues to monitor and gather feedback towards improving subsequent implementation plan across shortlisted villages.

The project fund allocation was utilized in the following pattern: economic development activities- 80%; infrastructural facilities (roads, potable water supply, etc) - 15%; while human capital & social activities account for 5%. The sectoral breakdown of the economic activities component is as indicated in the table below.

Sector	Number of villages	Percentage
Services (agro)	33	41
Tourism	29	36
Farming	7	9
Retailing	4	5
Manufacturing	5	6
Agriculture	2	3
Total	80	100

## Table 1: Classification of the sector by the number of villages. Collated from Zamani (2016)

Information in the table above indicate that 33 villages engaged developed services-related projects while 29 villages developed tourism-related project. The services and tourism sectors were thus implemented by a total of 63 villages. The remaining villages implemented projects such as farming (7 villages), retailing (4 villages), manufacturing (5 villages) and agricultural (2 villages). The high number of villages of villages in the services and tourism sector could be as a result of the growing potential of the country as tourism centre as well as the foreign exchange potentials realisable from tourism.

## Actual project implementation.

The figure below indicates the specific projects implemented in the DL programme. The projects are homestay and facilities (services), jungle tracking (tourism), handcraft and T-Shirts shops (retailing), chalet (ecotourism), stingless beehives (agriculture, farming and manufacturing), futsal hall (services), agrotourism (tourism), rental and sports facilities (services and tourism) and infrastructure.



## Source: Zamani (2016)

Two iconic projects under the DL initiative- the stingless bee farming project and the construction of cabin chalets to support the development of homestay programmes. A total of 29 villages ventured in the stingless bee farming project, achieving yearly incomes between RM10,000 and RM19,000 (NTP, 2015 and Zamani, 2016). Meanwhile, 10 of the villages that participated in the construction of cabin chalets and homestay programme generate between RM18,000 and RM54,000 per annum (NTP, 2015). Information contained in the table below further indicates that all states in the country have benefitted from the homestay initiative. In fact, the homestay initiative has generated much interest across the villages that a total of 163 homestay chalets are already built and managed across the different villages.

State	Homestay
Johor	21
Melaka	7
Pulau Pinang	10
Selangor	15
Sarawak	13
Kedah	15
Negeri Sembilan	12
Perak	10
Terengganu	8
Kelantan	8
Pahang	16
Perlis	3
Sabah	22
Wilayah Persekutuan (Labuan)	3
Total	163

## Table 2: Homestay projects across selected villages in the country Collated from: iDesa<sup>15</sup>

Under the 21CV, the Ministry of Rural and Regional Development (Kementerian Kemajuan Luar Bandar dan Wilayah or KKLW) continues to collaborate with other agencies to enhance these activities by financing asset purchases and providing management support.

## **B.** Large scale fruit and vegetable farming

The 'Large Scale Fruit/Vegetable Farms' Entry Point Project is a 21CV initiative implemented to offer job opportunities in rural communities. National Transformation Programme (NTP) Annual Report 2015 indicated that over 200 acres of farmland are planted with different kinds of premium export-quality fruits. Tonnes of pineapples, bananas, papayas and melons are marketed within the country and abroad, reaching as far as Korea and Japan (NTP, 2015).

## C. Rural Business Challenge (RBC)

A healthy business competition necessarily bring about better business processes with the aim to exceed customer expectations. This notion could be observed in the RBC concept. The RBC is the third programme under the 21CV initiatives aimed at encouraging entrepreneurs to develop cutting-edge business solutions or enhancements with unique value propositions. Winners of RBC competitions (RBC) are to set precedence for Malaysia's youth in reversing urban migration. The RBC is 5 key targets- Youth Entrepreneur Driven; Business Plan Competition; Open To All Malaysian Youth; Business Operating In Rural Areas, and the competing entrepreneurs are required to be operating in these Sectors : Manufacturing, Services, Tourism , Agriculture. The NTP report indicated that the 31 winners in 2012 and 2013 have provided 213 job opportunities and created 180 new entrepreneurs. The average increase of income for 2012 winners (in 2014) was 171 percent; for the winners in the 2013 RBC (in 2015), the average increase was 106 percent. As at 31 December 2015, the average monthly income increment- 113.96%, creating 350 new entrepreneurs and 1300 new jobs.

<sup>&</sup>lt;sup>15</sup> <u>http://ims.infra.gov.my/iDesa\_en/homestay.php</u>

## 4.0 IMPLICATIONS OF THE 21CV PROJECT

The impact of the 21CV project are examined vis-a-vis the financial implications, infrastructural amenities, economic implications and demography.

## 4.1 Financial implication of the 21CV projects

A total of MYR 137 million (US\$ 37 million) was allocated for the 21CV Desa Lestari programmes (Laidin, 2016) with an average value of \$USD80,000 to \$USD250,000 per village (Zamani, 2016); while another MYR 8 million (US\$ 2.2 million) is for large-scale farming programmes. Since its takeoff in 2012, a sum of RM59.07 million worth of grants was also awarded, under the RBC programme, to 77 aspiring young entrepreneurs who run their businesses in the rural areas.

## Table 4: Financial Implication of the 21CV

21CV Initiative	Amount spent	Percentage
Desa Lestari	MYR 137 million (US\$ 37 million)	67
Large Scale Farming	MYR 8 million (US\$ 2.2 million)	3.9
RBC	MYR 59.07 million (US\$14.11 million)	29.1
Total	MYR 204.7 million (US\$53.31)	100

Information contained in table one above thus indicates that the total financial implications of the 21CV project is MYR 204.7 million. Desa Lestari programme account for the largest share with 67%. This is followed by the RBC with 29.1% while the large scale farming accounted for 3.9%. Different initiatives included in the Desa Lestari programme require huge capital expenditure, hence its high proportion in the total 21cv financial implication.

## 4.2 Infrastructural Amenities

In the Khazanah Research Institute (KRI) report on households in the rural areas in Malaysia indicates that nearly nearly all households have access to electricity. The figures for rural households in Sabah and Sarawak stood at 98.7% and 99.3%. There has also been commendable increase in access to water supply, improved public health facilities and social amenities. These improvements in the rural areas are partly due to the 21CV projects embarked upon in these villages (Ng, 2018)

## 4.3 Economic Development

The 21CV initiative brought about improved economic activities in the rural areas. Programmes under the 21CV initiative have created several job opportunities as well as increased income. The KRI report also noted although urban income is still higher than the rural income, there is an appreciable increase in rural income when compared to the pre-21cv period (Ng, 2018)

## 4.4 Rural Population

While the rural economy has experienced some improvements, the population has continued to drop with an increasing rate of rural-urban migration. The table below indicates that the 21CV programmes have not realized its main target-reverse migration. The year-on-year percentage reduction indicates that years 2012 upwards have some of the highest reduction in rural population when compared to the population figure in the preceding period. For instance, rural population reduced from 8,014,291 in 2012 to 7,936,448 in 2013 thus representing a reduction rate of 1.02. The highest reduction rate in the periods under review occurs between 2015 and 2016, a period when the 21CV has some of the best programme outcome from the programmes especially the RBC and Desa Lestari.

Year	Population	Percentage
2000	8,815,864	0.3275604265
2001	8,787,081	0.464910321
2002	8,746,418	0.5871751616
2003	8,695,361	0.6846853314
2004	8,636,230	0.7519211011
2005	8,571,777	0.8313509435
2006	8,501,103	0.910282575
2007	8,424,417	0.9706558369
2008	8,343,431	0.9989213054
2009	8,260,911	1.022439795
2010	8,177,303	1.032702025
2011	8,093,719	0.9910795603
2012	8,014,291	0.9808292072
2013	7,936,448	1.020663517
2014	7,856,262	1.0916921
2015	7,771,422	1.171644889
2016	7,681,423	

**Table 5: Population of Rural Malavsia** 

Adapted from: United Nations Population - One sample t test results - Confidence interval: - The hypothetical mean is 0.000000000000 while the actual mean is 0.864907130994;' thus the difference between these two values is 0.864907130994 - The 95% confidence interval of this difference: From 0.737646573099 to 0.992167688889. Intermediate values used in calculations: - t = 14.4861; df = 15 - Standard error of difference = 0.060

Mean	0.864907130994		
SD	0.238824322397		
SEM	0.059706080599		
N	16		

The two-tailed P value is less than 0.0001. By conventional criteria, this difference is considered to be extremely statistically significant. This implies that the rural-urban reduction rates are quite significant and thus require a more integrated approach to reduce the phenomenon. Reducing rural-urban migration is not only crucial to the development of the rural economy, but also essential to sustainable development of the urban centres through food availability and raw materials for industrial production.

## 5.0 SUMMARY AND CONCLUSION

A vibrant rural economy is essential for a progressive national development, sustainable urban growth and resource independence. However, the continued rural-urban migration poses significant threat to the attainment of these goals. Residents in the rural areas usually move to urban centres due to the pull and push factors. The pull factors refers to the anticipated better living conditions and infrastructural facilities in the urban centres while the push factors refers to the poor living conditions and inadequate amenities usually attributed to rural areas. People migrate to urban centres in search of better job opportunities, education and to achieve a living standard.

To assess the rural-urban migration in Malaysia, this study noted the rural development initiatives being implemented by the government in Malaysia. These include the Rural Basic Infrastructure (RB), the 21st century village project, among others. The study reviewed the performance of programmes under the 21CV- Desa Lestari, Large Scale Fruit and Vegetable Farming and the Rural Business Challenge (RBC). From its inception to the year 2016, the 21CV initiative disbursed a total sum of RM204.7 million (USD53.31 million) as investments in services, tourism, farming, retailing, manufacturing and agricultural sectors across the 80 villages in the country; with the main aim of facilitating the return of youth to the villages.

The study further reviewed the implications of the 21CV on the rural communities. Findings in the study indicate that the project has impacted the lives of the residents in the rural communities in many positive ways. For instance, under the Desa Lestari 21CV, different projects were implemented in 80 villages-33 villages engaged developed services-related projects while 29 villages developed tourism-related project. The services and tourism sectors were thus implemented by a total of 63 villages. The remaining villages implemented projects such as farming (7 villages), retailing (4 villages), manufacturing (5 villages) and agricultural (2 villages). Some of the notable projects in Desa Lestari villages are homestay and facilities (services), jungle tracking (tourism), handcraft and T-Shirts shops (retailing), chalet (ecotourism), stingless beehives (agriculture, farming and manufacturing), futsal hall (services), agrotourism (tourism), rental and sports facilities (services and tourism) and infrastructure.

The second 21 CV programmes- Large Scale Fruit/Vegetable Farms- facilitated plantation of different kinds of premium export-quality fruits. Tonnes of pineapples, bananas, papayas and melons on over 200 acres of land. The agricultural output are exported to Urban areas in Malaysia as well outside the country. The fruit and vegetable project thus created increased job and better income opportunities in rural communities. While the third 21CV project- the Rural Business Challenge-encouraged young entrepreneurs in the villages to develop cutting-edge business solutions or enhancements with unique value propositions. Winners were provided with business support loans to facilitate further expansions and creation of more business opportunities for the rural dwellers.

The 21CV initiative thus scored very high on the economic developments, infrastructural provisions and job creations the 80 selected villages. However, this does not translate into reverse migration In fact, the study indicates the rate of population decrease in the rural communities increased during the 21CV implementation period, thus suggesting the need for a more integrated approach towards achieving the much desired urban-rural migration.

## 6.0 **RECOMMENDATIONS**

- 1. Inclusive strategy: While the government has made good efforts with respect to the 21CV and other rural development initiatives, there is a need to ensure more inclusive engagement. There should be more community engagement to ensure that the community itself takes ownership of the project. The private sector should be actively encouraged to invest in the project so as to further make the projects sustainable in the long term.
- 2. In addition to the use of traditional development economists and agriculturists, creative ideas and innovative inputs should be gathered from ecologists, scientists, anthropologists, psychologists, experts on arts and culture, tourism operators, engineers and geologists. Such expanded team will be helpful in determining the most appropriate land location for the some of the planned rural development initiatives, especially those that related to agriculture and topographical analysis
- 3. ICT systems should be deployed to the villages to encourage adoption and utilization in the various 21CV processes. With the high mobile communication penetration rate, the use of ICT services will ensure greater results and community impact.

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## IMBIBING THE *ADIVĀSI* IDENTITY IN THE INDIAN RURAL PLANNING FRAMEWORK: BALANCING SOCIO-CULTURAL NEEDS AND ECOLOGY.

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Abstract: The innate relationship of India's Indigenous people, or adivāsis, and their land embodies unique land management practices that are beginning to gain national and international recognition. Their lifestyles, socio-cultural practices and sustenance mechanisms rely heavily upon the forests they live within, and this interdependence has created a homogenous ecosystem of humans as an integral aspect of ecology. Since 1981, over 24.3% of their traditional lands have been re-purposed for Indian 'growth' and 'national interest' projects including mining, industrial land-use, infrastructure developments or towards 'Protected Areas'. This bureaucratic notion of 'nation building' is beginning to risk the erasure of adivāsi communities as they continue to be perceived by developers and government officials as 'enemies of the ecology'. Lack of recognition of their customary adivāsi rights and their misrepresentation in land use and development planning processes due to the vested interests of politicians and developers has led to the 'belief' of "government ownership" over traditional community forests and resources. India's diverse socio-political history of transitioning governmental frameworks have additionally and indisputably led to land use planning methods and development rights which neglect the true ownership of traditional lands. In many ways the struggle of the Dongria Kondh in Orissa presents the current status of India's Indigenous communities and offer directions for them to obtain rights over their legal holdings. Despite possessing legal tools such as the Provisions of Panchavat Raj Act 1996 and the Forest Rights Act 2006, their pursuits to claim a right over their traditional lands have failed due to violation and subversion of India's Constitutional laws. This paper critiques the current Indian legislative and planning framework in order to decipher participatory planning methods that involve adivāsi communities at all planning stages to balance their socio-cultural needs and the built environment's demands. It further draws upon community-based conservation initiatives that have been adopted in other contexts so as to decipher methods that could perpetuate environmental, socio-cultural and economic justice for the adivāsis.

Keywords: Adivāsi; Dongria Kondh; land management techniques; rural planning; community-based conservation.

## **1.0 INTRODUCTION**

India's vibrant socio-political history is a testimony to its multicultural identity as a melting pot of various folk groups and their associated practices. The Indian Indigenous people, or *adivāsis*, constitute about 8.6% of India's population (approximately 67.7 million people) with approximately 90% of these people living in rural areas mostly around Central India (Government of India 2013) [Refer Figure 1(a) & (b)]. *Adivāsis* – meaning earliest (*adi*) inhabitants (*vāsi*) of India, for administrative purposes, are termed as Scheduled Tribes under the *Government of India Act 1935*. With over 200 distinct cultural groups that speak 100 different languages, *adivāsis* continue to prevail as non-homogenous multi-cultural groups that reside in mineral-rich mountainous or hilly areas or thick forests that are a bounty of resources and away from fertile plains that have been cleared for agricultural or other 'formal' purposes (Minority Rights Group International 2019).



Figure 1(a): Adivāsis of India - various Indigenous groups and their location on the map of India

Historically, long before Portuguese, Dutch, French and British colonization arrived in India, the *adivāsis* developed symbiotic ecological and cultural inter-relationships with their lands that they maintained for countless centuries. The prevalence of colonial ideologies in the last 300–400 years in India has, perhaps, percolated deep and established a Western legislative and planning system that endorses *laissez-faire* "resource-based development" rather than recognizing true land ownership rights. This can be traced to the 18th century British rule that was brought in to unify colonial land policies for *adivāsi* lands that were once secluded from legal land ownership or formalized planning tools that were under previous Indian provincial administrations (Bijoy, Gopalakrishnan & Khanna 2010). The influx of government officials, formalized administrative measures, and moneylenders saw the invasion of bountiful forests and their traditional lands, which eventually led to the forced yet ineffective formulation of administrative measures that intended on protecting the vulnerable position of the *adivāsis* (Minority Rights Group International 2019) against formalised land management legislation and movements such as the *Zamindari* system<sup>16.</sup>

<sup>&</sup>lt;sup>16</sup> The Zamindari system introduced formalized concepts of private property. It began with permanent settlement of the British in 1793. It conferred control over vast territories (including traditional adivāsi lands) to feudal lords who collected revenue for the British. Land on the plains, beyond the boundaries of the East India Company, was formally titled in the early 1800s under local intermediary landlords, known as zamindars, who collected revenue on behalf of the colonial government. These feudal lords were often the inheritors of ancestral land titles, had great powers within the territories assigned to them, but could be evicted if they did not perform according to set criteria, especially if they did not pay the required taxes) (Oskarsson 2018).


Figure 1(b): State-wise distribution of *adivāsis* and their socio-economic status

The colonial aftermath saw political representation of *adivāsis* in the Parliament and state legislative assemblies. As per Article 330 and 332 of the Indian Constitution, 7% of the seats are reserved for the members of scheduled tribes at both central and state levels (Bijoy 2003). In more recent years, laws such as the *Provisions of Panchayat Raj Act 1996* and *Forest Rights Act 2006* have been made to protect their land ownership interests whilst offering them a position of autonomy over their lands and to function as 'institutions of self-governance' (Ramanathan 2015).

Despite the provision of legal tools that favour *adivāsi* interests, the infiltration of colonial ideologies meander within various administrative 'loop-holes' and have led to multi-fold transformation of the socio-economic, political and cultural outlook of the modern Indian milieu (Bijoy 2003). Today *adivāsis* continue to reside in the most deprived households and roughly 44.8% of these tribes live below the Poverty Line (Government of India 2013). Over 95% of scheduled tribes have been deemed as being socio-economically marginalised (Minority Rights Group International 2019), and continue to reside in inaccessible geographical locations that are hosting mixed nationalized and privatised land ownership regimes. They are often nationally perceived as 'primitive beings' or 'encroachers on protected or forest land', of which much of their 'lands' are today mineral rich and water resource prolific (Bahuguna et al. 2016).

These Western economically perceived untapped resources have intensified the *adivāsi* struggles to protect themselves from being uprooted and ensuring the maintenance of their sustainable land management practices. For the former reasons, many *adivāsis* have been evicted, displaced and resettled in lands that have no meaning to their traditional ways of living, resulting in them becoming 'placeless beings' (Bhengra, Bijoy & Luithui 1999; Ramanathan 2015). Overarching land-grab in the name of resource-based development and disregard of *adivāsis* in contemporary planning practices and legislation amplifies their seclusion from the planning processes that they rightfully need to be involved in. Though such resource-based development trends are prevalent in parts of the world, the Indian context – specifically the *Dongria Kondh*'s strife at Niyamgiri reveals some of the positive initiatives and major disadvantages in Indian legislation at the state and national levels. Their struggle towards obtaining legal entitlement highlights some pertinent learnings. Other international contexts present participatory/community-based planning and conservation initiatives to reinforce the importance of declining top-

down approaches in order to facilitate ecological, socio-cultural and economic justice. These contexts, though very different from the Indian context's fiscal and political scenario, offer insights on imbibing Indigenous people within the system and to allow for a protocol that could develop for improving their participation in planning. Drawing from these perspectives can suggest mechanisms that contribute towards a 'closed loop' of legislation and social norms that can favour the *adivāsis* and perpetuate a new perspective the Indian rural planning framework.

## 2.0 ADIVĀSIS AND THE RURAL PLANNING FRAMEWORK

#### 2.1 The crux of adivāsi life: innate socio-cultural associations with their lands

Spatial and cultural associations of the adivāsis with their natural surroundings continues to reinforce protection of some Indian ecological settings. Their sustainable hunting-gathering practice, shifting cultivation and pastoral activities, and inherent sacred interrelationship with their land helps preserve the ecological environment, and has equally been an important contributor to their livelihood and shelter needs (Intercooperation in India 2007; Oskarsson 2018). Traditional land use management techniques were developed on the basis of a thorough understanding of available natural resources in conjunction with scientific logistics, available land hold size and relation of surrounding land use systems with the concerned area (Joshi 2006). Alternating land-uses such as crop production, forest, grassland, livestock holding, spring sanctuaries, etc. have been managed through traditional agricultural, animal husbandry and forest management practices by the marginal farming communities of Garurganga-Bhetagad in the Central Himalayas (Joshi 2006). Another example are the *Toda* people of the Niligiri Hills in Tamil Nadu who have been inhabiting the forests for centuries whilst making use of forest products, growing subsistence crops, and travelling across grasslands with their herds (Intercooperation in India 2007). Despite the prevalence and use of such knowledge, however, the ecological balance of the Nilgiris is now being affected by factors such as increasing population, evolving land uses and increased tourism - factors which are directly affecting the livelihood and sustenance of many adivāsis around the country. Eastern, north-eastern, central and other southern parts of India are observing similar trends, and it so happens that these regions contribute towards 46% of India's total forest cover (Forest Survey of India 2017).

India's potential to grow as a global economic power led to the arrival of many multi-national companies that unleashed a community engagement strategy which sought to hoodwink many Indigenous communities whilst presenting the companies as large "good-doers" who wish to "improve" and "invest" by offering employment, career opportunities and economic returns within this landscape. The case of Niyamgiri forest hills of Orissa in eastern India is an exemplar of this corporate strategy that has implicated a bauxite-rich geological profile underlain by a healthy ecological order with dense forests, river valleys and vulnerable wildlife species for over two centuries that have been culturally maintained by the *Dongria Kondh* tribe who are the Indigenous people to this landscape of Orissa (Refer Figure 2).

Relatively unaware of the 'power' they possess, this Indigenous community believed that their nation's social and judicial order will support them in their fight towards claiming and protecting the continuity of their traditional lands. Core to the *Dongria Kondh* tribe's belief is their worship of the Mountain God who resides in the Niyamgiri forest hills of Orissa. Their struggle, to affirm their rights over their community–owned land, lasted for over 10 years involving major protests and litigation against a 670,000 km<sup>2</sup>. joint venture between Vedanta Alumina Limited and the Orissa Mining Corporation (OMC) who proposed to construct and undertake bauxite refinery processing and extraction mining works proposed on their lands (Chaudhary 2017; Sahu 2008). Their struggle to attain a stand in the Court of Law is explained in the following section in conjunction with the country's planning system.



Figure 2: Location of Niyamgiri, Orissa (Source: www.downtoearth.org.in)

## 2.2 Planning framework in India

At the core, *adivāsi* communities have always functioned as self-governing groups who do not believe in land ownership regimes which were brought in by the British. Prior to colonization, the Indigenous people dwelled in lands that belonged to an unfamiliar frontier. The influence of formalized planning frameworks didn't extend beyond what was 'known' and Indigenous communities continued to govern their lands irrespective of the rulers of the concerned state/province (Bijoy 2003).

A turning point in Indian history was when the Constitution of India was gazetted on 26th January 1950 to pen down laws for the budding Sovereign Democratic Republic. These laws, drafted under British influence, sought to formalise the ideals behind First Nation land ownership through private property norms, profits, and commercialization of natural and agricultural resources (Bhengra, Bijoy & Luithui 1999). Certain legislative measures such as the *Land Acquisition Act 1894* were enforced to allow the Government to obtain land from private individuals in order to 'develop' it for public purposes. Figure 3(a) shows that over 10 million *adivāsis* have been displaced in order to facilitate dam construction, forest-resource procurement, industrial development and designation of land as 'protected areas' under post-colonial prejudices (Bijoy 2003; Ramanathan 2015; Rangarajan & Shahabuddin 2006). Remarkably, statistics from 1980-81 reveal that only 19.9% of these acquired *adivāsi* land holdings are irrigated as compared to 45.9% of the holdings that belong to remaining general population under the interests of legislation such as the *Forest Policy of 1952, Wildlife Protection Act 1972, Forest Conservation Act 1980* (Kapoor 2009; Ramanathan 2015).

In more recent times, this Act was amended as the *Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013* for rehabilitating and resettling displaced individuals. The Act serves as an initiative that, as a starting point, does benefit certain minority groups. Other positive initiatives towards the protection of *adivāsi* land ownership interests include the *Provisions of Panchayat Raj (Extension of Protection to Scheduled Areas) Act 1996* (PESA) which essentially recognises at the rural/regional level that no development can occur on *adivāsi* lands without their approval. It means that the village–level governance body is recognised as a tribal institution of selfgovernance (Ramanathan 2015). Additionally, the *Scheduled Tribes and Other Traditional Forest Dwellers (Forest Rights) Act 2006*, an amendment to the *Forest Act of 1864*, sought to address the mainstream perception of the *adivāsis* as 'destroyers of ecology' by acknowledging them as traditional land owners (Ramanathan 2015).



Figure 3(a): Displacement and use of acquired land holdings.



Figure 3(b): *Adivāsi* land diversion – use of acquired holdings.

These statutes, however, do not provide any framework for protection from eviction. Like most legislation that currently constitutes the Indian legal framework, these laws sought to decide the entities/authorities who govern the fate of the forest rather than protection of the forests themselves (Ramanathan 2015). The meaning of singular "land entitlement" and any accompanying "claim" over such a resource still finds *adivāsis* stumbling into this alien reality that is driven by formalised Western rules which, in many instances, oppose their traditional land law (Chaudhary 2017).

## 2.3 Identifying issues in the rural planning framework

The various Acts that are enlisted are substantively disregarded by private industries, bureaucrats, money lenders, and government officials alike. Issues regarding law enforcement and legislative justice for the *adivāsis* by various governmental frameworks can be traced to colonial assumptions, ambiguities and discrepancies present within planning and legislation. In statutory terms, *adivāsi* rights to the forest are only 'recognized' in text, whereas in reality the true custodians of these resources are undermined and ignored. The mere perception of *adivāsis* as the ones who oppose 'development', 'national progress', and 'ecological preservation' is leading to their discrimination within Indian social and judicial structures. Additionally, most *adivāsis* are vulnerable due to their disenfranchisement within the larger community because they reside in relatively inaccessible areas and are not completely aware of the laws that favour their rights towards their land.

It is for this reason that rapacious multi-national companies, administrative entities, and elite individuals have been blinded by 'national interest' ideals as observed in cases such as that of Niyamgiri, Orissa. Niyamgiri's relevance as an important ecological corridor for elephants and other vulnerable wildlife species that reside in these forests were brought into the picture. For over 200 years, the *Dongria Kondh* people have developed cultural, agricultural, economic and spiritual connections with the Niyamgiri forest in a manner that has now made them inseparable from their homeland (Sahu 2008). The Indian Supreme Court's judgement in 2006 asked the Central Government's Ministry of Environment and Forests (MOEF) to conduct further studies on the potential impact of mining activities on the region's water and wildlife resources. In 2009, the MOEF declared that mining could occur at the top of Niyamgiri subject to certain safety parameters (CMPDI 2006; Kumar 2014; WII 2006), and granted conditional clearance authority for forest land in the 'name' of 'nation building' activity. In this determination, the lack of acknowledgement of *adivāsi* customary rights in the Central Government's administrative and legal systems was disregarded by their forest and environment officers (Bijoy 2003).

As this debate began to gain political recognition, many activists consulted the Forest Advisory Committee (FAC) seeking leverage through the *Scheduled Tribes and Other Traditional Forest Dwellers (Forest Rights) Act 2006* in order to halt forest clearance citing the failure to obtain permissible rights from the *Dongria Kondh* (Kumar 2014). In 2010 the MOEF cancelled the forest clearance authority and banned all mining activities in the region. Eventually, in 2013, the Supreme Court's landmark judgement over this case led to the empowerment of Niyamgiri's Gram Sabhas (village assemblies) as autonomous entities under the Indian law, whereby any Indian Indigenous community now has the power and responsibility to decide if proposed mining activities violate their religious and forest rights (Kumar 2014).

The triumph of the *Dongrias* serves as a paradigm for the strife of many other Indian *adivāsi* communities who continue to struggle to maintain their traditional land law amidst the formalized ideologies in land entitlement. It should be acknowledged that even though the *Dongria Kondh* eventually received justice, their wait for two decades to receive order that would allow them to enjoy rights over their own holdings caused immense collateral damage to the ecology, community, and their existence. Drawbacks in legal perceptions towards these communities are linked to the underpinnings of the Indian judicial system – an issue that, at the grass roots level, needs to be tackled in order to bring about a healthy change. Their inclusivity would require amendments in planning processes to overcome obstacles.

## 3.0 SUSTAINABLE APPROACHES FOR PARTICIPATORY PLANNING

As identified in the previous sections of this paper, the issues in planning for India's Indigenous groups dwells deep in the Indian socio-political thought and the legislation that has been set out for the country's forestlands. 25% of India's geographic area (3.28 million sq.km.) comprises of forest cover, of which almost 96% falls under state ownership (Agarwala 1985). This is further classified as reserved (52%), protected (31%) and open forest land (31%) [villages, civil, cantonment areas etc.] (Rangan & Lane 2001). As an offshoot of the *National Forest Policy of 1988*, Joint Forestry Management (JFM) became a popular technique for managing forests (Sarin 1995). It was seen as rational approach to ensure that local communities from disadvantaged backgrounds could also participate in gaining benefits from forests by having a steady livelihood and direct access to forest resources to fulfil their socio-economic needs (Rangan & Lane 2001; Sarin 1995). It was also considered to be a de facto rationale for reduce the Central government's control over forests and delegate management responsibilities to various states for bringing as a more efficient mechanism (Bhattacharya, Pradhan & Yadav 2010).

JFM's intentions sought to promote initiatives which share cumulative profits of forest produce between traditional landowners and the government. It began in 1980-86 with preliminary incentives such as tree protection, joint decision-making for tree species selection, planting and maintenance (Government of West Bengal 1996). Within a few years in 1992 this system began to identify economically disadvantaged Indigenous families in order to share the profits of this system when India was beginning to embrace liberalisation and privatisation policies. Commencing with a share of 25% and with negotiations for upto 50% stake in new forest plantations, the West Bengal Forest Department's efforts to improve the economic status of *adivāsis* was seen as one of the first steps towards economic justice (Poffenberger & McGean 1996; Tiwary 1998). In a nutshell, this strategy helped Indigenous communities meet their daily needs whilst balancing the need for forest resources.

Joint Forestry Management finds its roots in a state-based strategy that was initiated to experiment with social forestry policies and to improve the quality of Indian forest management systems when India was embracing liberalisation policies. The absence of formal legislative agreements makes it appear to be a preferred approach since it creates room for collaborative management by state government agencies and diverse cultural groups in the Indian context (Rangan & Lane 2001). However, the drawbacks and malfunction of this system can be traced to dynamic political interfaces and social identities of those who constitute these governing bodies. Inherently the system serves as a medium of "management" as opposed to a participation technique. It relies heavily upon the social perception of *adivāsis* and on the preferences of the elected state government because the process is extremely politicized. Many studies in 1995 and 1997 were carried out to identify its success, and it was understood that a lot many groups have still not been able to attain livelihood objectives that were set out by this system (Sundar, Jeffery & Thin 2001). The JFM's target-driven and incentive-based approach of obtaining economically valued forestry products through the involvement of major stakeholders with agenda-driven state governments facilitates a top-down approach like many other developmental activities that were initiated in the last decade of the 20th century in India (Sundar, Jeffery & Thin 2001). The case of Niyamgiri, as explained earlier, illustrates a parody of "benefit provision" that is orchestrated by this technique. It negotiates for the land's benefits whilst promising adivāsis an economically stable lifestyle, in trade of their land rights and their ability to continue cultural and ecological associations in a fractured landscape.

The balance between environmental, social and cultural justice is hard to achieve in a system that looks at sharing only the economic benefits between a government and its people. However, certain contexts have tried to delve in these approaches for a more equitable outcome. Australia's contractual joint management system for national parks, for example, allows the Aboriginal people unhindered access to their land resources and complete autonomy over their use, which happens to be very limited in terms of its commercial use (Reid et al. 2004). The system focuses on cultural conservation through adoption of non-Western management policies in community-based conservation strategies whilst providing ample opportunities for innovative income generation through increased tourism, employment in management committees, diverse resource use, etc. for provision of an equitable, power-sharing and supportive management system (Reid et al. 2004).

Community-based conservation (CBC) initiatives revert political hierarchy and control to a more equitable stand which takes longer to evolve. Many a time they provide the only solution for balancing biodiversity conservation and poverty alleviation (Brockington 2003; Pimbert 2003). So why are they not in effect when this knowledge has been internationally widespread for over a decade? These initiatives are usually more expensive and involve multiple stakeholders in a comprehensive manner at various stages as compared to standard top-down approaches. Hence, they are less preferred since they limit the government's benefits. If higher income countries were to recognise and acknowledge this system's benefits, they could make this a priority in their political agendas whilst lower income nations could liaise with donors/ stakeholders to facilitate a space for humans in their surrounding ecology (Reid et al. 2004).

Although the Australian context varies immensely from the Indian financial and political system, the approach to alleviate poverty and facilitate ecological sustainability is commendable and worth adopting with some tweaks that would help them establish in the Indian context. The most striking difference between the Australian and Indian context is that the former's overall fiscal and legislative policies favour contractual national parks approach since it is a high income nation with land ownership policies based on the commonwealth system (Rangan & Lane 2001). To engage the *adivāsis* in democratic

policymaking will require greater efforts at the grass roots level to establish a platform that reflects their role in land management systems and the relevance of these techniques in biodiversity sustenance.

The most important aspect of CBC is to acknowledge that ecologically enriched areas are more than biodiversity hubs – they are socio-cultural spaces which have years of traditions associated with them (Pimbert 2003). Certain measures that can be taken to protect nature and renew the place of humans in their ecology lead to strengthening people's local rights, security and ownership of territory. In terms of legislative action, local needs can be considered by categorical classification of protected areas and land-use schemes can be reformed to embody the idea of land ownership rights (Pimbert 2003). The Indian rural planning framework's existence as a colonial legacy emphasises on the Western concept of private and intellectual property rights which do not acknowledge Indigenous management systems for biodiversity sustenance. Over 19% of the Earth's surface are managed and conserved by about 300 million Indigenous people in 4000-5000 different cultures. To provide them sovereign rights over their ancestral lands would not only protect ecology, but would also open up opportunities to share Indigenous knowledge system across the world (Pimbert & Pretty 1997). Active and functional participation of Indigenous groups and professional re-orientation of their role in conservation can have large impacts on their economic well-being, cultural sustenance, and environmental sustainability. Most importantly, new codes for conduct and a significant cultural protocol should be prepared for various external conservation agencies and professionals who wish to associate themselves with the *adivāsis* (Pimbert & Wakeford 2001).

It has also been proven in many other studies that traditional land management practices cater to optimisation of natural resources, and hence prove to be sustainable in the long run. Traditional knowledge considers scientific principles and demonstrates geographic appropriateness with respect to surrounding land-uses. Applying these techniques for the micro plan of villages and subsequently at the regional/rural planning level can have a great impact on the lands owned by the *adivāsis*.

#### **4.0 CONCLUSION**

*Adivāsis* have continued to associate themselves with their lands in an inseparable manner where it has become the medium for their community's sustenance and longevity through socio-cultural and ecological associations. Loss of their traditional lands would mean a bereavement of their identity and traditional ecological knowledge. The introduction of capitalism, land planning, surveying, and the concept of private property/territories has now become the base of contemporary planning practices and legislative policies in the nation. Alien to such concepts, the *adivāsis* find themselves enduring the colonial aftermath as defenceless minority groups who are unaware of the bureaucratic notion of "national development". Mass displacement and loss of ethnic identities has enforced the disruption of interactions between humans and their surrounding ecology. Genetic and cultural intermix of *adivāsi* communities has fed towards the common third-world country crisis of increased unemployment, hunger, poverty, and socio-economic conflicts. Over 90% of India's bio-cultural diversity that was prevalent in precolonial times has been fractured by the dissolution of their traditional land management techniques. Commercialization of forest resources has brought India's Indigenous people down to mere raw material collectors and providers in the current socio-economic ladder as they continue to look for mechanisms to re-build their interrelationships with their lands.

The social perception of *adivāsis* as 'encroachers on ecology' or 'hurdles in reaching resources' rather than true cultural and ecological restorers/custodians has been equally responsible for their disregard in planning processes as seen in cases such as that of Niyamgiri, Orissa. Despite these opinions, the *adivāsis*, India's First Nations people, remain the rightful owners of their homelands who are now facing the risk of erasure of their traditions due to drawbacks in the current legal system and planning approaches.

To rectify these issues, Joint Forestry Management was introduced in late 20th century to improve the economic status of *adivāsis*. Though an earnest attempt, like many other top-down management approaches that exist, this system finds itself lacking in creating better opportunities for the appropriation of autonomous rights of *adivāsis* over their lands due to imposed, target-driven and incentive-based economic strategies. Furthermore, high dependency of this strategy on the everchanging political scenario opens a Pandora's Box of misplaced intentions for their uplift and presents itself as a mere

management measure instead of a holistic approach towards caring for ecology, social and economic justice for these cultural landscapes.

Community-based conservation, therefore, presents itself as an option worth pursuing for decentralising the responsibility of economic and natural resource management. It imbibes participatory planning approaches as a conventional rhetoric to undo conservation ideologies that emerged from colonial thinking by equally involving all contributing members – Indigenous communities, state agencies and external stakeholders. The process begins to unfold with a call for democratic deliberations between the state, concerned Indigenous communities and various organisations such as lawyers, policy-makers, ecologists, planners, economists, etc. to represent an understanding of the local ecology, intellectual property rights, funds, technologies, policies, markets, partnership aspirations, and other traditional ecological knowledge systems (Pimbert 2003). The effectiveness of such initiatives to shift balance of social forces, economic situation and power/political relations can be observed only over time. Sensitising policy makers and professionals is secondary to this wave of change. Invariably, the question that it raises is a matter of preferences that we have as a society – are we more inclined towards a centralised, controlled, and uniform delegation of responsibilities or are we aiming for a more democratic, diverse, and all-inclusive multicultural society that participates all human-ecological disputes for resolution?

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# FROM CAVES TO THE DWELLINGS: A BEAUTIFUL EXPERIENCE IN THE NILGIRIS, SOUTH INDIA

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**Abstract:** Toda is a religion followed by a primitive group of people called Toda who are found in The Nilgiris, Tamilnadu State, South India. It is believed that they existed in the region from the very ancient era. They are the most indigenous group in the locality who live in their beautiful hamlets which are spread in the wild and beautiful forests of The Nilgiris. They have their own customs and beliefs which are very unique when compared to the other religions. Unlike other forest dwellers, Todas are vegetarians and they consider every element of nature, may it be hills, streams, trees, birds, rocks or anything in the surroundings, very divine. Their hamlets consist of dwelling huts not more than 4-5 in number, a buffalo pen and a temple. This paper gives a brief idea about the construction methods of their built structures with elaborate details about the temple form in particular. Certain practices of Toda and their associated belief are explained to highlight the sustainable values which aid them to preserve the nature as an undisturbed habitat. The paper is concluded with suggestions on adopting their built style for various other structures for different uses.

Keywords: Primitive settlements, Toda Community, The Nilgiris, Sustainable Practices.

#### **1.0 INTRODUCTION**

Every religion is bound to follow their codified laws and customs of their own. Toda is no different in this aspect. Toda people have their faith akin to nature. They are vegetarian in food habits. Their main occupation is dairy farming. The buffaloes that the Toda raise are a special category having long horns which are curved inwards as seen in the picture (Figure 1).



Figure 1: A buffalo of Toda

The district called 'The Nilgiris' lies in Tamil Nadu state in South India which spreads across the North latitudes  $11^0$  and  $11^0$  55' and East longitudes  $76^0$  13' and  $77^0$  02' which is eventually a part of the Western Ghats. The prevailing climate of this region is Cold Humid type. The total area of The Nilgiris is 2545 km<sup>2</sup> with a population density of 289 per km<sup>2</sup> (District Census Handbook, The Nilgiris, Census of India 2011: 3). The highest peak in this location is 2595 m above sea level. This is a place of tourism importance due to its long stretch of mountainous area with wide varieties of flora and fauna along with its attractive and pleasing climate. The domestic tourist arrival in the year 2014 was 7622708 in number and foreign tourist arrival in the same year was 176705 in number (Tourism Survey for Tamilnadu 2014: 17-18).

There are more than 75 hamlets of Toda that exist in The Nilgiris (Tarun Chhabra 2015: 58). They are never more than 2000 in number. Their hamlets have very beautiful structures which are known for its architectural splendour (Figure 2). Their hamlets consist of dwelling huts, buffalo pen and sometimes temple/s.



Figure 2: A Toda temple in a Toda hamlet.

The authors make a detailed investigation about the built structures of Toda hamlets with respect to materials, methods of construction, functional adaptability and some of their customs in routine life.

## 2.0 TODA ARCHITECTURE AND SUSTAINABLE PRACTICES

#### a. Customs and Practices of Toda

All the beliefs and practices of Toda show that they preserve nature and their practices in life are centred around conserving The Nilgiris as natural as it was. When a baby is born, they keep the baby always covered and remain inside the hut in the earlier months. Later, depending on the favourable climate, they take out the baby from the room and uncover the eyes to show the scene of rising sun for the first time. This can be marked as a respectable custom.

Most of the hamlets have a temple in the premises where a priest does the rituals using the milk that he takes out from the sacred buffalo which is exclusively raised for prayer purpose. Every day the individuals of the Toda community use dairy products for their food intake. So they raise buffaloes in their hamlet.

Toda never harm any living creature except that they have a ritual of killing a buffalo on anyone's death in the family so that they lay the dead buffalo near the corpse of the dead man due to their belief that the buffalo accompanies the dead to the afterworld.

Toda even have fables associated with many physical features; for example, there are some rocks, the surface of which looks like the scales of the snake. They believe that a buffalo has had a fight with a king cobra which when got killed and split into separate pieces appeared as different rocky mounts. These rock formations have resemblance of its surface with that of snake even today as seen in Figure 3. Due to such strong belief about many other physical features, they never allow anyone to change the natural settings. Another dark coloured rock piece, the sketch of which is given in Figure 4 is called '*corpse stone*'. Its related myth says that a dead body of a female was turned into a stone when the people went to fetch a creeper to perform funerary rites (Tarun Chabra 2015, pp.40-42).



Figure 3 Snake stones



Figure 4 Corpse stone(left), Mythical rocks (right)

Their chants and prayers include verses related to the existing hills, water bodies, valleys, shola thickets, buffaloes, birds, trees, and such. All their rituals have something to do with conserving nature. For example, every Toda clan has their own hill or hillock and sacred water body to perform ceremonies and they possess them as their own. Toda people never impurify these entities of nature. Apart from the hills and streams, they worship even animals such as sambar deer, tiger, snake, etc. The water bodies such as streams, rivers, and lakes in The Nilgiris have its own serenity preserved by them as they consider that these ones exist to enable them to perform various family functions.

They consider that their Gods live in the mountain peaks. They also believe that these are the peaks where the spirits of each one goes after death. There are some 7-10 species of thorny plants which they preserve to grow as they use the pulp of these plants for various rituals connected with pregnancy, ordination rites etc. and also for some other ceremonies at the temples. Toda community now always protests if there is any such move by the Government of India or the states to set up any water reservoir, clearing up the land for plantations etc. which harm the ecosystem.

## b. Food Habits of Toda

Unlike the other indigenous groups, Toda is a vegetarian community whose staple diet is boiled millet in buffalo milk along with ghee and honey. They eat boiled rice as well in the same form. The diet of the priest is rice boiled in buttermilk during the time when ceremonies take place in the temple.

Toda people gather honey abundantly. They produce milk products like ghee, butter and curd out of the milk from the buffaloes they rear. Toda use either bamboo vessels/cans or clay vessels and eat in leaf plates. They also use only wooden spoons. They use bark of *Meliosma* tree to purify the water in streams.



Figure 5: Churning stick (left), Ceropegia flower (right)

They use a handmade stick for churning the curd which is shown in Figure 5. It is made out of Rattan wood and its shape resembles the flower of a plant called *ceropegia*. (Figure 5).

## c. Built Structures of Toda Hamlet

A Toda hamlet consists of dwelling huts (4-5 in number) which are barrel vaulted in shape and a buffalo pen (Figure 6) which is nothing but a circular embankment/compound wall of random rubble stones with a gate facing the temple. The pen is totally open to sky. Most of the hamlets have a temple structure either barrel vaulted shaped or conical one (Figure 7). Individuals of every such hamlet have a water body on their own which is normally the nearest one. The water bodies are preserved for domestic purpose or for personal use of the priest. They smear the premises around the structures in the hamlet with buffalo dung. To clean the inside of the temple, the priest use branches of a tree called '*Pudhoor*' of Sophora Glauca Lesch family.



Figure 6: Buffalo pen facing Temple.



Figure 7: Barrel Vaulted Temple (left), Conical Temple (right)



**Figure 9: Ancient Funeral Sites** 

For funeral sites they construct a circular hedge with random rubble stones as in the sketch shown in Figure 9 (Tarun Chhabra 2015: 1-3). Around the temple they provide granite seating for people to be seated while ceremonies are performed inside the temple. The lamps inside the temple as well as the domestic lamps are lit by using buffalo ghee.

# **3.0 CONSTRUCTION METHODS OF TODA BUILDINGS**

The various construction materials used for the construction of the structures are wooden planks of Rhododentron tree, Granite stones, Rattan wood (a climbing plant), split Rattan peels (for tying), hardwood pieces of Isonandra Perrottetiana (tree around 15m. tall), thick bamboo poles, thin bamboo sticks, thick metal wires (to tie around), grass of species *Eriochrysis Rangacharii* (for thatching the roof – Figure 10), charcoal paste, mud paste, buffalo dung etc.



Figure 10: Eriochrysis Rangacharii – Plant (left), Dried Ones Used in Thatch (right)

The construction methods of the dwelling huts had been explained in detail by the first author in a publication called *'Pristine settlement of Toda at Nilgiris, South India: Design Guidelines'* (Kala C., 2012: 198-203). Nonetheless we would like to add a few missing points about it. The height of the building is slightly inclined towards the rear to a lesser height. The Toda believe that the shape of barrel vault is an inspiration from the shape of a rainbow. But it may also be assumed that due to this shape, elephants may hesitate to attack the structure! The interior of the hut keeps the occupant considerably warm and comfortable in the harsh winter of Ooty, the peakest region in The Nilgiris, which sometimes drops down to even  $0^{0}$ C.

## 3.1. Construction Process of Conical Temple of Toda

The conical Temple of Toda are called '*Poh*' in Toda language. The construction details of the conical temple is explained by Dr. Tarun Chhabra in his book '*Toda Landscape, An Exploration into Ecology*'. (Tarun Chhabra, 2015: 220-245). Now here, we authors have given a complete architectural interpretation to the construction technique of conical shaped Toda temple.

First the circular wall is constructed. The wall masonry consists of thick granite blocks in around 24 vertical lines in a circle of around 4.5 m. diameter. The binding agent used is clayey soil with buffalo dung and other natural materials. The tallest point in the circular outer wall is at the entrance which is around 2.4 m in height and is observed as receding in height towards the rear side. The entrance door is very tiny to fix the door of maximum size 60 cm. x 60 cm. which is mostly placed facing the East side. The wood of this door is made of Rhododendron tree. Only the priest has entry to the temple; he literally crawls inside through this small entrance. Refer Figure 11 for details.



Figure 11: Circular Wall Masonry of Conical Temple

The circular wall is tied around by two rattan hoops which are made by two to three numbers of rattan climbers intertwined with each other and tied together by rattan peels. These hoops go around the circular wall; one, just above the entrance door and the other one near the top edge of the wall. Another set of rattan hoop go around the wall through the inner surface of circular wall as well near the top edge. These two rattan hoops near the top edge, one in the outer and the other in the inner surfaces, are tied to the granite pieces as those are ruptured to have holes in the middle at the top as shown in Figure 12.

The circular plan of the temple is divided into two parts with a bigger area in the front by a vertical wall along a chord parallel to the front side. This vertical wall has a horizontal dimension less than the diameter in plan. This is because the wall is not going through the centre of the circular plan. The material used for this is nothing but thick granite pieces of varying sizes in width as well as height. And this is mainly to form the vaulted shape as shown in the Figure 12. These granite members are fixed on to the ground to have almost 4.5 m. height at the centre from ground level. These are placed at an inclination to the horizontal with a gap in between the members. These are set in position tight because each member is tied to two arcual members made of bunch of rattan wood closely tied by split rattan peels. These arcual members of bunch of rattan wood are there on the front as well as at the back of the vertical wall almost 30 cm. apart. Refer detail (b) in Figure 12. The rattan members for tying with these fresh green arcual rattan hoops which are deeply inserted on to the ground.



Figure 12: Circular and Vertical Wall Masonry of Conical Temple

After that a cross shaped wooden members made of some kind of olive wood are placed on top of the vertical straight wall as shown in Figure 13. The projecting member towards the front is slightly lengthier than the rest. These cross shaped wooden members are fixed to each other at the centre by an iron joint. This is tied to the middle granite vertical wall at detail (a) shown in Figure 13. Also, these cross shaped wooden members are tied along the 4 edges to two circular loops of fresh green rattan climbers, one on top and the other one below as shown in detail (b) in Figure 13.

Next stage is to fit a vertical wooden piece of cross section 20 cm x 10 cm and height around 3.9 m. right at the centre of the cross shaped wooden planks. On top of these another two wooden members of the same olive wood are attached directly above which are equidistant on 4 sides from the centre. Refer detail (c) in Figure 13. These two members are also tied above and below to other sets of circular hoops of intertwined rattan bunches which are smaller in diameter as shown in detail (d) in Figure 13.



Figure 13: Wooden Members on top of Vertical Wall Masonry



Figure 14: Framework of Roof along with Scaffolding

The proceeding stage is to form the frame of the conical roof. For this, long thin bamboo poles are tied around the circular wall as shown in Figure 14. These are tied to the circular rattan hoop on the top outer surface of the circular wall. Alongside a scaffolding of bamboo is also constructed around the structure as shown in Figure 14. These wooden members of the scaffolding are also inclined towards the centre as this will give ease to the people to work on the roof formation. The apex of the roof and the centre of the circular base do not lie on a single vertical line. Instead, the apex of the roof is slightly shifted towards the rear, and it is right above the vertical wall.

After the scaffolding is erected, the workers climb on this and tie the long bamboo poles of the roof frame with the circular hoops on the top and bottom edges of the crisscrossed wooden planks. Similar circular bunch of intertwined rattan hoops, more three in numbers and of reducing diameters, are placed singly inside the roof frame by tying at intervals above as shown in detail (a) in Figure 14. These rattan hoops place the inclined roof frame in position so as to give it conical roof form.

Now loops and loops of thin rattan members are weaved around the roof frame as shown in Figure 15 which are very closely knit till the top. Everywhere split rattan peels are used for tying them tight. After this is done, plentiful bunches of around 30 cm. long grass called Eriochrysis Rangacharii are tied. These bunches are placed close to each other and tied one layer above the other till the top as shown in Figure 16. This forms the thatching of the roof. On the extreme top a stone is placed underneath the grass and tied to secure properly. The structure is made extremely waterproof.



Figure 15: Rattan Weaving around the Framework of Conical Roof

Again, this thatched roof of the completed structure is tied with 8 number of bunches of rattan hoops of varying diameter around it at different vertical heights from the down to top as shown in the photograph Figure 16. These readymade hoops of specific diameter are dropped from the above to fit in at the specific heights.

Around the circular wall, down below, stone members are placed on the plinth to give stability to the wall. All the prayer ceremonies are conducted inside this temple by lighting the lamps with buffalo ghee. This is the only source of light inside the temple. This temple looks more beautiful with the circular compound wall made of random rubble masonry around it.



Figure 16: Conical Temple at Thalpatheri Mund

## 4.0 DESIGN MODIFICATIONS OF THE PROTOTYPES OF TODA BUILDINGS

The construction technique as well as the design of dwelling huts can be suggested for various uses with minor modifications in the design as shown in Figure 17 (a) to (e).

The Figure 17 (a) is to show the design of a playhouse for small kids which can be used in schools, parks etc. In this the door on one side of the wall can be made really big for a grown up person to easily enter. On the other side the doorway can be made little bigger than the original one. This will be a very interesting doorway for small children while playing.

The Figure 17 (b) is a design for a holiday tent which can be built in forests, lakeside etc. The doorway is made big to enter conveniently inside. The design of Figure 17(c) is with doorway made bigger and is there on either side to avail more light inside. This can be used for security cabins in buildings like hostels, apartments etc.

The Figure 17 (d) is a bus shelter design which can be erected on Indian roadside. There are no arcual walls in this as in the case of original one. This is to have a clear view around the premises. One side of the vaulted roof is opened up with archways and gable roof as shown in figure for easy access to the buses. Few bamboo benches can be installed near the other edge facing the road for people to sit.

The Figure 17 (e) is a pavilion with bamboo seating which can be used in parks etc. For last three designs; security cabin, bus shelter and park seating; minimal number of cast iron frames of vaulted shape can be used to give stability to the roof.



Figure 17: Various Design Suggestions for Different Uses

## **5.0 CONCLUSION**

The Toda hamlets are currently a very significant tourist spot in The Nilgiris. This is so because of their unique culture and marvellous architecture. The dwellings of Toda huts are little inconvenient due to its scale for an urban man to adapt. Nonetheless research has to be continued to evolve designs using the sustainable construction techniques of Toda. The existing hamlets of Toda in The Nilgiris have to preserved and the Toda members should be given more grant to maintain their hamlets in proper condition.

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# IMPACT OF SOLID WASTE MANAGEMENT DUE TO URBAN DEVELOPMENT UPON RURAL ENVIRONMENT: JOURNEY FROM ADVERSE TO ADVISABLE IN INDIA

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**Abstract:** Travelling through Indian subcontinent, one can really visualize the difference between rural and urban India, is their standard of living. Many villages are facing impact and challenges of growing number of open landfills, typically found near cities, within rural surroundings, due to urban interference. The present research, study the current scenario of some cities and find out the solution to mitigate problems related to waste disposal. This includes the case study of best practices which have set a different level of milestone altogether and becoming role model for others. The project is heralded as a sustainable model of city republic.

Key Words: Clean water and sanitation, Good health and well-being, waste management

### 1.0 INTRODUCTION

In India approximately 72% of the population lives in the rural area. The soul of India lies in its villages. Away from the din and rush of cities, villages offer a picturesque view of nature and also atmosphere of calm and peace to the senses with pollution-free ambiance. Villages do have a charm of their own.

Rapid urbanisation, changing lifestyles and increasing population has led to a dramatic increase in the quantum of waste generated by various sources. One of the bulk generators of solid waste is the residential or domestic sector. In the existing solid waste management set up in Indian cities, the local government is responsible to collect, treat and dispose off the solid waste in a sustainable manner. However, source segregation process is observed very rare in Indian cities. A large quantity of biodegradable waste finds its way in landfills. Landfills, typically found on the outskirts of cities, are nothing but open dumpsites and are not scientifically managed. Finding space for such dumpsites has become a great challenge, as these dumping grounds are creating numerous environmental, health and social issues for the surrounding hinterlands/villages.

Dumping grounds lead to increased Green House gas emissions, hazardous leachate percolation to groundwater resources and pose a serious threat to human health and environment. There is therefore an urgent need to manage municipal solid waste in a more holistic, integrated, and sustainable manner. Anti-dumping agitations are now seen across many places of country, causing cities to close down their dumping sites.

#### 2.0 RESEARCH CONTEXT

**2.1 Pune (**Maharashtra, India)





Pune city is one of the fastest growing metropolitan cities of India. 'Uruli Devachi' a village beside open dumping ground, where Pune city (Maharashtra) municipal waste is being deposited since 24 years, is facing severe hazardous health repercussions. On an average 1000–1200 mt solid waste is generated per day from the Pune municipal area. This unsegregated solid waste is disposed at a landfill site near Urali-Devachi village. About 43 ha of land have been allocated for solid waste disposal. The site was originally partly stone quarry and had deep excavated areas. Dumping at this site was in progress in full capacity, since the last 10 years, when serious ground water contamination was observed in wells on the downstream slopes up to 2 Km away from site.

Issues Flagged Out of The Study:

- Degradation of underground water and air quality: It has been found that leachates originate from solid waste landfill- contaminated groundwater. Well water found in Urali-Devachi village is not safe for drinking, outdoor bathing, propagation of aquatic life, industrial cooling and for irrigation. The Pune MSW disposal and management practice has led to air pollution and ground aquifer pollution in Urali-Devachi village.
- Land: It has become almost impossible to get land for setting up waste processing and disposal facilities. Site does not carry the capacity to satisfy future requirements of Pune city solid waste requirement. Refer figure 4.
- Centralized vs. decentralized facilities: Location of facilities vs. distance from the points of generation of waste is high, which causes long distance travelling of vehicles.



Figure 2: samples showing poor water quality around dumping site

Recognizing the need for concerted actions to effectively deal with this burning concern, now it is foremost important to come forward to initiate a program aimed at improving solid waste management in the city.

In order to overcome the issues, it is foremost important to look into the effective segregation, defined collection systems and disposal of waste in scientific manner it is the foremost responsibility of citizens to follow the rules, and Government to plan for policies and execute those in effective manner.

Citizens must have to make lot of basic changes in our lifestyle and habits. Right from the household level to city level.

#### 2.2 Ashta (Madhya Pradesh)

The solid waste consists of mainly household waste due to rural nature of the town.

The door-to-door collection facilities in Ashta are literally non-existent. No door-to-door collection system is observed. The solid waste generated in households is disposed by citizens either in open dumps or around waste bins. The lack of awareness combined with lack of infrastructure has led to open dumps in the city. Garbage generated at household is usually dumped on open land or municipal bins. Wherein, collected waste from the city is just dumped weekly. There is no practice of processing of waste in the city. The waste consists of mixture of organic, recyclable and inorganic waste.



Figure 3: Ashta City location in Madhya Pradesh State of India

The images below show open dumps and filthy scenario in the city. Also, all grey water is discharged into open drains which terminate on open plots or in natural drain. In some cases, the black water after being treated through septic tanks is also discharged in the open drains. These drains form a system of storm water and sewerage disposal.



Figure 4: samples showing sewage logging in open plots

As the wastewater is discharged in open drains, which eventually discharge in open plots the wastewater gets logged creating unhygienic conditions. As seen in the section of water quality, this has already led to pollution of the water resources and at certain places near hand pumps and tube wells creates unhygienic conditions.

The above-mentioned examples state typical scenario and some of the bad practices and negative case studies with respect to authors' aim of the research. The further mentioned cases talk about good practices achieved due to progression of Swachh Bharat Mission (Clean India Drive) of India and the society's way of dealing with solid waste management.

## **3.0 GOOD PRACTICES**

## 3.1 Nashik (Maharashtra)

Nasik city was generating about 300 metric tonnes of solid waste per day in year 2006 which has raised to 441 metric tonnes in year 2013. All the solid waste brought from every ward in Nasik is brought at Municipal Solid Waste facility at Pathardi where it is processed there after sorting it. The plant has pre-sorting unit, aerobic compositing unit, leachate treatment plant, Refuse Derives Fuel Plants, Animal Carcass Incinerator, and sanitary landfill etc. To combat this huge amount of solid waste generated, Nasik Municipal Corporation has adopted best way of managing solid waste.



Figure 5: Bell ringing vehicles running through city for waste collection.

Nasik Municipal Corporation has abolished waste bins system and has introduced door to door collection of waste through "Ghantagadis vehicles with the bells from 1996. Total of Ghantagadis more than 120 are on contract which receives waste from householders which is sorted out the recyclable material from it. It is disposed through recycling chain. Nasik Municipal Corporation has established a plant for converting garbage into valuable compost or manure. The collected solid waste is transported to compost plant where it is mechanically segregated and processed to produce fine quality of compost. This project of Municipal Solid Waste Management has made city free from waste bins system.

# 3.2 Panaji (Goa)

Panaji, the capital of Goa, is a city with a strong cultural heritage. According to the 2011 census, the population of Panaji was 114,759, and it is an administrative centre and a commercial hub for the state. Initially Panaji municipal solid waste management system was very poor, with a lack of infrastructure, resulting in unhygienic civic condition. The municipal commissioner initially implemented this project in December 2000 with 70 households. After successful completion of one year the commissioner expanded to another 200 households. After success of this, then commissioner introduced,

- Door to Door Collection (DTDC) in the entire city of Panaji along with the introduction of service charges
- Substitution of community bins by trolley bins along with automated truck loading systems.
- Program for the recycling of plastic waste.

The Panaji module explains how the vision of a city for attaining zero landfilling has been successfully translated into reality by the Corporation of the City of Panaji. The entire city segregates waste into a minimum of 6 fractions. The dry waste is further segregated into 18-20 fractions for recycling; organic waste is composted, and dry waste rejects sent for co-processing among others good practices.

# 3.3 Pimpri-Chinchwad Municipal Corporation (PCMC: Pune, Maharashtra):

In 1993, with the help of a few organized waste pickers and allied groups, over 2000 waste pickers attended a collective meeting to discuss their work conditions and bring light to their struggles. The results led to a collaborative initiative which they named Kagad Kach Patra Kashtakari Panchayat (KKPKP) in the hopes that by working together, they could fight for social justice and improve their economic standing. Through their coordinated efforts, they created the first waste picker's union in India. With this recognition, obtrained in 1996, they were able to obtain identification cards, which laid the groundwork for improving their social status and protecting them from police harassment.



Figure 6: Image showing improved condition of waste collectors

Waste pickers have generally been a group of people at the bottom of the domestic worker hierarchy, frequently mistreated and abused while working under poor physical and social conditions. Source: KKPKP, 2010

One of their greatest achievements was in December 2002 when KKPKP was able to secure medical insurance for its members; the Pune Municipal Corporation (PMC) became the first and only municipality in the country to pay the health insurance premiums from the annual budget for self-employed waste pickers as a gesture of recognition for their financial and environmental contributions to the city.

In 2007, KKPKP created India's first wholly owned waste picker cooperative, Solid Waste Collection and Handling (SWaCH) to standardise collection services and improve members' working conditions.

The co-op is authorised and compensated by the PMC to provide door-to-door waste collection and other waste management services. Currently, with a membership of 2300 waste pickers, the co-op services over 330,000 households in 15 municipal wards of the PMC(Pune municipal corporation) (about 47% of the city) on a contract basis, integrating member waste pickers into the waste collection and disposal system.

In the waste market, this model not only integrates waste workers from the informal into the formal sector, enhancing their social and economic well-being, but also offers cheaper and more recovery-efficient services at a lower environmental cost.

This example is first in its type of articles that discusses community waste initiatives in India.

#### 3.4 Gorai (Mumbai, Maharashtra)

Mumbai is spread over an area of 437.71 sq. km with a population of more than 12 million people generating around 6,500 tons of Municipal Solid Waste (MSW) per day and 2,400 tons of Construction and Demolition Waste per day. The Municipal Corporation of Greater Mumbai (MCGM) showed leadership in addressing the challenge of disposing of Municipal Solid Waste (MSW) within Mumbai City. Municipal Solid Waste (MSW) is openly dumped at disposal sites called Gorai.

The Gorai dumpsite is located in the western suburbs of Mumbai. It spreads over an area of 19.6 ha and is operational since 1972. About 2.34 million tons of waste up to an average height of 26 metre is dumped at the site. Issues flagged due to the previous conditions and Status Before Implementation:

- Frequent burning of garbage lead to excessive air pollution.
- The toxic leachate (the liquid that drains through the garbage) from the waste had led to the degeneration of mangroves in the creek that runs parallel to the dumpsite.
- Unhygienic conditions prevailed and problems faced by neighbourhoods.
- Spreading of diseases like Malaria, Jaundice, Filarial, Chikunguniya and Dysentery in neighbourhoods.
- Bad odour in the nearby areas.



Figure 7: Stage wise development of Gorai Project

Status After Implementation:

- Marked improvement in the quality of life of people in Gorai.
- Property value in the area increased resulting in higher property tax collection for the municipality.

- Improvement in the environment quality is also noticed with elimination of foul odour in the atmosphere after 3 decades.
- Elimination of fire, health hazards and breeding of flies and rodents in the area helps in improved public health and hygiene.
- Noticeable improvement in the quality of creek water due to treatment of leachate and therefore the marine life is noticed.
- Beautified the area with clean and non-polluting air in the zone.

The Gorai module details out the need for scientific closure of a dumpsite by the Municipal Corporation of Greater Mumbai. It captures briefly the technical process involved with a special focus on the community's perspective. The module showcases the overall improvement in the standards of living, local economy, environment, and the biodiversity of the region before and after the scientific closure.

At present there are beautiful green grounds covering an area close to 48 acres in Gorai by the side of a creek overlooking Asia's largest pagoda in the western suburbs of Mumbai.

#### 4.0 SOME SIGNIFICANT EXAMPLES

**Kochi**, (Ernakulam, Kerala) affectionately called the 'Queen of the Arabian Sea', is located on the west coast of India, in the beautiful state of Kerala. This city in the district of Ernakulum can be regarded as the commercial and industrial capital of Kerala. The Kochi module reflects the best practices on source segregation of waste as exemplified by the Kochi Municipal Corporation. The case study shows how source segregation, composting, stringent legal system coupled with multi-stakeholder participation leads to effective waste management in urban places which are devoid of adequate landfill spaces.

**Vijayawada**, (Andhra Peadesh) Municipal Corporation has showcased the simple and effective management of organic waste through decentralised vermicomposting facilities. The module details out the step-by-step guide to vermicomposting technique - its operation, maintenance, pre and post care. It also highlights the positive outcomes of vermicomposting for replication by other urban local bodies.

**Bangalore**, (Karnataka) Bangalore generates around 3000-4000 t/d of USW and a major constituent (72%) of which is organic waste. Today, primary and secondary collection, and transportation have been reasonably satisfactory to enable the city to remain clean. The existing solid waste system in Bangalore city is effective in carrying out the functions of primary collection and transport. However, there has been a significant problem in realizing the large sustainability goals due to the systems heavily relying on centralized waste treatment and disposal system.

It is possible to run decentralized, ward-wise or smaller systems that are more sustainable (economically, environmentally and socially), and overcome some of the lacunae faced in the centralized systems. Decentralized systems of the future can provide greater sustainability but will require a higher level of waste generation and handling discipline.

This article was prepared after a visit to Kerala as a part of an assessment team last year during September after Kerala floods. The author is a development professional and currently working with Oxfam India. One vision, stable leadership, repeated and targeted campaigns for different user groups and continuous innovation to overcome the challenges of new waste streams have helped Panaji achieve this success.

#### 5.0 CONCLUSION

The present study is, therefore intended to study the current scenario of such villages and find out the solution to mitigate problems related to waste disposal. This also includes the case study of the villages which have set a different level of milestone altogether and becoming role model for others. The project is heralded as a sustainable model of a village republic.

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# THE ARCHITECTURE OF ABORIGINAL EARLY LEARNING: A REVIEW OF THREE ABORIGINAL CHILDREN AND FAMILY CENTRES IN RURAL AUSTRALIA

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**Abstract:** A decade ago, the Council of Australian Governments (COAG) prioritised access to early childhood education as a key goal of the 'Closing the Gap' strategy for addressing Indigenous disadvantage. The National Partnership Agreement for Indigenous Early Childhood Development, between the Commonwealth of Australia and the State and Territory Governments invested \$564 million over six years for the establishment of 38 Aboriginal Children and Family Centres across Australia. This paper reviews the design of three Children and Family Centres built in rural Australia; Bubup Wilam Centre for Early Learning (Whittlesea, Victoria), Gabmididi Manoo Children and Family Centre (Whyalla, South Australia) and Ngura Yadurirn Children and Family Centre (Ceduna, South Australia).

In each case study, community consultation and building partnerships with Aboriginal and non-Indigenous stakeholders were integral to the architectural outcomes. The design of each centre is unique, imbuing Indigenous cultural knowledges through design. The design processes for each centre have similarities, in that designers sought to increase congruence between the architecture and users and meet the varying and diverse cultural and socio-spatial needs of each specific group of Aboriginal children and their families. However, the architecture sought to go beyond the mere housing of specific services to also include promoting better health, education and wellbeing for Aboriginal children and their families. This paper examines the design parallels of the three case studies and identifies key architectural elements and features that promote quality and 'best practice' in the design of early learning spaces for Aboriginal children and their families.

**Keywords:** Sustainability, Rural Development, SDGs, Youth Empowerment Indigenous architecture, Design, Aboriginal culture; Early childhood architecture, Indigenous early childhood education, Aboriginal wellbeing.

#### **1.0 INTRODUCTION**

In 2005, the Aboriginal and Torres Strait Islander Social Justice Commissioner called for the governments of Australia to commit to achieving equality for Aboriginal and Torres Strait Islander people in the areas of health and life expectancy within 25 years (Aboriginal and Torres Strait Islander Social Justice Commissioner, 2005). In 2008, Council of Australian Governments initiated a national Indigenous reform agreement (Council of Australian Governments, 2009) with seven targets:

- 1. Close the gap in life expectancy by 2031,
- 2. Halve the gap in child mortality by 2018,
- 3. Ensure 95% of Aboriginal and Torres Strait Islander four-years-olds are enrolled in early childhood education by 2025,
- 4. Halve the gap in reading, writing and numeracy by 2018,
- 5. Halve the gap in year 12 attainment by 2020,
- 6. Halve the gap in employment by 2018, and
- 7. Close the gap in school attendance by 2018 (target added in May 2014) (Department of the Prime Minister and Cabinet, 2018).

Early childhood learning is seen integral to achieving all of the targets. In 2012, the Council of Australian Governments committed AUD\$564.6m over six years to improve Indigenous early childhood learning across Australia. As one of the initiatives, funding was made available to develop Aboriginal Children and Family Centres in various locations across Australia. These were intended to provide a 'one stop shop' to deliver programs and services to address the needs of children and their families from birth to five years of age.

The development of each Aboriginal Children and Family Centres was challenging in terms of existing design knowledge. The Government perceived that the Aboriginal Children and Family Centres should be developed as integrated centres offering care, education, health services, family support and community development activities. Indigenous stakeholders and groups wanted to move beyond the rhetoric of framing the design of Aboriginal early learning environments from a 'deficit' perspective to ensure the design of environments that incorporated Indigenous identity and culture, which could accelerate both learning and well-being outcomes. This paper discusses the development of design of three Children and Family Centres built in rural Australia; Bubup Wilam Centre for Early Learning (Whittlesea, Victoria), Gabmididi Manoo Children and Family Centre (Whyalla, South Australia) and Ngura Yadurirn Children and Family Centre (Ceduna, South Australia) and the manner in which Indigenous identity and culture/s are addressed in their respective designs.

# 2.0 CULTURE AS CENTRAL TO THE DESIGN OF INDIGENOUS EARLY LEARNING CENTRES

Culture is central to feelings of 'being' and 'belonging' and the sense of identity (Martin, 2007; Council of Australian Governments, 2009). Australia has lagged behind other countries in producing frameworks and environments for culturally appropriate early learning. For example, the New Zealand Department of Education laid out frameworks for early learning for Māori children in the 1980s. These stressed three essential components:

- 1. Features in the interests of the child: good-quality services that meets the rights of the child
- 2. Features in the interests of the caregivers accessibility to affordable services
- 3. Features in the interests of cultural survival and transmission to succeeding generations- opportunities for young children and parents to learn their language and culture (Department of Education, 1988 p. 6).

Language nests based on culture and language immersion have been established across Aotearoa New Zealand (Hirsh, 1987) to assist Māori children and their families to develop positive attitudes and values and to be knowledgeable and confident in their Māori identity.

In Australia, work in this area has differed. It is relatively recently that curriculum frameworks for early learning have emphasised cultural identity (see COAG, 2009). The design of early learning centres has been governed by jurisdictional guidelines in each State and Territory. However, the generic and prescriptive nature of such guidelines has not allowed for diversity in design, nor the inclusion of design factors from outside the Anglosphere. This is especially problematic as there are numerous Aboriginal nations in Australia with wide variations in cultures, values, needs and aspirations. As well as contributing to many curricular challenges, such cultural diversity raises issues of how buildings represent Indigenous identities and how architecture may meet such a challenge through design" (Grant and Greenop, 2019 p. 57). Preferred Indigenous learning styles were also considered in the design of each centre so that children could have opportunities to learn through

- (i) observation and imitation,
- (ii) personal trial and error,
- (iii) real life participation rather than practice in artificial settings,
- (iv) learning of context-specific skills rather than general principles and
- (v) person-orientated learning rather than information-orientated learning (Brandl, 1981; Buckley, 1996; Butterworth and Candy, 1998).

It is argued that rather than viewing early childhood learning centres as hubs for services, environments for Aboriginal children should focus on viewing and respecting each child as an individual, and a member of a group with distinct cultural

orientation. The promotion of self-esteem and self-worth through fostering of cultural and learning strengths are integral to this perspective (Martin, 2007; Grant et al., 2011a; 2011b; Kreutz, 2012; Grant et al., 2015). Each of the three centres discussed in this paper is located in a different Indigenous nation with different language/s, cultural practices, expectations and aspirations. Indigenous child rearing practices were also considered as part of the design.

# 2.1 Bubup Wilam Centre for Early Learning

The Bubup Wilam Centre for Early Learning is located in an outer metropolitan suburb of Melbourne, Australia. The brief dictated a durable community building, which would address the standard functional requirements of an early learning and childcare centre, while "...simultaneously responding to the cultural needs of local Aboriginal families and their children" (Kreutz et al. 2018).

The architects used a *parti pris* of identity and belonging, employing the metaphors of "bare feet touching the ground" and a building "grows from the ground" (Bubup Wilam for Early Learning 2016). This is expressed in the building's façade as solid vertical cladding which 'grows' into a bold curved form which clearly defines the building (see fig. 1).



Figure 2: Bubup Wilam Centre for Early Learning-Exterior (Source: Hayball Architects).

Aboriginal identity is central to the design and is expressed through a fusion of architecture and landscape and the merging of outdoor and indoor spaces. The use of earthy ovoid surfaces presents a human scale to the interiors and defines an interior with intimate and group spaces (see fig. 2). Interactive adaptable spaces promote a sense of community and cross-generational inclusiveness with the integration of indoor and outdoor spaces, articulating a strong connectivity between designated child and community spaces, as well as the surrounding landscape. These include the buildings' permeability with the blurring of interior and exterior spaces, the flexibility of space enabled through large sliding walls, the connection to the outdoors is established via large folding windows and the use of windows to avoid an institutional quality.



Figure 3: Bubup Wilam Centre for Early Learning-Foyer (Source: Hayball Architects).

The landscape architects designed multi-functional exterior spaces with natural features to enhance the sense of community and social and environmental connectedness (Bubup Wilam for Early Learning, 2016; Kreutz et al., 2018). Natural elements and features enable children to see the immediate effects of their actions and encourage intergenerational play through natural features and an open free-flowing plan (see fig. 3). A singular outdoor nature play area allows cross-generational inclusiveness, while transparent fencing allows views to the recreation centre, and extends sightlines to the broad context. A strong Aboriginal community-oriented focus is facilitated through shared spaces and gathering places such as the yarning circle, fire pit and stone inscriptions in local Indigenous languages. These design features support an array of community events that involve, but are not limited to smoking ceremonies, dance, painting, and storytelling activities (Kreutz, 2018).



Figure 4: Bubup Wilam Centre for Early Learning-Outside playscape (Source: Hayball Architects).

The building emphasises the significance of spiritual and emotional connections to place, with a sense of Aboriginal community, identity and belonging comes from its functional and experimental qualities. The architecture is enabling, flexible and encourages people to take control and come together to live and celebrate Indigenous culture (Kreutz et al., 2018).

## 3.2 Gabmididi Manoo Children and Family Centre and Ngura Yadurirn Children and Family Centre

The Aboriginal Children and Family Centres at Ceduna and Whyalla, rural towns in South Australia were completed by the same design team, working in close consultation with local stakeholder groups. Both centres are located adjacent to schools with high numbers of Indigenous enrolments. The building requirements and facilities were directed by briefs developed by government, whilst key decisions such as the location and design of building were left to the design team working closely with local stakeholder groups. Specialist consultants were employed to work with communities to provide evidence-based research on Indigenous cultures, languages, oral histories, Indigenous knowledges of the areas, educational, health, disability and social requirements of the children and their families, and the community at large. This material was presented to the individual stakeholder groups who each set a vision for the centre. Interestingly in each project, the stakeholder groups envisaged each centre as community hubs and culturally safe Indigenous 'places' where Aboriginal people were empowered.

In contrast to the design of Bubup Wilam Centre for Early Learning, the architects used curvilinear forms and nonorthogonal geometries using design features which are widely accepted as 'Aboriginal architecture' in Australia (Grant and Greenop, 2018 p. 64) and made notable in examples such as Brambuk Living Cultural Centre (Halls Gap, Victoria) and *Uluru-Kata Tjuta* Cultural Centre (*Uluru* Northern Territory). Layered onto this is the use of corrugated iron, a material frequently used in the design of Indigenous cultural centres and keeping houses. Both buildings are steel framed structures externally clad in a combination of rendered and painted lightweight masonry wall panels and corrugated iron. Similarly, the interiors are fitted with natural materials with colour palettes to reflect each of the local environments Internal linings are a combination of painted plasterboard and stained plywood panelling. The layout of each centre has the preschool and

children's areas housed on the one side of the building with long range views to the adjacent school. The children's areas are housed in a circular room, designed as a cylinder to break down the straight lines and introduce organic forms. Sensitively designed with state-of-the-art facilities (such as a teaching kitchen, storage and quiet areas and toilets (designed to take consideration of gender sensitivities), the early learning areas are equipped to cater for the health and cultural needs of Aboriginal children and have direct access to playscapes. Each centre also has community rooms in separate wings of the building. These areas are flexible and can be divided into several areas and are fitted with full kitchens. Cultural areas containing fire pits, stone seating and other features were designed for each centre also.

The form of Gabmididi Manoo Children and Family Centre, located in Whyalla in rural South Australia, was conceived as a rounded, blunt boomerang shaped building, much like a pair of cupped hands, as a metaphor for holding the child and family close (Grant 2011). The internal and external building materials and cladding to be two dimensional and textural to reflect the colours of the earth and the sea around the Whyalla area. The building design, colour palette and landscape include local Indigenous stories and the theme of the 'land meeting the sea'. The gecko as a significant and resilient creature in the Barngarla landscape was chosen as a motif and used throughout the design.



Figure 5: Gabmididi Manoo Children and Family Centre, Whyalla-Plan (Source: Department of Planning, Transport and Infrastructure (South Australia)).


Figure 6: Gabmididi Manoo Children and Family Centre, Whyalla-Exterior- rear of building showing circular space housing children's' early learning area (Photograph: Elizabeth Grant).

The building entrance has an external waiting area leading to a centrally sited reception with the service offices located directly behind it. Depictions of the mythical rainbow serpent run through the building on the floor for way finding. The serpent moves through the building on the floor and then outside, where it transforms into as a seat. The rainbow serpent then runs between occasional care and preschool in the foyer, under the reception desk and remerging outside in the sandpit.



Figure 7: Gabmididi Manoo Children and Family Centre, Whyalla-Exterior-western frontage of building for community use (including fire pit) (Photograph: Elizabeth Grant).

The Ngura Yadurirn Children and Family Centre in Ceduna in rural South Australia is located adjacent to the local area school, childcare centre, and a private residence. The vision for the centre was as a place of belonging, cultural safety, early childhood development excellence, with a strong focus on Aboriginal culture, where all extended family members could feel comfortable and welcome, safe and stimulating environment that promoted diversity, acceptance and intercultural learnings, that laid down strong educational foundations and provided for a smooth transition into school (Grant et al., 2015).

The facility consists of a one single storey building constructed with three functionally distinct areas under the one roof (due to climatic extremes). On entering the building, the locations of the three main functional areas of the centre are visible and readily accessible. A striking feature of the design is a high circular room in which the main indoor preschool activity takes place. The high ceiling of the preschool creates a sense of space and diffuse light, with a series of square windows situated high on the structure, with Aboriginal art motifs illuminated by sunlight. The effect of the cylinder is to counteract the box-like nature of traditional educational spaces, and to create an organic space. The design is intended to promote free choice and flexibility, and to enable a range of separate learning activities to be set up with sufficient uncluttered space for active play, together with smaller spaces set aside for individual and quiet play. It is intended that children move freely and spontaneously from one activity to another. There is a strong sense of connectedness to the outside environment.



Figure 8: Ngura Yadurirn Children and Family Centre, Ceduna-Exterior with view to public entrance (Photograph: Elizabeth Grant).



Figure 9: Ngura Yadurirn Children and Family Centre, Ceduna-Interior of children's area (Photograph: Elizabeth Grant).

There are representations of local Aboriginal culture, artwork and iconic motifs throughout the centre, with an account of the story behind the floor design proudly proclaimed in large text on the wall next to the door to the early learning centre.

Critical to the success of both projects was the notion of the making of Aboriginal 'places', each with its own distinctive Aboriginal identity. Through consultation with communities, the centres have become sites of layered Indigenous meaning, through the use of signs, symbols, colour, and integration with Aboriginal stories. The strong relationships between the internal and external environments and designing to meet the complex socio-spatial and cultural needs of the various Aboriginal users (Grant et al., 2015) were also integral to each design.

## 4.0 CONCLUSIONS

Early childhood education for Indigenous children must take place in appropriately designed environments. It is essential that environments are created where Indigenous children and their families are viewed as assets. Key to design is the recognition of the Indigenous values, cultural practices, cultural and social history and traditions of the Indigenous group or groups that may use the centre.

All three projects are design precedents in both the fields of Indigenous architecture and placemaking and early childhood design where there is a lack of evidence-based research. Learnings from these projects have the capacity to inform future designs.

The acceptance and success of the projects demonstrates the importance of consultation in the early stages of the project, having the community as equal stakeholders and members of the design team. The place-based knowledge of the

stakeholders was critical to siting and orientation of each project. The projects needed to be located in an appropriate location or Indigenous families simply would not use them.

Each community conceptualised their early learning centre as a community centre in the first instance. This is in contrast to the agencies who conceived the projects as 'service hubs.' Integral to quality early childhood learning for the Indigenous groups was the provision culturally safe place for Indigenous children, their families and the Indigenous community at large. Each design provides a sense of place and space, light, peace and sanctuary which facilitates comfort, security and learning.

For each project there was a recognition of Indigenous values, practices, cultural knowledge and traditions must underpin the design process and the design. It was recognised that intergenerational learning through oral tradition was very important. This was encouraged through embedding place-based knowledge into each design with forms and features acting as environmental prompts. Some of the design features relate to ancient stories whilst others, to contemporary life, with layers of complex meanings embodying the visions of the client. The three projects clearly illustrate the importance of recognising architecture and Indigenous cultures are not static, and that Indigeneity manifests itself in design in a varying and evolving manner.

Addressing Indigenous socio-economic disadvantage is crucial in many colonised countries with minority Indigenous populations. Appropriate architecture can assist in in addressing disadvantage in the crucial early years of life. By providing welcoming and culturally appropriate environments, needs of both children and their families can be met. Culture is central to feelings of 'being' and 'belonging' and to identity. If children and families are to feel welcome and develop a positive sense of identity in early childhood settings, designers need to think about how culture is visible in design.

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## ROLE OF COMMUNITY ENGAGEMENT IN SUSTAINABLE DEVELOPMENT IN RURAL BUILT ENVIRONMENT: PERCEPTIONS OF NON-COMMUNITIES

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Abstract: Previous studies highlighted that rural Sustainable Development (SD) should respect existing individual life style, cultural views, values and systems. However, so far, non-communities are often involved in community development projects. Hence, assessing the perspectives of non-communities regarding community engagement in building design/construction in rural for attain true SD is vital. Integral Sustainable Design (ISD) theory used as a basis and eight semi-structured interviews conducted among non-communities in Ampara district in Sri Lanka. Findings disclosed the vitality of engaging communities in rural SD and outcomes would be useful for the policy developers in enacting/amending the policies for rural SD.

Keywords: Community engagement; Design/Construction, Integral Sustainable Design (ISD) theory; Non-communities, Rural built environment; Sustainable Development (SD)

#### **1.0 INTRODUCTION**

Worldwide, the local governments and private organisations are constantly involved in rural development with the basic intention of providing them will all necessary amenities (Kleemier, 2000; Murdoch, 2000). Yet, these rural developments are hardly in line with the concept of sustainability, as the current rural development strategies around the world rarely consider the sustainable principles (Ang, Karunasena, De Silva, and Gunatilake, 2018). However, as per the authors providing rural built environments with sustainability principles is found to be crucial to achieve true rural development, that is producing economically, socially, and environmentally responsible designs and constructions.

According to Ang et al. (2018), to achieve true rural development, rural Sustainable Development (SD) should respect existing individual lifestyle, cultural views, values and systems. Besides, authors insisted that it should be aimed at addressing the common issues (i.e., social, economic, and environmental) faced by rural communities.

Owing to this, adoption of 1) an effective framework like Integral Sustainable Design (ISD) theory (Roetzel, Fuller, and Rajagopalan, 2017); and 2) a participatory approach (i.e., involvement of rural communities in rural SD) (Bell and Wakeford 2008; Tippett, Handley, and Ravetz, 2007) is found to be imperative in sustainable rural development. Amongst these two, the former is crucial to obtain holistic view on all the key aspects (i.e., experiences, behavior, culture, and systems) to be considered in rural SD (Ang et al., 2018; Roetzel et al., 2017), while the latter is important in attaining successful design outcomes that considers end user's values and needs in their local living conditions (Tippett et al., 2007). However, by far rural SD projects are mainly led by the involvement of non-communities (i.e., officials from respective authorities), while in such projects local communities hardly get involved. This appeared to be hindering the achievement of true rural development, as has been highlighted by Tippett et al. (2007). As non-communities have sufficient experience

in execution of rural SD projects, this paper is aimed at assessing the perspectives of non-communities with respect to role of community engagement in rural SD.

The paper first presents the literature review on SD in rural built environment. Then the research methods adopted with brief introduction to Integral Sustainable Design (ISD) theory. Subsequently, key research findings are presented, and conclusions are drawn.

## 2.0 SUSTAINABLE DEVELOPMENT (SD) IN RURAL BUILT ENVIRONMENT

In general, SD is all about carefully utilizing the available resources while preserving them for future generations (United Nations World Commission on Environment and Development [UN-WCED], 1987). However, within the context of rural areas, SD is a broader concept focused on many contextual aspects as shown in Figure 1.



Figure 1: Key Objectives of Rural SD: Literature Review Findings.

Within the rural context, at the very basic level SD should be aimed fulfilling the basic needs of the community by providing required infrastructure, health care and common amenities (Kleemeier, 2000; Murdoch, 2000; United Nations, 2015). However, from a broader perspective Belyaeva et al. (2016) had disclosed that rural SD is not merely about the effective utilization of available resources and preserving them for future generation, but also aimed at, providing welfare for its people; enabling self-development; protecting cultural values and behaviours; and preserving the resources for reproduction and long term usage for its economic activities such as manufacturing, trades, crafts, agriculture, recreation, tourism, and other important areas. Hence, to achieve rural SD, social, environmental, and economic aspects of the areas to be addressed (Ang et al., 2018). This appear to be in line with the findings of Ali and Nsairat (2009), who had disclosed that the sustainable policies pertinent to rural built environment should hold environmental responsibility, economic profitability, and social awareness.

Additionally, it was ascertained that the rural development should also aimed at addressing common rural issues (Ang et al., 2018). However, the current rural development strategies around the world rarely consider the sustainable principles, eventually having significant impact in attaining rural SD (Kishnani, 2012; Ang et al., 2018). Besides, through the review of literature it was ascertained that non-involvement of communities in rural development projects restraining the proper capturing of end user's values and needs in their local living conditions (Tippett et al., 2007), and thus act as a hindrance for rural SD.

# 3.0 RESEARCH METHODS

When dealing with nature and adhering to SD, multiple perspectives to be addressed (Roetzel et al., 2017). This is indeed true in the context of rural SD (United Nations, 2015). Hence, it is crucial to adopt an effective framework to successfully achieve true rural SD. Integral Theory offers such as a transdisciplinary, systems thinking framework by integrating disciplines or approaches into a larger holistic picture. DeKay and Guzowski (2006) disclosed that the Integral Theory is ideally suited to participatory design for at its core is the notion that designing for sustainability should be heavily informed by the values and needs of end users. As per the Roetzel et al., (2017) ISD theory consist of 4 main quadrants wherein each quadrant has four levels representing in total 16 different levels of perspectives that are to be considered during sustainable design and construction. Thus, it can be posited that the adoption of ISD theory is ideally suited for co-creation in rural contexts and offers a holistic lens into understanding rural sustainability.

Accordingly, the perception of non-communities regarding community engagement in rural SD, at first based on ISD theory, two key research questions were formulated (refer Figure 2). Further few sub research questions are formulated with the intention of encouraging the respondents to share their views and opinions on the various aspects as follows:

- 1. Policies/opportunities for engaging community in design/construction.
- 2. Vitality of engaging community people in design/construction.
- 3. Influence of community livelihood/ lifestyles/ cultures in design/construction.
- 4. Challenges involved in engaging community in design/construction; and
- 5. Strategies for engaging communities in design/construction.

	Subjective	Objective	
Individual	Perspective of Experience	Perspective of Behaviours / Performance How community engagement process can improve in design/construction in rural?	
Collective	Perspective of Cultures	Perspective of Systems / Context What configurations of buildings best integrate with the patterns of the built and natural contexts of rural community?	

#### Figure 2: Key Research Questions Formulated based on ISD Theory.

"Building Ampara" project, Sri Lanka, laid the foundation for selection of rural area for this study. "Building Ampara" was initiated by the iDiDe (Intercultural Dialogue Through Design) program of Deakin University, Australia which delivered a preparatory design project involving academics and architecture students working with rural communities (Ang, 2017). In Ampara district, the focus was limited to two (2) villages naming Akkaraipattu and Addalaichenai, by considering the level of development of different villages in the district and their diverse ethnic cultures and livelihoods. Altogether eight (8) semi-structured interviews were conducted among the professionals involved in the community development projects in Ampara district, specifically in these two villages. Table 1 presents the details of the respondents.

Respondent code	Designation	Years of experience
R1	Secretary, Pradeshiya Sabha (Divisional Council) - Addalaichenai	25-30
R2	Technical Officer, Pradeshiya Sabha (Divisional Council) - Addalaichenai	15-20
R3	Retired Engineer, Building Department	40-45
R4	Technical Officer (Belongs to a local contractor)	15-20
R5	Chief Engineer, Road Development Authority, Akkaraipattu	15-20
R6	Managing Director (Belongs to a contracting firm)	25-30
R7	Technical Officer, Pradeshiya Sabha (Divisional Council) - Akkaraipattu	20-25
R8	Quantity Surveyor, CECB - Ampara	5-10

The semi-structured interviews were recorded with respondents' permission, as it is found to be useful in accessing full record of possibly rich source of data that is discussed within the group, which is not possible in case of notes taking (Dilshad and Latif, 2013). During data analysis, first the transcribed data were read carefully line by line, and the data were divided into meaningful analytical units, and then coded. To facilitate the data analysis process, the study made use of NVivo computer software.

#### 4.0 RESEARCH FINDINGS AND DISCUSSION

The key findings derived through semi-structured interviews with the non-community people, which would ultimately be useful in comprehending the perception of non-communities regarding the engagement of community in rural SD are discussed in the subsequent sections.

#### a. Policies/Opportunities for Engaging Community in Design/Construction

As authors believed that having enacted policies that encourages or mandates the engagement of communities in rural SD would be beneficial in obtaining their participation rural development projects, during the interview this was perceived as a key aspect to be questioned.

Out of the eight (8) respondents, only five (5) had made evident that in the local context there are some policies and opportunities in practice to ensure the engagement of community in design/construction. For instance, respondents R1 and R3 had divulged that in country's recent housing schemes there are certain requirements that insist the active involvement of local community during design/construction of rural development projects. Respondent R2 had further explained this by mentioning that "during the road constructions, it is must for the people who benefits from 'Samurdhi' programme (i.e. poverty alleviation programme conducted by the Government) to get involved in the construction to reduce the labour cost associated with community development, specifically Government funded projects". According to respondent R5, the key intention behind this was to effectively tackle labour unavailability in rural areas as highlighted by Green (2014). He further elaborated that "even during the design/construction of private buildings (i.e. for their individual usage) like houses, the government expect the particular individual to get involved and give the support for the construction, if the particular individual to get involved and give the support for the construction, if the particular individual had obtained financial assistance for the construction of their own houses".

However, the respondents R6 and R8 had disclosed about the non-existence of such policies/opportunities. Conversely, R4 has mentioned that '*I have no much idea about policies/opportunities for engaging community*'. Reasonable supposition for not having sufficient knowledge on policies/opportunities for engaging community in design/construction by these 3 respondents might be due to their lack of dealings with policy and procedural aspects. This makes it vivid that in Ampara District, among the non-community peoples', the ones belong to local authorities tend to have good knowledge and understanding with respect to policies/opportunities for engaging community in rural SD while the others' (i.e. the ones belongs to private sectors) the level of knowledge and awareness with respect to policies/opportunities for engaging community is deemed very low.

#### d. Importance to engage community people in design/construction

Among the key project phases, the authors had devoted their attempts to identify the phases in which the involvement of community was needed to achieved rural SD. As design and construction phases are the crucial phases of a building project which had significant influence on the quality of ultimate project outcome, in this study the focus was limited only to these two phases.

Among the interviewed eight (8) respondents, only three (3) had perceived involvement of community in design phase of the project is important while the others insisted that the involvement of community in design phase is not a good tactic to be adopted. Through the analysis, the key reasons based upon which the respondents had highlighted the involvement of community in design phase is 'needed' or 'not needed' are being derived. Conversely, all the eight (8) respondents have insisted the vitality to engage community people in the construction phase of the projects along with some good reasoning for making such declarations. Table 2 respectively presents the non-community's perceptions on the common reasons for supporting or opposing the engagement of community in the design and construction phase of a rural development project.

No.	Do you think it is important to engage community people in	Total	Percentage of		
	design/construction?	number of	response		
		responses	-		
01	Design phase:				
(a)	Yes	3/8	37.50%		
	To identify the real needs and expectations of the community and the real issues that they face	3/8	37.50%		
	To get different design ideas from community peoples based on their knowledge regarding the cultural values and customs	2/8	25.00%		
	To come up with area specific designs		25.00%		
	To come up with the designs based on the real requirement of the community	2/8	25.00%		
	To get different perspectives which might otherwise remain invisible	1/8	12.50%		
	To uplift the confidence level of community	3/8	37.50%		
	To avoid issues that may arise in the future (i.e. negative perception regarding the project among the community)	2/8	25.00%		
	To build trust among community people	1/8	12.50%		
	To complete the project without any delays	1/8	12.50%		
(b)	No	5/8	62.50%		
	Because community people might not be having sufficient knowledge to give design inputs	2/8	25.00%		
	Because it might lead to poor designs	1/8	12.50%		
	Because people are mainly looking on design and aesthetic appearance and not about strength and stability	3/8	37.50%		
02	Construction phase				
(a)	Yes	8/8	100.00%		
	To get over some social issues like unemployment	8/8	100.00%		
	Can improve the rural areas with minimum cost (because community peoples	5/8	62.50%		
	involvement helps to reduce labour cost)				
	To ensure the buy-in of community towards the community development projects	5/8	62.50%		
	To strengthen relationship between community and local authorities	2/8	25.00%		
	To uplift the confidence level of community	3/8	37.50%		
	To avoid issues that may arise in the future (i.e., negative perception regarding the project among the community, project delays)	4/8	50.00%		

#### Table 2: Reasons for Supporting/Opposing the Community Engagement in Design/Construction.

As depicted in Table 2, the respondents who affirmed the involvement of community in design phase of a project (i.e. R3, R5, and R7) had come up with several beneficial aspects that could be attained through such involvement. Primarily, all these three respondents had disclosed that community engagement in design phase would be useful in exactly capturing the real needs and expectations of the community, and the real issues that they face. As the proper capturing of these aspects found to be crucial in achieving true rural SD (Ang et al., 2018), the involvement of community in design phase could be further reinstated. Besides, all three respondents affirmed that involvement of community in design phase helps to gain the buy-in of the community from the project inception itself, which could ultimately uplift the confidence level of community.

As per Ang et al. (2018), cultural values, views and systems should be considered in rural sustainable design. Respondents R3 and R7 had revealed that through community involvement in design phase, such kind of different design ideas representing the local cultural values and customs could be obtained. Similarly, respondents R3 and R7 had disclosed that to come up with area specific designs, and to come up with the designs that reflects the real requirement of the community, the community engagement in design phase is of paramount importance. Supporting to this view, respondent R1 has revealed about the current practice of getting inputs from the community people for community developments in the rural context by stating that *in divisional councils, once in every 5 years we ask people needs, prioritise the needs and take necessary measures to fulfill those needs*.

As has been affirmed by respondent R3, the involvement of community in design phase is found to be crucial to get different perspectives which might otherwise remain invisible, and to avoid negative perception regarding the project among the community. Only respondent R3 found to be supporting these reasons which might be owing to his sufficient experience in rural community development projects. Equally, it was ascertained through the analysis that by engaging community in design phase, it would be possible to build trust among community people, as well as to complete the project without any delays.

Conversely, the respondents who opposed the need of engaging community in design phase had relied upon certain facts to support their perception (refer Table 2). Respondent R6 had disclosed that involvement of community in design phase might result in poor project designs, owing to the community people's lack of knowledge to give proper design inputs. Hence, he argued that the involvement of community in design phase should be avoided. The respondents R1 and R2 had highlighted the same by relying upon the community peoples' tendency towards looking on design and aesthetic appearance of a project rather about strength and stability which is not of course a good practice to be adopted to ensure proper project outcome. As a way of overcoming these drawbacks associated with community engagement in design phase, respondents R3 and R5 had insisted the necessity of keeping the ultimate decision-making relating to project design with the respective officials, even if the community's inputs are being obtained during the design phase.

Though the respondents had different perspective with respect to community engagement in design phase, they all had similar perception regarding the involvement of community in construction phase (i.e., insisted the vitality to engage community in the construction phase). All the selected respondents had disclosed that involvement of community in construction phase would help to get over unemployment, which is one of the common issues faced by rural communities (Falk, 2001; Green, 2014). The possibility to reduce labour cost associated with the community development project and gaining the buy-in of the community towards such projects are the other benefits stressed by most number of respondents. Similar to previous phase (i.e., design phase), in this phase too (i.e., construction phase) the potential to enhance the confidence level of community and the potential to avoid causation of negative perception regarding the project and project delays, are being ascertained as the benefits that can be gained through community engagement (refer Table 2). In addition, it had been derived through the analysis that through community engagement in construction phase of rural SD projects, the relationship between community and local authorities could also be strengthen. In this phase also, the respondents like R3 and R5 had highlighted the vitality of holding power of making decisions relating to construction with the respective non-community officials to have an optimum project output.

Overall, through the analysis it had been realized that the involvement of communities in both design and construction phases is crucial in rural SD. However, despite their involvement the respective officials must be keen on sustaining the ultimate decision-making relating to design and construction with them.

#### e. Community Livelihood/Lifestyles/Cultures Considered in Design/Construction

Existing literature made evident that in rural SD, sufficient considerations should be given for livelihood, lifestyles, cultural views and values of rural communities (Ang et al., 2018). However, still a question remains as whether such aspects are really considered in rural community development in the local context.

All the respondents of this study, except respondent R4 had divulged that the community's livelihood/lifestyles/cultures are normally considered in community design/construction. As per the respondents, the community buildings are generally intended for the use of community people, thus should be designed in a manner that respect their livelihood/lifestyles/cultures. Respondent R5 had added to this by stating that as the lifestyles of people differs based on the society, geological variations, religions etc., during designing/construction it is crucial to consider the lifestyle of the community.

Though respondent R3 had perceived that the community livelihood/lifestyles/cultures considered in design/construction, he affirmed that these aspects should be considered to some extent. His argument for this affirmation was that "during community development the main focus should be on providing high quality living condition for the rural community and

such developments do not primarily require to respect community livelihood/lifestyles/cultures". He further revealed that whether the community livelihood/lifestyles/cultures to be considered in design/construction is depend on the type and purpose of the building. According to him, during the construction of office building cultural values are not taken into account while in school building constructions the cultural values are considered to some extent. Further, respondent R6 added that since our area is predominantly a Muslim area, most of the community development (i.e. village entrance tower, market building) in the area clearly dictates the dominant religion of the area.

However, respondent R4 had a contradictory perspective. His argument for this was that, due to diversities in livelihoods, lifestyles, and cultures of communities in Ampara District, the livelihood/ lifestyles of community should not be taken into account in design/construction of community development as these are intended for the use of everyone in a community.

## f. Challenges Involved in Engaging Community in Design/Construction

All the interviewed non-community respondents, except respondent R3 had disclosed that in practice they encountered several barriers during the execution of community development project mainly owing to the involvement of community in such projects. Through the analysis five (5) key barriers for engaging community in design/construction are ascertained and they are;

- Lenient construction rules and regulations
- Difficulties in getting permissions from relevant authorities like Municipal council for community involvement
- Misunderstanding between non-community and community participants regarding project designs
- Disagreements among the people due to their differing perceptions on design, which might lead to disputes
- Reluctance of people against certain designs

The 'lenient construction rules and regulations' was identified as key barrier for the effective engagement of community in rural SD projects. According to respondents R1 and R5, though in the local context some policies and opportunities are in practice to ensure the engagement of community in design/construction of rural development projects, still the level of engagement of community in such projects are not that satisfactory due the lenience of the existing policies. Respondent further added to this by stating that "*if effective engagement of community in rural SD projects should be promoted, strict rules should be enacted wherein community involvement in such projects should be mandated*".

Besides, few respondents belong to local authorities (i.e., R1, R2, R5, R7) had disclosed that obtaining relevant permissions from Municipal council for the engagement of community in design/construction itself is a big barrier. Supporting this view, respondent R2 had specified that "though certain local policies promotes the involvement of community in rural SD projects, it is still difficult to get permission from relevant authorities like Municipal council for certain projects that anticipates involving local community in such projects which was mainly owing to the respective authorities concern towards the quality of the final project output".

Review of literature disclosed that mutual understanding between the designer and the community is essential in rural SD projects (Ang et al., 2018). However, the respondents revealed that the different perspectives regarding project designs among non-communities and community had resulted in causing unwanted issues throughout the project. Besides this, respondent R2 had disclosed that due to differing perceptions on designs, disagreement and misunderstanding were erupted among the community participants it-self. Supporting to this view, both respondents R2 and R7 had mentioned that *owing to these different perceptions in most of our previous projects the people attempted to show their unwillingness against certain designs.* Through the discussion with non-communities, it had been ascertained that all these barriers had resulted in causing several disputes throughout the project, which ultimately resulted in causing project delays.

Contradicting with rest of the respondents, respondent R3 had a viewpoint that the there are no any barriers/challenges in engaging community in design/construction. According to him, this was due to the Government prevailing procedures for design/construction of community building. As explained, Building Department (Authority responsible for design /construction) must award the contracts for the community development projects only for CIDA (Construction Industry Development Authority) registered contractors to maintain the quality standard. Thus, even if the community peoples are

engaged in design/construction, they used to perform their roles to an expected standard based on their experience and expertise.

#### g. Strategies for Engaging Community in Design/Construction

These interviewed respondents have come up with a list of measures (i.e., strategies) to be taken to ensure the effective engagement of community in design/construction, which has so far not been disclosed in existing literature. Figure 3 presents these identified twelve (12) key strategies for engaging community in design/construction.



#### Figure 3: Strategies for Engaging Community in Design/Construction.

Through analysis it was found that 'predetermination of the parties to be involved in the community development projects' would be useful in ensuring that all the required human resources (i.e., designers, engineers, contractors, labourers, community, etc.) to successfully execute the project from inception to completion are adequately employed in the project. Besides, the analysis disclosed several strategies could be adopted to ensure the effective engagement of community in rural SD projects as well as to avoid misunderstandings, disagreements, and disputes among the community participants or in between community participants and other project stakeholders. Such strategies are:

- Make the community people clearly understand the reason for engaging them in design/construction
- Give the community people specific roles in the project with clear instructions
- Decide the suitable level of participation for the community in the design/ construction
- Involve some representatives from the community during decision-making
- Authorities should establish certain control over the involved community people
- Give the community an ownership in community development projects
- Appreciate the efforts of the community and their input time to time

Respondent R5 had disclosed that when deciding the suitable level of participation for the community in the design/ construction, it is crucial to decide whether the community are just being informed of the projects and asked for their inputs time to time or whether do they have decision-making power as well.

Conversely, the findings disclosed that by 'establishing good relationships and mutual understanding between community people and non-community people' and by 'determining and establish a proper medium to get feedbacks from the

community time to time' barriers like the reluctance of people against certain designs could be avoided. Besides, respondent R7 had highlighted that 'the representatives from relevant authorities should spend time to talk with community people at the beginning of the project' with the intention of getting a clear idea on community's needs and expectations. Respondent R5 further elaborated this by stating that, after getting a good understanding on community needs and expectations, it is crucial to analyse them in terms of their feasibility and viability, along with keeping the needs and expectation of the people in mind and should make the realistic decisions relating to design/ construction properly. This appears to be in line with the assertion of respondent R5 who had disclosed that, "to get a good output which would be of use for the community, the authorized officials should have certain controls over the design and construction, even if the community people are involved in design or construction". In addition to these measures, respondents R1 and R7 had specified that it would be easy to engage community in design/ construction, if the lifestyle of the community get changed.

#### 5.0 CONCLUSIONS

Findings insisted the vitality of engaging communities in rural SD (i.e., both in design and construction phases), while highlighting the necessity of keeping the ultimate decision-making relating to design and construction with the respective officials to have an optimum project output (refer Section 5.2). Though as per the previous research, community livelihoods, lifestyles, and cultures are to be considered in rural SD, the outcome of this study highlighted that the need of considering these aspects tend to differ depending on the type and purpose of the building. Besides, this study had made a valuable contribution by identifying 12 key strategies that would be useful in ensuring the effective engagement of community in rural SD. Among these strategies, it was ascertained that the effective engagement of community members; establishing good relationships and mutual understanding between community and non-community participants (i.e. designers, contractors, labourers etc.); determining and establishing a regular feedback mechanism between community and non-community participants; and by appreciating the timely efforts and inputs of the community participants. It is believed that the outcomes of this study would be useful for the policy developers in enacting or amending the policies for rural SD. Equally, the research findings would also be useful for the respective authorities in ensuring the effective engagement of the communities in rural SD. Equally, the research findings would also be useful for the respective authorities in ensuring the effective engagement of the communities in rural SD projects by adopting and employing effective mechanisms.

#### HUMAN ETHICS PROTOCOLS

This research received ethics approval from Deakin University (Ref.No: STEC-05-2018\_ANG)

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# HABITAT WITH PEOPLE – AN INCREMENTAL COMMUNITY DRIVEN APPROACH OF LOW-INCOME HOUSING DESIGN

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**Abstract:** This research aims to develop an effective strategy towards initiation of housing design for the low income group understanding the wider linkage of housing and sustainability addressing socio cultural aspects, aesthetic values and financial viability, optimizing the usage of available resources. This also brings out the facts of how a bottom up approach with the engagement of the community can result in incremental development in housing and living standard enhancing ownership. This research focuses on strategic plan by engaging the community in the process to achieve collective sustainability in the livelihood and housing design.

Keywords: Co-Creation, Community Engagement, Housing Design

# 1.0 INTRODUCTION

Design for the social impact has drawn attention to various ranges of researchers and students interested especially in the disadvantaged community (Smithsonian Institution, 2013). Various strategies have been followed over time designing in the rural community context. Among them, the participatory and bottom-up approach has become the new strategy to achieve maximum efficiency. To bring about innovation within a community-based context, different stakeholder communities often need to be engaged so that they may appropriately take part in the design process. The 'invisible' work of engagement is frequently overlooked, and yet it plays an important, often pivotal role within many design-based research projects (Chamberlain, Crabtree and Davies, 2013).

The design process can be social in that it engages people to think about and design their futures, using their ingenuity and locally available resources (Burkett, 2016). In practice, this kind of co-creation requires all who are involved to develop empathy, to share, and to accept an equal partnership in the creation process (Fleischmann, 2013).

Participatory design and co-creation are typical approaches to collecting indigenous wisdom and creating design solutions with social empathy and inclusion. (Wang, Kinns and Ji, 2016). Co-design is about engaging consumers and users of products and services in the design process, with the idea that this will ultimately lead to improvements and innovation. The first element, 'participatory', seems to be self-explanatory. It has to do with participation, with how stakeholders – especially users, developers, and planners – cooperatively make or adjust systems, technologies, and artifacts in ways that fit more appropriately to the needs of those who are going to use them. Design with users: Here, users are "involved" and "influence" the design process; their main resource is their knowledge of the context together with their vision for the system, and their main skills are cooperative (Barki and Hartwick 1989).

At the design stage of housing, reduction in building operating costs, protection of biodiversity and the surrounding natural habitat which influences the socio-economic activities and human interactions, stakeholders' engagement, and provision of facilities that encourage human interactions were revealed as the essential social-sustainability indicators (Ganiyu, 2016).

This study explicates the role of engagement and its evolution in the project, ranging from negotiating with the community in the design setting, through ethnographic understandings of the site and initial points of stakeholder contact, through to fostering engagement.

# 2.0 RESEARCH CONTEXT AND METHODOLOGY

## 2.1 The Context

In the division, Khulna, a small yet old low-income community was selected as site study and application of the community engagement process. Shatbaria, a settlement started British Rule in 1640s, now of approx 1,70,000 sq ft by the river Nabaganga has an approx population of 150 families with a population of 535, located in Jhenaidah district. This community forms with families of Hindu majority population, who are mostly day-laborers, rickshaw pullers, cobblers, auto-rickshaw drivers and house helpers in the profession.



Figure 1: Map of Bangladesh and Shatbaria





Figure 3: Shatbaria Settlement

The settlement consists of people from different occupations and background making it a diverse one with strong cultural, traditional, and historical background.



Figure 4: Area Distribution and Ratio of Population

## 2.2 Methodology

At the initiative of the research, study data were generated at the Housing Studio of Department of Architecture, Brac University. The whole method of the study was divided into two broader portions: one by the researchers and other by community people itself. Primary data with onsite study and survey of different physical, conventional and unconventional aspects of the settlement was generated. Mapping by the community, questionnaire survey on information such as relationship within the neighborhood and different social and economic aspect and focus group discussion as research methodologies by and with community people were used during the research. The children of the community participated

in drawing their aspiration map. Thus, a healthy engaged mechanism was established among the community people and researchers. In the end, all the generated data and mapping were projected with the community and feedback received.

# 3.0 COMMUNITY ENGAGEMENT IN STRATEGY MAKING

The community engagement strategy is the pattern of activities to work collaboratively with and through groups of people to address issues affecting the social well-being of those people (Fawcett et al., 1995; Scantlebury, 2003). Current research have shown that any program and strategy that is intended for the people must encompass them at all stages of the project or program, from the initiating stage to the stage of implementation and assessment.

A specific set of structures or action plans should be suited to the situation and rely upon community-based decisions. Consensus decision-making can create more effective plans and actions as participation can give some sense of ownership and some degree of control (Alexander et al., 1975; Sanoff, 2000), this process can assist people in realizing their responsibilities and encourage them to act for developing their community.

Engaging the community in the process of designing its locality through proper adaptation of strategies is of utmost importance. To bring about innovation within a community-based context, different stakeholder communities often need to be engaged so that they may appropriately take part in the design process (Akhimien et al., Isiwele et al., 2017). This community engagement is frequently overlooked, and yet it plays a significant, often pivotal role inside many designs-based research ventures. It rotates around negotiations with a series of stakeholder communities in the design setting and ethnographic understandings of the site and community.

This successive engagement can be of various kinds, such as design workshops to collaboratively envision future products and practices; one to one conversation and design dialogues between stakeholders and community people; analysis of scenarios and related tools to include those who will use whatever is being designed; various forms of representations used during the process; and to enable all participants in the design process to examine developing designs and to ground the design conversations.

## 4.0 LOW INCOME GROUP AND INCREMENTAL DEVELOPMENT

Bredenoord, 2010 states that incremental development can be defined as a step-by-step process over time whereby building components are added or altered by building owners as funding, time, or materials become available. While looking at the dilemmas of housing shortages for low-income people, one can find firstly the need for the betterment of living and housing circumstances in the slums, and secondly, they need for preparing new land-for-housing schemes as a result of the expectancies related to the growth of cities, (Bredenoord, J. 2010).

UN-Habitat (2005, p 166) writes that assisted self-help housing is the most affordable and intelligent way of providing sustainable shelter to low-income group of people. As it is based on minimum standards it can be cost reducing. It can be useful because individuals and communities engaged in it acquire valuable skills, and it can be practical because it responds to people's needs and levels of affordability. It can be flexible because dwelling units are often designed to expand over time. This underlines the new attention of UN-Habitat for the significance of assisted self-help housing, which even can be seen as a renaissance of a positive attitude concerning the phenomenon.

## 5.0 RURAL REALITIES

Participatory approaches to design, which emphasize social empathy and inclusion rather than a rigorous design discipline, are often presented as effective methods for connecting disadvantaged communities and collecting indigenous wisdom (Wang et al., Bryan-Kinns et al., & Ji et al., 2016). For example, Bergvall-Kåreborn and Ståhlbröst (2008) categorized the reality of rural dwellings as different participatory relationships in such processes as design *for* users, design *with* users, or design *by* users. In traditional participatory design research and practice, participants who live in the situation would be treated as the *user* (or worker) (Muller, 2002).

Carroll and Rosson (2007) suggested that when people understand the value of their knowledge concerning the requirements and design, they become less intimidated by information technology, and more able to act. From these

challenges, it is clear that promoting and sustaining the participation and engagement of the broad local community becomes a key concern of social design in the rural communities.

## 6.0 LOCAL CHALLENGES FOR SOCIAL DESIGNERS

The social design depicts not only design for social purposes, but also social engagement with approaches to the design process. The complexities of engaging local communities in co-creation mean that social designers must take on multiple roles beyond conventional design. Merkel et al. (2004) noted that "working with community groups expands the role of designers into lurkers, facilitators, consultants, and bards and foregrounds the need to find ways of communicating this role to community groups".

Correspondingly, in many cases, and from our hands-on experience, social design is often seen by local people as just a process of watching bustling outsiders' fieldwork with a few invited local participants—the design process often has no meaning for local people in their cultural frame of reference. Furthermore, local communities want tangible outcomes and implementations before the social designers leave, not only presentations and written documents. It is found that if clear and tangible outcomes are not provided, local people become fatigued and even repelled by several rounds of interviews, pilots, observations, evaluations, and so on.

## 7.0 LOCAL MATERIALS USED IN HOUSING: ISSUES AND CONCERNS

Human settlement problems vary from individual to individual, rural to urban, and from country to country in terms of both quantity and quality. The housing problem of developing countries differs greatly from that experienced in developed economies, and rural and urban housing also exhibit their peculiar characteristics. Several constraints slow down the housing development programs and the development of a sustainable habitat. Lack of effective implementation strategies, inadequate supply of affordable land and infrastructure, and inadequacy of housing finance systems are a few among such constraints. Access to affordable building materials is one of the major limitations of the poor in developing countries to provide adequate housing. Out of the capital cost of building construction, more than fifty percent is incurred on building materials in developing countries. The gap between the rising demand and the stagnating, and in many cases declining, production levels is widening at an alarming rate, leading to the escalation of prices of building materials in many developing countries, seriously affecting the affordability of housing for the vast majority of the population (UNCHS, 1990).

#### 8.0 LOCAL FACTORS STRENGTHENING THE COMMUNITY ENGAGEMENT PROCESS

Community engagement and citizen participation have long been important themes in liberal democratic theory, although managerial versions of liberal democracy have typically been dominant. In the past two decades, however, many countries have seen a shift away from a managerial or top-down approach, towards a revitalized emphasis on building institutional bridges between governmental leaders and citizenry, often termed as community engagement.

Policies and programs which aim to strengthen the engagement, connection, and resilience of local communities have increasingly become a core element in public policy responses to the challenges posed by globalizing social and economic relations.

Community engagement processes enable citizens to identify and agree on community concerns, goals and priority actions are prime indicators of progress.

Ives and Olson (1984) present a set of six categories with increasing degrees of user involvement:

- 1. No involvement. Users are unwilling to or are not invited to participate.
- 2. Symbolic involvement. User input is requested but ignored.
- 3. Involvement by advice. User advice is solicited through interviews or questionnaires.
- 4. Involvement by weak control. Users have "sign-off" responsibility at each phase of the system development process.
- 5. Involvement by doing. Users are seen as design team members or as official "liaison" with the information systems development group.

6. Involvement by strong control. Users may pay directly for new developments out of their budget, or user's overall organizational performance evaluation is dependent on the outcome of the development effort

# 9.0 DESIGN PARADIGM

The challenge was not how to survey or design for or with local communities, but rather how to engage local communities in the design, given the local realities of lack of education, enabling technology, and design awareness. We analyze short-term and long-term co-creation processes and compare different design paradigms. Our paper concludes with a reflection on the impact of our approach for social designers and rural practices and reflects on the shortcomings of our study.

Chesbrough and Appleyard (2007) confirm this with their critical factors related to open approaches:

- 1. how to attract the participation of a broad community of contributors, which is the primary focus of the paper
- 2. how to sustain their participation over time, the strategical approaches.
- 3. how to develop an agenda that creates value for the companies while it harmonizes with the values and needs of the community in general.

Three primary design paradigms were established in the initiate the design process. With the collaboration of these paradigms, the end product led the process to the final design and strategy phase.

## 9.1 Content and Context Oriented study and Survey Process

In this paradigm, students were engaged in physical, social, economical, conventional and unconventional surveys and background of the settlement. With the help of community leaders, physical mapping and information were collected and documented in the form of drawings. The questionnaire survey on different homesteads helped to get data of economical condition along with interrelationship between neighbors, land distribution system, numbers of age group, religion, existing resources, and most important skill and interest. This helps to make strong primary data to be used in the decision making on an efficient approach to the housing design. Such as, the social relationship could be an anchor to develop shared space within the homesteads. Income map might help to understand the capacity of the community people and in which sector they have developed expertise.



Figure 5: Property Map



Figure 6: Relationship Map



Figure 7: Profession and Income Map

Interestingly, this phase identified the community people have additional skills and interests such as fishing, cultivation and handcrafting which can be used in the design process to achieve economic sustainability. Homesteads with different skill sets can use that as a resource in the housing design process.



Figure 8: Cultivation Skill Map



Figure 9: Fishing Skill Map



Figure 10: Handcraft Skill Map

# 9.2 Developing the Community Engagement

In this paradigm, community people were directly engaged in the initial site and housing condition study survey. People generated different maps of their community as they know the most about their settlement and its people. Thus, a fun conversation between them locations whose house is where attracted them to engage in the design process. Diverse, but event-driven process based on public interests and rooted in short-term activities such as a conversation and musical performance at the temple yard, children drawing their aspiration on what do they want to have in their community helped build trust within the social designers and community people as well as making strong bond between different age and income groups.

Participatory experience is not simply a method or set of methodologies, it is a mindset and an attitude about people. It is the belief that all people have something to offer to the design process and that they can be both articulate and creative when given appropriate tools with which to express themselves" (Liz Sanders, Make Tools, 2002).



Figure 10: Mapping by the Community (Source: Author)

The results from the participatory process and participants' feedback are promising; with clear indicators of community engagement and knowledge sharing beyond the design process itself.



Figure 11A: Children's Aspiration Drawings



Figure 11B: Children's Aspiration Drawings

## 9.3 Shared Strategic Approach towards Incremental Development

Different maps, data, aspiration, strength, weakness, and resources were projected and exhibit with the community, where open discussion helped its people to understand their strength and how they can take initiative on their own housing development process. These build a strong bonding and initiated a shared strategical approach for incremental development of the overall situation of the community and housing



Figure 12: Projection and Sharing



Figure 13: Projection and Sharing



Figure 14: People Wring their Skills and Aspiration

# 10.0 DESIGN AND CONSTRUCTION AS AN INTEGRATED SYSTEM WITHIN COMMUNITY

This research identified different aspects of existing housing and construction techniques, which will lead the way to designing the housing units and which materials with structure system the locals are familiar with. Community people identified the available resources and data, developed incremental strategies to develop their own houses into different phases.





SECTION AA



Figure 16: Homestead Study







# 11.0 CONCLUSION

Community Engagement process did not explicitly ask local communities to think about and design their futures (cf. Burkett, 2016), we did draw on local community ingenuity and locally available resources which became a leading point for the sustainable design. In the early stage of co-creation, this approach for long term development might prove an effective approach to sustainable design. Sometimes this community approach may delay the process of design, indirect outputs and open-ended creativity may be controversial for social design and its management, and its effectiveness in

transferring to other communities with cultural differences but they are starting points for developing the methodology of community engagement and housing design in future.

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## IMPORTANCE OF DESIGN GUIDELINES FOR SUSTAINABLE CONSTRUCTION AND COMMUNITY ENGAGEMENT IN COASTAL AREAS OF KARNATAKA, INDIA

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Abstract: Climate change creates a significant risk to settlements in coastal Karnataka, India. By studying and analyzing the current vulnerability and hazard along the coast and by understanding the design and construction of the traditional architecture in this region, several solutions for possible adaptions to settlements are presented that can be considered towards formulating regulations for design and construction along the coastal regions and also address policy change. The goal of this paper is to highlight the importance of creating guidelines for sustainable, passive buildings with engagement of the local community that can address the requirements of climate change adaptation.

Keywords: Climate change; Coastal Karnataka; Community; Sustainability; Siting; Traditional architecture

## 1.0 INTRODUCTION

Coastal Karnataka in India has been seeing a tremendous impact due to Climate change on our daily life and activities of the people. Increasing number of people are becoming aware of these environmental changes and are trying to adapt to these changes and build more sustainably. In 2015, the Sustainable Development Goals (SDG's) were developed and adopted by the United Nation member States. The sustainable development goals provide a shared blueprint for peace and prosperity for people and the planet. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries in a global partnership ('SDGs', 2019).

India has been identified as one amongst the 27 countries which are the most vulnerable to the impacts of global warming related accelerated sea level rise (UNEP, 1989). The state of Karnataka along the southwest coast of India along the Arabian sea is increasingly facing the risks of climate change due to sea level rise, coastal erosion and flooding. Karnataka has a tropical monsoon climate and the main characteristics are high temperatures and humidity. The monsoons are characterised by heavy rains and winds during the Monsoon season. Due to climate change, these characteristics are expected to become more extreme and will result in storms, associated waves and storm surges, tsunamis, river flooding, shoreline erosion and the influx of biohazards. For the coastline 69 kms of coastline of Karnataka is under very high vulnerable category and 80 km of shoreline is under high vulnerable category (Jana & Hegde, 2016). This will have its influences on socio-economic conditions of the community and definitely also on the construction method of dwellings and other structures along the coast. The hazards such as erosion, inundation are increasing the vulnerability of the existing traditional beach houses. In this research, to understand the vulnerability and the impact of the climate

change hazards, a study is conducted on the traditional beach houses and its influences and socio-economic background of the people. After analysing the traditional architecture and climate of this region along with climate vulnerability several proposals for a new construction methods are presented for consideration towards policy making. These solutions and with engagement of the local community can potentially lower the vulnerability of the beach houses in coastal Karnataka. The goal is to create a sustainable, passive house that is resistant to the changing climate and the rough coastal environment.



Figure 1: Damages to Local Houses in in Coastal Karnataka due to sea erosion and extreme weather. Source: (deccanherald, 2018)



Figure 2: Coastal sea erosion near tourism resorts in Coastal Karnataka. Source:(deccanherald, 2018)

#### 2.0 CONTEXT STUDY

#### 2.1 Risks of climate change for Karnataka

Climate change means "a change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer". The greenhouse gases are heating the globe faster than ever before, this results in weather that is often unpredictable (Woodward, 2019). It is widely believed that developing countries such as India will be impacted more severely by climate change than developed countries (BCCI, 2011). India has been identified as one amongst the 27 countries which are the most vulnerable to the impacts of global warming related accelerated sea level rise (UNEP, 1989). The socioeconomic impacts of climate change on coastal zones are primarily studied through sea level rise(Senapati & Gupta, 2014). The coastal area is low lying whereby the sea level rise will have a major effect. The rise of the sea level increases the number of people at risk of coastal flooding and together with this their infrastructure, property etc. Sea level rise shifts the wave action zone to higher elevations due to recession of coast to inland. The direct effect of such recession is submergence of coastal land and events such as flooding. Long-term effects can be increased erosion and salt-water intrusion into the ground water as the coast adjusts to new conditions(Jana & Hegde, 2016). As per the BCCI report, global warming is expected to increase coastal temperatures in Karnataka by 1.8 to 2.2°C. During monsoons from the months of June to August, the rainfall increases significantly in the western part of the State and reaches its maximum over the coastal belt. Coastal Karnataka is also likely to have increased wind speed. This will result in more extreme events such as storms, cyclones etc. This increased wind speed is also contributes to the erosion of the coastline (Nanda, Rath, & Rout, 2010). Coastal erosion is responsible for loss of land, houses, infrastructure etc. and it creates a high risk to human well-being, economic development and ecology. From the coastal vulnerability point of view, areas of coastal erosion are considered to be more vulnerable because of the resultant loss of individual and public property as well as important natural habitats. It also trims down the distance between coastal population and ocean, thereby increasing the risk of exposure of population to coastal hazards.

## 2.2 Topography and landscape

The present study is conducted in coastal Karnataka, a state in Southwest India along the Arabian Sea. Coastal Karnataka stretches over the districts of Udupi, Uttara Kannada and Dakshina Kannada. The length of Karnataka's coast line is about 320 km and about 13 to 32 km wide in north and 50 to 65 km in the south.



Figure 3 (a,b) : Environment of coastal Karnataka

The State has different variations in topography; high mountains, plateaus, residual hills and coastal plains. The coast has also narrow rolling plains, estuaries, creeks, long beaches, plenty of natural inlets coupled with rocky outcrops and the soil is a mixture of laterite rock and clay (Ramachandra, Kamakshi, & Shruthi, 2004). The environment of the coastal area is presented in Figure 3. The entire landscape is undulating broken up by mountains and deep ravines. The degree of steepness or flatness of a coastal region determines the

susceptibility of the coast to inundation by flooding. Coastal areas having gentle slope are considered as highly vulnerable areas and areas of steep slope as areas of low vulnerability. Coastal regions having high elevation will be considered as less vulnerable areas because they provide more resistance for inundation against the rising sea level, tsunami run-up, and storm surge. Those coastal regions having low elevation are considered as highly vulnerable areas. Significant wave height, during the monsoon, has been assessed to be greater than 3m and is normally less than 1.5m during the rest of the year. Karnataka has no major delta formations, shown in Figure 4 (Government of Karnataka, 2010), there are around 26 estuaries with more than 70000 ha water spread area and 8000 ha of brackish water area, making the 3 coastal districts of Karnataka very rich in marine, estuarine and riverine biodiversity. 14 rivers which originate in Western Ghats run westwards and join the Arabian sea. Coastal areas near the river mouths along the study area suffer permanent erosion due to natural shifting and migration of the river mouths.



Figure 4: Top view of a flat region along coastal Karnataka

## 2.3 Socio-economic conditions

Karnataka has a population of 69 million people and is the ninth largest state in India in terms of population ('Population of Karnataka', 2019). The population density is 319 people per km<sup>2</sup>(Senapati & Gupta, 2014). The coastal region has high population density compared to upland areas. The population is increasing, for example from 2001 to 2011 there was a population growth of 15,6%. This has its influences and can be interpreted as a direct erosion-inducing variable because the presence of large number of people near the coast may produce damaging impacts on the coastal area. The state Karnataka enjoys a healthy lifestyle and is considered as one of the developed states of India. About 66 per cent of the total population lives in rural areas and the main source of income is from farming alone(BCCI, 2011).Coastal Karnataka has well-developed social, physical and industrial infrastructure, substantial port infrastructure, a well-developed telecom infrastructure and healthcare facilities (IBEF, 2018). Because of this there was an increase of urbanisation and tourism and this caused significant changes in environmental and physical processes in coastal areas.

According to the coastal regulation zones (CRZ), the coastal area of Karnataka can be split up into 4 zones. These zones are presented in figure 5.


Figure 5: Coastal regulation zones

The first zone is the high tide line (HTL), the beach, where the sea ends, this point is set as zero. From zero to 100m there is the no development zone (NDZ), no buildings can be constructed in this area. From 100m to 200m is classified as an area for the local fishing community and housing for traditional buildings (TB). From 200m to 500m only Ground and first floor construction is permitted. There are no specific design and construction guidelines for building houses in this area to address the increased urbanisation and tourism potential of this region.

# 3.0 TRADITIONAL BEACH HOUSES

## 3.1 Existing construction techniques

Coastal Karnataka has its own specific style and characteristics of traditional houses are often used in more modern and new houses. The traditional architecture is rich in content, they have found the right harmony between the necessities of living, the environment, material resources and usage of space. Contemporary, new constructions can be created based on the ideas of these cultural characteristics which offer continuity and adaptability for sustainable architecture (Antarikananda, Douvlou, & Mccartney, 2006). By adapting the knowledge and skills of the local craftsmen and involving them in the construction process, these characteristics and advantages can be included in the new construction.

The traditional houses of South Costal Karnataka were constructed on stone masonry foundations. The foundations were often treated using natural termite and pest repellents such as neem leaves (*Azadirachta indica*) and animal urine. Often the plinth was raised to prevent the seepage of moisture into the houses. Use of natural pigments for paints such as mixture of castor oil and charcoal would help prevent any damages to the exposed plinth of the building. The walls were constructed using various techniques depending on the economic conditions of the dwellers. Houses of the affluent and the wealthy landed sections of the community were constructed using a framed timber structure and in-filled with rammed earth. The rammed earth would also be treated with natural termite and pest repellents. Also use of masonry blocks derived from local laterite quarries were also a common practice. The attics and the mezzanine floor spaces were constructed with timber frames layered with certain types of medicinal plants and topped with a layer of earth. The timber used for the construction were traditionally wild jack wood (Artocarpus hirsute), teakwood (Tectona grandis), Malabar ironwood (*Hopea parviflora*) etc.



Figures 4, 5, 6, 7: Traditional beach houses

Roofing was done by using thatch over a timber frame or bamboo frame. Certain affluent household also used country tiles or potter tiles for roofing. Good quality clay was available in abundance in the costal districts of Karnataka. The practice of water-logged agriculture for paddy cultivation also led to the use of many clay products. With the advent of terracotta glazed roofing tile manufacturing units along the cost of Karnataka tiles in the 19th century, the use of "Mangalore Pattern Tiles" became more prominent in the region. The region also saw a steady rise in manufacture and export of these high-quality roofing tiles to various parts of the world.

With the rise in the number of extreme weather events in the coastal areas, the traditional structures are facing increasing number of threats. Coastal areas have seen a steady rise in extreme events due to change in the intensity of rainfall leading to flooding, land-slides and inundation. These events can be attributed to climate variability. Assessment of historical rainfall data from the costal districts of Karnataka show a rise in deviation from the mean precipitation trends indicating rise in the events such as flooding and drought (BCCI, May 2011). As per the initial assessment, year to year variability in monsoon show a possibility in the rise of extreme hydrological events affecting the livelihood of coastal communities to a large extent (B. Singh, 2014).

The traditional architecture however is not adapted to climate change related hazards and the structures aren't designed against floods, storms etc and there is a need to include this to make the new construction more resilient. In table 1 below an analysis is done of the typical characteristics and construction techniques of the traditional houses of Karnataka. Also the advantages and disadvantages are listed, this to make a selection of the characteristics to be included towards consideration for policy towards new construction.

Traditional beach houses	Characteristics	Advantages	Disadvantages
Foundation	- Not elevated	- Firm	- No protection against floods
Walls	<ul> <li>Bright coloured</li> <li>Lime wash</li> <li>High density materials</li> </ul>	- Solar reflection	
Roof	<ul> <li>Mangalore tiles</li> <li>Dark coloured</li> <li>Sloping roof</li> <li>High density materials</li> </ul>	- Local product	- Increased heat gain
Openings	<ul><li>small windows</li><li>Internal shading</li></ul>	- Less heat gain	<ul> <li>Little natural light inside</li> <li>Need for artificial light</li> </ul>
Materials	- Local materials	<ul> <li>Ecological</li> <li>Community owns the knowledge</li> </ul>	U
	Table 1: Characteristics o	of traditional beach houses	

By observation, the settlements aren't elevated or build on a platform or piles. Most of the houses observed are single-storey, load-bearing structures. Sometimes there are double-storey buildings, this is so that each level provides a protective layer for the level underneath (Shemirani & Nikghadam, 2013).Next to the main house, there are often smaller buildings situated for ancillary usage. Most of the houses do not include a veranda and include a living room, bedroom (varies from one to three) and kitchen. Shading devices such as overhangs or vertical shadings are not existing. Small windows are included in the beach houses which do not provide a lot of internal natural lighting but that also reduces internal heat gain to some extent. The settlement is scattered and constructed using locally available material by local craftsmen or with local craftsmanship finishes. The houses are traditionally designed with laterite stone and mud for walls, sloping roof with local wood rafters and battens with Mangalore tiles. Local wood for window frames and cement or red oxide for flooring.

# 4.0 NEED FOR COMMUNITY ENGAGEMENT AND NEW DESIGN AND CONSTRUCTION METHODS

As explained before, the identified hazards due to climate change are increasing the vulnerability of the traditional beach houses. This paper is presenting some solutions for a new construction method. These solutions can protect the houses and the local community against these hazards towards sustainable development.

# 4.1 Community engagement

The coastal zones are deeply affected by urbanisation, natural disasters, tourism traffic, unsustainable practices etc. due to which the area's coastline can be impacted significantly. As a solution to this, the communities living around the coastal areas need to accept that a sustainability development plan is required towards conservation of bio-diversity and ecology. This requires that the coastal communities and all stakeholders should engage together to develop solutions which helps in creating a brighter future. When communities come together to discuss problems, perspectives from different generation can be shared across all the communities regarding the ways to work along with the government, private sector, tourism sector and the local partners in improving the coastal areas by providing a boost in the tourism sector, improving livelihoods, while protecting and preserving the bio diversity and ecological balance.

Community engagement can be insightful by making communities aware of various issues they are facing such as;

- Making communities appreciate their natural heritage.
- Improving awareness related to problems from change in climate and unsustainability.
- Exploring issues such as land use, urbanization, income generation, conservation of natural habitat etc.
- Collaboration with different sectors such as Social, Cultural, Economic and Science and Technology.
- Help them generate income from wetlands and other natural heritages.
- Encouraging public participation in environment planning.
- Sharing knowledge regarding current publications, researches and education.
- Design practices involving built and natural environments.

This helps communities to come up with required solutions and helps them understand their responsibilities and their role in the betterment of the coastal zones. They realize the importance of the part played by every sector which majorly depend on each other for striving towards a sustainable growth in the coastal area.

## 4.2 Foundation

Because of the rising sea level that will be causing increased floods and erosion, elevated houses can be constructed with the use of beam foundations piles. Wood piles are the most widely used foundation material for elevating coastal residential structures (FEMA, 2011b). Southern pine and Douglas fir are the principal wood species used in the USA and the choice of material can be considered as per local availability. The piles must be durable to withstand the saltwater intrusion. Wood piles must have sufficient strength and straightness to carry the weight of the structure, withstand pile-driving forces at installation, and resist the wind and wave forces acting on the building. Both round tapered timber piles and square cross-section timber piles can be used. Figure 8 shows an image of the elevated structure that can be used in these areas.



Figure 8: Elevated beach house

## 4.3 Dunes

To protect the building from high winds, floods and salt-water intrusion, sand dunes can be constructed in front of the building, between the house and the sea as shown in figure 9. This work can be done in collaboration with the local community engagement.



Figure 9 (a, b): Protective sand dunes

# 4.4 Roof

It is important that the construction can withstand the loads, both lateral and uplifting loads from for example wind. The connections of the roof must ensure that it has adequate strength to resist both the withdrawal of the nail shank from the roof framing and the sheathing's pulling over the head of the fastener (FEMA, 2011a). Additional strength can be added by using ring shank nails, also called deformed shank nails are typically used where uplift forces are large. Metal connectors between the roof and the wall are typically used where uplift forces are large. Compared to other types of roofs, hip roofs generally perform better in high winds because they have fewer sharp corners and fewer distinctive building geometry changes. Steeply pitched roofs usually perform better than flat roofs. The knowledge of the local community can be used in this part of the construction.

# 4.5 Building materials

The building materials face significant environmental effects, wind-driven saltwater spray can cause corrosion and moisture intrusion, the evaporation of saltwater leaves crystalline salt that retains water and is corrosive etc. Each type of commonly used material (wood, concrete, steel, and masonry) has both characteristics that can be advantageous and that can require special consideration when the materials are used in the coastal environment. A coastal residential structure usually has a combination of these materials. High density materials are often used in hot environments for flooring, walls etc. because a lot of heat energy is required to change the temperature of high density materials like concrete, bricks and tiles which makes it a good insulator. The community with the knowledge to local materials can be involved in the construction process. For making the building more sustainable, environmental friendly materials like straw, mineral wool, bamboo etc. can be used.

# 4.6 Orientation

The long façade of the building will be oriented towards the north-south, this is the case for tropical climate such as India('Nzeb', 2019), the reason for this is that the sun is at its highest at the south direction and in the afternoon at the west direction. Adapting to this orientation, the shading devices for the buildings can be easily incorporated this way. The building should be oriented with its longer axis aligned perpendicular to the prevailing winds to facilitate maximum air-flow and cross ventilation through the building. Buildings can be oriented at an angle between  $0^{\circ}$  to  $30^{\circ}$  with respect to the prevailing wind direction. The climatic chart of Mangalore along coastal Karnataka is shown in Figure 10 for reference.



Figure 10: Wind direction (Source: Climate Consultant)

# 4.7 Cooling systems

Passive cooling techniques should be incorporated in the building design to address thermal comfort and energy usage.

# Cool roof

The best way to minimize heat gain from thermal radiation is to block it with shades or reflect it with reflective coatings or materials back into the atmosphere. The heat gain of the roof constitutes about 70% of the total heat gain (Al-obaidi, Ismail, Malek, & Rahman, 2014b). By providing cool roofs with a high reflectance and light-coloured coating (Shi et al., 2019) the need for cooling energy can be reduced and will mitigate carbon emissions. Appropriate insulation of the roof along with Mangalore tiles can be used. Use of filler slabs can also be an effective option in this region.

## Ventilation

Several techniques and devices can be used for optimal ventilation of the house. The house is located in coastal area, this makes it ideal for natural ventilation shown in figure 11, there will be an optimal usage of the sea breeze effect(García et al., 2019). It works as follows, during the day, land heats up faster, the land's air is heated up by conduction and will rise due to its lower density, by convection it will warm up land's air upper layers. At sea, the heat is much lower at surface level, the air is much denser and will not rise. The air over land escapes the surface and generates a pressure gradient, and at the sea, the lack of rising air creates higher surface pressure relative to the land. Thus, thermal circulation of warm air from the land towards the sea is generated. To compensate the air that escaped from the land, the high pressure colder air from the sea flows towards it. At night, the opposite effect occurs. As land cools faster than sea due to their difference in heat capacities, cool air sinks over the land, while warm air rises over the sea, causing the air to flow from the land to the sea.

In the buildings, the rooms should be arranged in a row and provided with large openings on the opposite exterior walls of to allow cross ventilation.



Figure 11: Natural ventilation

#### Vegetation

To provide more cooling, shading and air flow patterns, vegetation such as trees and shrubs can be used in different ways for energy conservation in buildings. Vegetation reduces direct sun from striking and heating up building surfaces. Vegetation also reduces the heat gain in the surroundings of the buildings by shading the ground, parking lots, pavements, etc, which would otherwise heat up and cause urban heat island effect. Trees with strong roots can be planted around the house and towards the south and the west side of the house to block the hottest afternoon sun and also at other sides to shade the building. Examples of vegetation that can be used are Barringtonia, Gold Mohar, Neem etc. ('Nzeb', 2019). These species are a suggestion for Indian coastline as it is important to use local and adaptive vegetation. Deciduous trees should not be used as shading is required during the whole year because of the strong solar radiation and high temperatures in this area.

## Shading

Windows are one of the most significant elements in a house, they provide interaction with the exterior, they act as openings for daylight penetration and natural ventilation. But they also allow unwanted solar heat gain. This unwanted heat gain is reduced by the usage of internal and external shading. External shading is orientation specific and can be integrated in the building. South-facing windows are the easiest to shade. Overhangs on south-oriented windows and the west-side provide effective shading by blocking summer sun. The number of windows at the east and west side should be minimized since they are harder to shade. Shading is generally not required at the north side, cutting the low evening summer sun can be achieved by vertical shades or internal blinds. Semi-outdoor spaces such as balconies, patios etc. can provide shade and protect interior spaces from overheating and climatic variations. At the same time, they act as wind scoops and provide a private social space. It is important to find the right balance between blocking the sun, prevent heat gains, providing adequate natural daylight and natural ventilation.

## 5.0 CONCLUSION

The traditional architecture in these regions, use a lot of passive design climatic techniques and these should also be used in modern and new constructions. Along with the passive design strategies there is also an immediate need to design for climate change adaptation. The research has identified the coastal hazards and this is going to get more extreme in the future due to climate change. Some new design and construction proposals for coastal dwellings have been proposed to adapt to the changing environment. Adaptations done are by elevating the house and constructing dunes against the floods and storms, increased shading by an overhangs, vertical fins, and vegetation. The study also proposes cool roof and use of optimal orientation and natural ventilation. There are no policies that exist for coastal design and construction in these regions and there is an urgent requirement to address this within the Coastal Regulation Zone (CRZ) guidelines to mitigate climate change and adaption.

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# THE STUDY OF HOUSING PREFERENCES OF THE SELETAR COMMUNITY IN JOHOR BAHRU, MALAYSIA

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Abstract: Johor Bahru, in the state of Johor, is located at the southern tip of Peninsular Malaysia and considered to be one of the most rapidly developing cities in Asia. The land resources of Johor Bahru is financially attractive to both local or foreign investors because of its emergent economic corridor, that is being led by the Iskandar Regional Development Authority (IRDA). The impacts of rapid development in this economic corridor has affected some of its Indigenous community groups, especially the Orang Seletar community. The Orang Seletar people, sea nomads of the Tebrau Strait shores, have been particularly exposed to cultural decay due to the surrounding rapid urbanization. This paper aims to consider the Orang Seletar's culture and housing typology preferences to inform options for their future housing design consideration and to ensure their cultural sustainability. The first objective of the research is to examine culture and daily activities that were and continue to be practiced by the Orang Seletar, who used to live in houseboats and thus integral to their sea nomadic lifestyle. The second objective is to investigate the typology of the housing settlement patterns of the Orang Seletar community, and the third objective is to assess the housing settlement preferences of the Orang Seletar community. This research uses both qualitative and quantitative approaches, where content analysis of literature is utilised to achieve the first objective. Field observation and survey questionnaires techniques were used to achieve the second objective, and a structured interview was carried out to achieve the third objective. Three types of houses were identified in eight selected villages studied including: single storey landed brick houses that are built on the land by government; houses on stilts that are made of timber; and, lastly, raft houses that float on sea and riverine water. Based on this comparative study, it is concluded that the Orang Seletar people preferred to continue to live on raft houses.

Keywords: Seletar community, Sea Nomad, Stilt House, Cultural sustainability

## **1.0 INTRODUCTION**

Orang Seletar or also known as 'Orang Laut' or sea people is the only indigenous community in Peninsular Malaysia who lives by the sea (Ahmad et al., 2012). They are classified as one of the indigenous ethnic groups in Malaysia by the department of Orang Asli Development (JKOA). According to Nobaya Ahmad et al. (2012), the population of Orang Seletar is about 1700 people, residing at about 9 villages along the Johor coastal at Tebrau straits. Based on history, Orang Seletar had played an essential role in the Sultanate of Johor in the 15th century. They were employed as one of defence line from any attack from the sea. Orang Seletar used to live in boats where they conduct their daily activities (Ali, 2002). With the houseboats, they live and sail in mangroves, seashores, and sea environments along the coast of southern Johor and the islands of Singapore (Mariam, 2002). Today, they have abandoned their houseboats nomadic life and living sedentary live along mangrove areas towards the seashore.

This research intends to study the housing preferences of Orang Seletar that reflect the culture of sea people and the sea nomad. There are 3 types of houses that have been identified in Kampung Bakar Batu and Kampung Sungai Temun which represent a significant number of Orang Seletar community. The 3 types of houses mentioned are single-story stone houses which are built in the middle of the land by the government, on stilt houses which are made of timber and lastly floating houses on sea. The boathouse type of housing which they were used to live a long time ago as the sea nomad will be discussed in this research as part of the housing

preferences. A comparatives study is used to compare all types of housing settlements in response to their culture as the sea people.

# 2.0 RESEARCH METHODOLOGY

The research methodology is developed systematically so that the research is carried out smoothly to achieve the best possible result, hence leading to the recommendation of consideration aspects for the future Orang Seletar and their housing settlement. The research utilises mix-methods mode, has both qualitative and quantitative approaches. There are three methods of data collection which are literature review, field observation, and a structured interview. The literature review is to examine the culture of the Seletar Community, Observation is to identify the real condition, characteristics and issues of all housing typologies and lastly structured interviews are to assess the housing typology preferences of the Seletar community.

## 2.1 Literature review:

Literature review is one of the most essential parts of the research; several up to date journals, articles and research are collected and reviewed on the contents and author's opinion to collect data on the culture of Orang Seletar. Data collected from literature review structured and listed out as a guide in the research to achieve the aims and objectives.

As part of the research chronological method, first, a few potential related works of literature are being listed out and studied one by one. Once the general idea or knowledge on the issue had been strengthened, several informative works of literature are shortlisted to be included in the report.

#### 2.2 Field observation:

Field observations conducted by the researcher were to evaluate the condition of every housing typology and the main concern for this study is the physical aspects of every housing typology which assessed based on the housing setting, materials used and the existing facilities. The non-physical aspects such as housing cost and maintenance are also included in the field observation through the interview with Orang Seletar as part of the housing typology characteristic.

The field observation consists of four checklists as follows:

- a) Housing setting types; on the ground, floating, on-stilt and moveable.
- b) Housing components material Housing components; wall, floor, and roof with types of material; concrete, brick, and timber
- c) Existing facilities number of rooms, toilet, and kitchen
- d) Non-physical aspects cost and maintenance

Photos of all housing typologies are taken to support analysis and discussion in Research. Field observation is significant in this study to evaluate the characteristic of every housing typology which will influence Orang Seletar's housing typology preferences.

#### **2.3 Structured interview:**

This study adopted the quantitative method where structured interviews were conducted. The structured interview is selected as the method of research based on several factors. As mentioned by Badruddin (2015), the literacy rate of Orang Asli in Malaysia is at 43% compares to the national literacy rates of 86%. The statement is supported by Amir (2015), where communication is the challenge and limitation in his research. Thus, the structured interview is selected instead of the survey questionnaire due to the literacy rate of the Seletar community. This structured interview aims to comprehend the relationship between the culture and housing settlement typology preferences.

## 3.0 RESEARCH FINDINGS

Housing typologies of Orang Seletar is made based on the literature review and further with field observation and interview. The different village has different housing typologies. Every typology is discussed in the next sections.

# 3.1.1 Landed Houses

Landed houses are low-rise or low-density residential development. Most of the landed housing lives by Orang Seletar are provided by the government through the Orang Asli Department about 20 years ago. The houses have a simple rectangle layout with a double pith roof. The same typical layout can be seen in Kampung Sungai Temun, Kampung Bakar Batu and Kampung Simpang Arang where the dimension of the house is about 8 meters width with 12 meters length. Some of the houses have been undergone several renovations but the majority of them are still in original condition. Figure 3.0 shows the typical layout and elevation of the landed house.



Figure 3.0 shows the typical layout and elevation of the landed house.

Based on the field observation, the houses normally have 2 bedrooms and occupied by more than one family. According to the interview with one villager from Kampung Bakar Batu named Mr Muse, most of Orang Seletar only rely on the houses that have been provided by the government because they could not afford to build their own house. Therefore, the houses that have been given about 15 years ago, is being shared from one generation to another generation. Thus, the 2 bedrooms house is not enough to cater to more than one family. Only a few of them can afford to renovate the house and add more rooms, while others are still depending on the government's assistance.

The wall of the house is made of brick, however, the interior walls that separate between interior spaces are made of timber which is cheaper than brick. Unlike other normal landed houses that are lived by other races or tribes, most of Orang Seletar's houses have very few furniture due to affordability, housing size, and cultural influences. Since one house is being shared with more than one family, most of the designated living room functional as another bedroom for them which indicates inadequate house size. Therefore, furniture such as sofa is rarely seen in the living room instead of a mattress.

Orang Seletar's landed houses neighbourhood culture is quite different from Malay village neighbourhood culture. Most of the landed houses are located next to each other that form a linear neighbourhood. Based on observation and interview at Kampung Sungai Temun, orang Seletar portrayed fewer privacy concerns between their neighbourhood. House door is being open throughout the day and can be entered by any family members, kids or neighbours. Kids are free to play inside any house. The porch in front of the house is used to be a place for gathering and social interaction between neighbours.

Despite living on landed housing, most of Orang Seletar still work as fishermen. Therefore, the location of the house landed houses are not far from the sea. According to Mr Muse, as Orang Laut (sea gipsies), Orang Seletar had a land sickness when they were forced to live on the landed house. Land sickness is known as Mal de Débarquement Syndrome (MdDS) which literally translated as the "sickness of disembarkment." It is a disorder of rocking vertigo and imbalance that starts after a period of motion exposure, such as going on a cruise, flying, or even a long car ride (Yoon-Hee Cha, 2017). Orang Seletar has this syndrome after living on the water for a long period of time. But nowadays, those who live in this typology of houses already adapted to live on land. However, they always wanted to go to the sea and work as fishermen as the sea is always in their heart and blood as explained by Mr Muse. Orang Seletar docks their boats to the nearest seashore from

their houses. The boats were seen to be stranded along the seashore due to improper jetty facility and prone to damage when the northeast monsoon that comes every January to march every year.

## 3.1.2 Stilt Houses

On-stilt houses which may also be referred to as pile dwellings or palafitte are houses raised on piles over the surface of the soil or a body of water. Generally, there is no typical layout for stilt houses for Orang Seletar since they built it on their own. Almost all stilt houses are self-funded and being built by themselves without government assistance. Therefore, the size of the house varies according to their affordability and the number of occupants in the house. The most basic house design has 2 bedrooms and one toilet. However, some of the houses still using a public toilet which is located outside and being shared with multiple houses surrounding the neighbourhood. Therefore, there are two categories of on-stilt houses which are houses with toilet and without a toilet.

The wall of the house is usually made of timber planks and uses zinc for the roof. The wall and floor are made of timber planks that usually being collected from any construction waste area, as shown in Figure 4.6. This will reduce the cost to build or extend the house.

This typology of housing does not have a proper sewerage system where the sewage is being discharged directly into the sea from their toilet as shown in Figure 3. Even though they do not have a proper sewerage system, Orang Seletar in this typology of houses still has access to clean water supply from Jabatan Bekalan Air Johor (JBAJ). For the material, most the toilet floor is made of toilet planks with a wall made of zinc.



Figure 3.1 shows the typical layout and elevation of the stilt house.

Just like landed houses, Orang Seletar shows less interest to equip the house with furniture such as sofa and sleeping bed since it is not the priority for them according to their needs and affordability. Moreover, as mentioned by Mr Ahmad, some of the on-stilt houses are not able to bear and withstands the weight of heavy furniture for a long period.

The size of the houses could be enlarged and expanded in future, according to their needs and affordability. There is no clear boundary between one house to another house, and there is no link that connected between the houses except for the shared toilet. The houses have a significant gap between each other that scattered along the seashore. This is to allow the future extension of the house. According to Mr Ahmad, the house pile usually made of mangroves wood that is taken from mangrove area along the Tebrau straits.

# 3.1.3 Raft Houses

According to C. Moon (2015), Raft house is a floating house on the water, basically buoyant up and down in some degree by itself at a moored place. Based on the interview with Cik Syarifah, a villager from Kampung Sungai Temun, there are several raft houses that Orang Seletar used to live along the Tebrau straits. But due to the high construction cost, very few of them are still stay on this typology of house. The wall and the roof are almost the same as stilt housing where it uses timber planks for walls and zinc for the roof. Timber floor is tide up on top of blue barrels that act as a raft for the house. As stated by Cik Syarifah, the blue barrels are costing about RM300 each and needs maintenance from time to time, therefore most of Orang Seletar cannot afford to build raft houses.

Raft house relatively has smaller size compared to the other two-house typologies due to the higher cost and maintenance. The larger the floor area, the higher the cost and maintenance as explained by Cik Syarifah. Raft house commonly has a single bedroom with a single toilet and living room. Kitchen is located outside of the house as shown in Figure 3.2. Orang Seletar did not familiar with fancy cooking like where they used to cook indifferently with simple way in old time. Cooking is the culture that Orang Seletar learn from Malay when they move the settlement near to the land as said by Cik Syarifah. Therefore, the kitchen is the new space that they add to their house design. Raft houses are the closest resemble the boathouse typology and resemble the culture of sea nomad that Orang Seletar used to live.



Figure 3.2 shows the typical layout and elevation of the raft house.

As explained by Cik Syarifah, raft houses are the typology that she and her family like the most. As a fisherman and mussels' collector, it easier for them to collect or breed mussels on raft houses. The elevation of raft houses is shown in Figure 4.22 below. Despite mussels that grow underneath the house especially at the blue barrels, they can extend the mussels breeding area that can reach more than 100-meter radius from the home. As the Orang Laut (sea gipsies), the raft houses can keep their identity and culture of the sea nomad from time to time. Those Orang Seletar that lives in this typology of houses still practice and preserve most of their culture. As reported by Cik Syarifah, the simple comparison that can be seen is that those kids who live on raft houses can swim and dive compared to some of the kids who live on land. Raft houses has the ability to move from one place to another place. This is crucial when the place that they are used to stay has been planned for urban development. The mobility is found along the Tebrau straits that is near to the 7 prominent villages of Orang Seletar. This mobility ability proves that the nomadic culture of Orang Seletar still exists through the raft houses typology.

# **3.3 Housing Typology Preferences**

Housing preferences for each typology is tested using 7 variables which are for future consideration. i.e. wellbuilt houses, culturally reflective, meeting daily needs, good neighbourhood, feeling safe and adequate house size. The result is shown in Figure 3.4 below.



Figure 3.4 Percentage of housing preferences based on variables

The result for housing preferences for each variable is shown in Table 3.0.

	HOUSIN	G PREFERENCES TYPOLOGY			
VARIABLES	LANDED HOUSES	RAFT HOUSES	ON STILT HOUSES	BOAT HOUSES	
Future consideration	$\checkmark$				
Well-built house			$\checkmark$		
Culturally reflective				$\checkmark$	
Meeting daily needs				~	
Good neighbourhood			~		
Feeling safe	$\checkmark$				
Adequate house size	$\checkmark$		~		

Table 3.0 Variable score for housing preferences typology

Both landed houses and On-stilt houses score 3 out of seven variables. This means Orang Seletar prefer landed houses and on-stilt house over other housing typology generally. Landed houses is preferred as a house for their future consideration, a house that makes them feel safe and has adequate house size, while the on-stilt house is preferred as their consideration if the houses is well built with upgraded facilities, houses that have good neighbourhood and has adequate house size. Next, even though boat houses or known as 'Pauk' has not existed anymore in any Orang Seletar's villages, The boat houses still score two out of seven variables which are culturally reflective and meeting their daily needs. This means boat houses are still relevant for some of them especially for those who still strongly practice sea nomadic culture. Raft houses score none of the variables. This means raft house is the least preferred houses among Orang Seletar. The result can be influenced by the characteristic factors of the raft houses such as safety issue, expensive cost and higher maintenance.

## 4.0 CONCLUSION

In modern days, Orang Seletar must adapt with urbanization surrounding them while sustaining their sea culture tradition with the help of government and relevant authority through new housing settlement scheme. Thus, this study is vital for the authority, developer, and architects to have a better understanding of the culture and housing typology preferences of Orang Seletar.

Landed houses and on-stilt houses are the most preferred housing typology by Orang Seletar. On-Stilt houses has cheaper construction cost for expansion and more flexible compared to Landed houses. The gap between on stilt houses is to ensure that the houses can expand in future. The wall and the floor are made of timber plank that Orang Seletar collected from construction waste. This leads to ugly facade appearance on the wall of the houses architecturally. This is because the current on-stilt housing scheme by Orang Seletar do not have grid structural system that leads to improper house facade. It is proposed that the architect or developer provide and design strong grid structural system for the house. The structural system can be made of timber or steel so that timber planks from construction waste can be fixed nicely on the structural system. There is possibility to explore other waste materials such as plastic bottles or zinc as the housing facade as it has been used in a certain country

One of the cultures of Orang Seletar is that they share one house for few generations in the family. The future house of Orang Seletar should have the ability to expand with a minimum cost of house renovation. As the most preferred housing typology, landed house currently is not flexible for future expansion because the renovation of the house will be so expensive as the walls and floors are made of bricks and concrete. It is recommended that some part of the house is designed for future expansion especially at the bedroom and living room. Besides, the narrow gap between the houses also limits the house expansion. However due to limited reserved land for Orang Seletar, the expansion of the house is suggested to expand vertically, and the expansion should also incur a minimum cost to avoid financial difficulty among the under-privileged group.

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ECONOMIC STUDY OF SELETAR ABORIGINE COMMUNITY AT BAKAR BATU AND SG TEMON JOHO R MALAYSIA

# INFLUENCE OF INTERCULTURAL DIALOGUE THROUGH DESIGN (IDIDE) ON STUDENT LEARNING: ILLUSTRATION THROUGH DESIGN OF ANGANWADI CENTERS DURING IDIDE IN MANIPAL, INDIA

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ABSTRACT: Intercultural Dialogue through Design (iDiDe) is an international design workshop with transcultural themed agenda achieved through immersion of cultural experience and cross-national collaboration. The objectives of iDiDe are to explore contemporary practice within globalized context through dialogue between different cultures and people to contribute to common cause. The collaboration and dialogue are focused upon integrated design for sustainable community development in diverse contexts and socially conscious architectural brief within a two-week intensive studio. This academic experience creates international awareness and fosters intercultural understanding with culturally appropriate design responses. This paper expounds on student learning outcomes from the studios conducted through iDiDe at Manipal, in collaboration with the students of three Universities India, Australia and Malaysia in designing Anganwadi Centres for the rural communities in Ajjarkad and Shirthady, Karnataka, India. Anganwadi is a rural mother and childcare centre started by the Indian government in 1975 as part of the Integrated Child Development Services (ICDS 2017) program to combat hunger and malnutrition in children and pregnant mothers of rural communities. The studios thus organised had a schedule of rigorous tasks, meetings with community, site visits and lectures from academy and industry to equip students to design proposals for Anganwadi Centres alongside other activities of cultural immersion for holistic learning. Hence, over two weeks, students worked in teams of five, under academic mentorship, to reconcile and reflect upon diverse cultural frameworks and negotiated dialogue through engagement with local community stakeholders. The activities and students' experiences during iDiDe have been documented and analysed for associating with learning outcomes with respect to sustainability, built environment, culture, community engagement, personal and interpersonal skills etc. In conclusion, iDiDe transforms students across the world into young designers and prepares them for international market with skills not only for design, but also for intercultural communication and distributed collaboration

Keywords: learning outcomes, intercultural, collaboration, dialogue, community engagement.

## 1.0 INTRODUCTION

International Dialogue through Design, globally known as "iDiDe", is an intercultural collaborative platform that carries the vision to infuse future architects and built environment professionals with the essential skillset of a global citizen, being initiated by an Australian university in 2011. Worldwide, the professions of architecture and design of the built environment look to teamwork and collaboration to achieve sustainable solutions. National and cultural boundaries are traversed as a matter of practice. Spaces that transcend cultural spheres of understanding offer learning opportunities.

Set within the context of international education and internationalization, iDiDe offers a model of intercultural collaboration and student engagement. iDiDe is more than a generic international study tour. Primarily, there is collaborative academic leadership that comes from institutional partnerships between Australia and five Asian nations (Malaysia, Thailand, India, Indonesia, Sri Lanka), then, intercultural dialogue and intercultural understanding underpin the pedagogical approach, and finally, iDiDe projects extend disciplined specific learning into the realms of reality (Ang, 2018). International Dialogue through Design is a type of collaborative design, an activity that requires participation of individuals for sharing information and organizing design tasks and resources. Particularly in a complex and large project, design often involves multiple persons or groups collaborating in the design process. The purpose of design collaboration is to share expertise, ideas, resources, or responsibilities. Design communication is central to design development in the process. The effectiveness of design communication becomes critical for designers in sharing design information, in decision-making and coordinating design tasks (Chiu, 2002). High levels of participant engagement exist because of the appeal of travel. iDiDe has drawn upon this appeal and activated enriched learning environments through cultural immersion and collaboration with international peers. The learning objectives and graduate learning outcomes are aligned with discipline specific curriculum, and strategies for an internationalized syllabus. The major benefit of the students is gaining the essential skillset of a global citizen by understanding the feeling of

community engagement. Although the students interact with a different culture, own traditions and specific lifestyles, yet, they appreciate the design made with respect for the site and the importance of sustainability. Also, the iDiDe workshop represents a valid work and study experience as well as an outstanding travelling experience for the students.

iDiDe is a culmination of various activities designed for the all-round professional development of the student. The focus is mainly on the rigorous studio which runs for nearly three weeks. However, alongside the studio, a number of other activities such as travel, cultural immersions, inaugural activities, design charrettes, engagement and participation with the users, planning and conducting workshops, site visits, lectures, exhibition etc. are also part of iDiDe program. Apart from these, the students find their own time to explore new places, people, culture, dress, food, styles, architecture, materials etc. along with their fellow participants from other countries. Although, iDiDe program involves collectively a duration of 3 weeks, the excitement and planning start much earlier and continues even weeks after the students go back to their home Institutions since they exhibit their work later in their respective institutions. The students also raise funds to contribute to the needy community for whom they design and reach out socially to them. The journey of iDiDe begins with the recruitment of students a few months in advance across all partner Institutions and from then on, the students' exchange profiles and are actively in touch through social media. Every activity adds to the learning process of the student. This paper captures the learning outcomes as experienced by the students during the design studio and other activities of iDiDe.

iDiDe has been conducted in different countries of Asia since 2011, while Manipal School of Architecture and Planning (MSAP), Manipal Academy of Higher Education (MAHE) hosted iDiDe 2018 at Manipal, in which success of the design proposals for an Anganwadi (rural mother and child care centre) in Ajjarkad, Udupi was accomplished through a great sense of commitment towards the design goals set by participants from Deakin University, Australia, International Islamic University Malaysia and Manipal Academy of Higher Education, India. The results of Anganwadi, Ajjarkad included a sustainable built structure for integrated development of mother and child with the social, emotional, physical well-being in a supportive and healthy environment through a systematic and holistic design approach using the vernacular style and methods of construction. (Udayavani, 2019)

# 2.0 RESEARCH CONTEXT

Intercultural dialogue through Design (iDiDe, 2018 and 2019) was conducted by MSAP, MAHE in which the students designed Anganwadis in both the programs on the designated sites of Ajjarkad, Udupi district and Shirthady, Dakshina Kannada district respectively. Both the places are located in the state of Karnataka, India. Karnataka is a state in the south of India being the sixth largest in terms of area and comprising of 30 districts including Udupi and Dakshina Kannada.

# 2.1 Background

As a background for designing Anganwadis, literature is sourced, discussed and shared with the students for understanding the need, significance and the context. It may be noted that India has one of the highest percentages of malnourishment in the world. Apart from the immediate problems associated with being malnourished, a child suffering from malnutrition benefits less from schooling, because severe undernourishment hinders motor, sensory and cognitive development, leading to lower educational attainment and lifetime earnings (Alderman, Hoddinott, Kinsey, 2006). These problems become even more apparent when seen across different demographic and socio-economic groups. Underweight and malnourishment vary from 38 percent in the urban areas to 50 percent in the rural areas (Gragnolati et al, 2005). To improve the nutritional status of children in India, many programs resulted and the biggest by far being the Integrated Child Development Services (ICDS) scheme - India's integrated early childhood program, with a supplementary nutrition component - launched in 1975 as 'the foremost symbol of India's commitment to her children' (Natasha Audrey Ledlie, 2011). Under ICDS, Anganwadi is one of the most important objectives and interests, because the well-being of children is the main social concern in any state. Thus the Anganwadis were designed

by the students under the banner of iDiDe on both the designated sites of Ajjarkad and Shirthady with community engagement and involvement of non-community such as local government, society etc. The cohort of students who came from different countries, culture and lifestyles collaborated to design Anganwadis for the children of rural and non-rural communities with due engagement of the parents, teachers and other concerned stakeholders to address their needs and preferences. In the process of giving to the community, the questions asked in this research were, what were the learning outcomes in terms of skills, academic knowledge etc. The answers were found after the students went through a rigorous process of designing the Anganwadis based on the schedule of the iDiDe studio program.

Anganwadi is a type of rural child care centre in India, started by the Indian government in 1975 as part of the Integrated Child Development Services (ICDS) program to combat child hunger and malnutrition. *Anganwadi* means "courtyard shelter" in Indian languages. A typical Anganwadi centre provides basic health care in a village, being a part of the Indian public health care system. Basic health care activities include contraceptive counselling and supply nutrition education and supplementation, as well as pre-school activities (Gaurav, Niraj, & Diwakar, 2012). A typical Anganwadi is dedicated to rural areas and it can be found in any village of India. An Anganwadi normally covers a population of 1000 in both rural and urban areas and 700 in tribal areas. It involves different groups of beneficiaries. Intensive efforts are being made for improving the service delivery at the Anganwadi centres. An estimated 2 lakh Anganwadi centres have no building to locate their activities. There is therefore an urgent need to take up construction of buildings for these centres.

# 2.2 Design guidelines for Anganwadi Centres (AWC)

The Ministry of Women and Child Development (MWCD) has issued guidelines stating that AWCs should be child friendly with all relevant infrastructures such as separate sitting room for children, women, separate kitchen, store for storing food items and child friendly toilets and space for playing of children, both for indoor and outdoor activities and the space should be at least 55.7 m<sup>2</sup>. However, local design variations based on geo climatic conditions, local materials and context should also follow the guidelines of MWCD. There is a scheme for construction of Anganwadi centres financed through the convergence of schemes like MGNREGA (*Mahatma Gandhi National Rural Employment Guarantee Act*) which have restrictions to provisions in the guidelines. This was a constraint for the students to design the Anganwadi centre within the budget specified by the local Government.

ICDS guidelines Basic (Model) Infrastructure Requirements are a multipurpose hall for study or sleep area, kitchen with ample storage (preferably a separate storage space), children friendly toilets, examination room/nursing area for mothers, outdoor play area with the importance of a compound wall, basic amenities like perennial water supply for drinking and utility and reliable energy source, interactive learning tools in built as well as everyday items (Physical + Digital). Additional aspects that were considered to provide a holistic Anganwadi design are optimising functionality of spaces and adapting the solution to local social contexts (typologies of rural, urban, and tribal communities with specific pre-school education and care requirements).

Interactive methods and tools for learning can be introduced through different mediums like ceiling and wall hangings, flooring patterns etc. which kindles physical, gross and fine motor development in the children. Also, digital learning zone is suggested consisting of an e-tab and TV for innovative learning which increases physical, cognitive, and perceptual development in the children with raised seating. Sufficient storage spaces should be designed for education material, learning tools and records increasing safety and longevity of the materials. The basic design guidelines in the kitchen, the ease in cooking activity and hygiene can be reinforced by increasing required natural lighting. Water connectivity must be provided to the kitchen through a tap in the segregated utensil washing area. Also, outdoor utility space should be provided for better workability and hygiene to suit the rural contextual requirement (Selco, 2019).

Since mother care is one of the Anganwadi centre's mission, creation of a separate and private space for better mother care activities like consultation and counselling is mandatory. It should include a bed space, storage for awareness materials and health equipment and an attached toilet. There must also be provided child friendly toilet spaces with continuous water supply to the toilet and wash basins to improve hygiene levels. Less maintenance interior finishes and better natural lighting and ventilation lead to better maintenance of the space. Regarding openings, the placement of additional windows and ventilators must be done according to the orientation of the structure to create cross-ventilation which leads to better thermal comfort and increased day-lighting. This helps in enhancing socio-emotional well-being in children. It also should be provided an additional shading in the *angan* area for outdoor play activities for children and well-designed projection sizes over the openings for optimum shading (Selco, 2019).

# 2.3 Overview of the Sites for Design of AWC

The site for designing the Anganwadi during iDiDe 2018 was Ajjarkad. Ajjarkad is an area in the south of Udupi district, state of Karnataka. It features a Tropical Monsoon climate. The average annual rainfall in Ajjarkad is 4,030 mm and the average humidity is 75% and peaks in July at 89%. While the site at Shirthady is a village near Moodabidri town in Dakshina Kannada district. Shirthady is situated in a forest area, having a tropical climate. Rainfall is significant most months of the year, averaging 4574 mm, and the dry season is short and with little effect and the average annual temperature is 26.8 °C. intensive efforts are being made for improving the service delivery at the Anganwadi centres, an estimated 2 lakh AWCs have no building to locate their activities. There is therefore an urgent need to take up construction.



Figure 1: Site at Ajjarkad, Udupi, India (Source: Nandineni, 2018)

Figure 2: Site at Shirthady, Moodabidri, India (Source: Nandineni, 2019)

# 3.0 METHODOLOGY

To understand the learning outcomes of the students in iDiDe, the case of iDiDe 2018 and 2019, Manipal are being chosen for the study in terms of their studio activities, design process, design outcomes and other related activities during the entire program. To find the learning outcomes, the studio activities as prepared and occurred are detailed during both the programs. Also, the other activities of iDiDe programs which were planned earlier and any other unplanned activities during their stay have been noted to understand their influence on the learning outcomes. A brief overview of the studios for Ajjarkad and Shirthady have been discussed below. However, the other activities in both the cases, as observed have been considered in the study. Then the activities have been categorized for preparing a tool to collect the data for analysis.

# 3.1 Design of Anganwadi in Ajjarkad

iDiDe 2018 was conducted in India and Anganwadi was chosen as a philosophy and design building project in Ajjarkad, Udupi, Karnataka, since there was a dire need for the community. Over two weeks, students worked in teams of five, under academic mentorship, to reconcile and reflect upon diverse cultural frameworks and negotiated dialogue through engagement with local community stakeholders. A number of seven designs was proposed on the available area of 120 square meters, including key spaces like recreation area, food storage, kitchen, health care facilities with respect for the vernacular style and methods of construction as well

as sustainable approaches. External to the building a vegetable garden and an outdoor playground were designed. In the creative process, variables like temperature and heavy rains due to the warm and humid climate, wind direction, position of noise sources, presence of an old huge tree, disposal of waste and existing nearby buildings served as main pillars for creating a contextual design. This project provided the opportunity for students not only to be able to design for the women and children from the low-income families, but to experience the engagement with the beneficiaries themselves.



Figure 3: Design at Ajjarkad, Udupi, India (Source: Students, 2018)



Figure 4: Design at Ajjarkad, Udupi, India (Source: Students, 2018)

# 3.2 Design of Anganwadi in Shirthady

iDiDe 2019 took the responsibility of serving the rural community in Shirthady at Moodabidri in Karnataka. This time, the project frame was slightly changed, students working in less teams with bigger number of members each and having a budget restriction, a challenge that is part of the real social architecture work. Moving away from conceptual ideas within a typical studio, the project revealed the reality of the built environment and its potential impact on communities. The project actively prompted students to perceive and understand the environment through different lenses, and to push the boundaries of possibility and find a new familiarity beyond their normal comfort zones. The results were represented by five different designs on the proposed area of 400 m<sup>2</sup>, all of them providing multi-purpose rooms, separate health examination or nursery rooms, separate kitchen and children-friendly toilets, having versatility and practicality as main principles. The students worked with the children, parents, teachers, workers in the Anganwadi and health care providers in understanding their needs and adjusting the concept to suit, keeping in mind that stakeholders came from mostly rural backgrounds and spoke little to no English.



Figure 5: Design of Anganwadi at Shirthady (Source: Students, 2019)

Figure 4: Design of Anganwadi at Shirthady (Source: Students, 2019)

# 3.3 Overview of Activities during iDiDe Studio

The students schedule for iDiDe was structured from the day they arrived till they departed to their home University. The schedule consisted of majorly studio activities, travel activities, seminar and lecture activities, field trips for case studies and site study. The schedule displayed certain free days and time for the students to

explore on their own as well. The studio activities were sequentially based on the design process allotting sufficient time for each of the activity.

As a brief, the studio started with ice breaking activities with the collaborative iDiDe groups which were initially formed by the respective mentors of the participating Universities based on personality tests. The students used innovative methods to get to know their team members and created an identity for their group and presented themselves to everyone in the studio. Then, every day in the morning the studio would have expert lectures on the related topics of their work in iDiDe. The students travelled together along with the mentors to study the site and document the case studies. Along with this a preliminary meeting was arranged with the stakeholders and beneficiaries to understand their problems, preferences and needs to accommodate in their design proposals. Later, in the studio, the groups analysed the data collected and framed the requirements and design guidelines for starting their proposals. The students worked on concepts and communicated to the mentors through sketches, physical models, digital techniques etc. for comments and improvements. Since each of the teams had members with different skill sets, the students divided their work and time effectively to achieve their objectives. The first level designs were prepared along with models to present them to the stakeholders for their comments as a part of their participatory design approach. Meanwhile, since the primary end users of the Anganwadis were children between 2 to 6 years of age, the students wanted to have some memorable events with them and thus all the groups along with the mentors' brainstormed, pooled in the resources and managed their time in between, after and before their studio time to conduct hands on creative workshops for the children. The students also developed an emotional connect with the children and donated small things made on their own, which were cherished by the small ones. Another travel to engage with the community and stake holders was arranged to display and explain their designs with all the aids to communicate with the stakeholders. The students and the stakeholders were equally excited to put forth their views for the design of Anganwadi. Many practical and contextual issues were raised for the students to improve their designs and the community felt very important when their opinions and views were sought. The students made an attempt to visit the local places to explore the local materials for proposing in their respective designs. Hence, it may be understood that the learning was happening not only with respect to academics, but learning to deal with different people, in different situations and behave and conduct oneself in new places, with new people and culture. Later, back in the studio the students designed with enthusiasm, being equipped with the solutions for the comments they had during the design charrette. Another activity was a bigger task of preparing the posters for display in the exhibition conducted for the Government officials, community, University officials and the public. It was observed that students worked continuously with passion ignoring even food and sleep to give their best for the exhibition and the closing day of iDiDe. Apart from studio work, all the participants organised the event collectively, took care of all the small things and presented themselves on par with the local culture. After, the program the students helped each other in carefully packing the posters, display systems, etc. to leave the venue intact, which was a learning as well.

The other activities which were not structured happened during their free time and after or before studio hours. In the company of the local students, they explored eating joints, authentic food, shopping of clothes and others, travelled by local transport or walked by foot etc. Certain unplanned activities which cropped up either during inauguration or exhibition was also a learning experience for the students. Working and holding hands of the Anganwadi children for teaching them in the workshop was an activity which was totally voluntary from the students.



Figure 5: Design Charrette activity at Ajjarkad

Figure 6: Icebreaker activity at Shirthady

(Source: Nandineni, 2018)

#### (Source: Nandineni, 2019)

## 3.4 Learning Outcomes

Learning outcomes are defined as the knowledge, skills and competence the students develop at the end of any course or program. In design students gain hands-on experience working with clients (Nicol & Pilling, 2005), develop teamwork skills in groups of mixed expertise (Adamczyk & Twi dale, 2007) and gain an in-depth understanding of design cognition and decision making in a teamwork context. Teamwork learning is seen as being representative of work in practice where design is nearly always a collaborative activity (Tucker,2017). iDiDe is designed systematically keeping in mind the learning outcomes since for some of the Universities it is over and above their regular curriculum. The learning outcomes of iDiDe are transformative and deep authentic learning experiences through a framework of intercultural learning, sustainable solutions in the built environment, team work, collaboration, skillsets of a global citizen, intercultural collaborative learning, understanding of intercultural spaces, participatory design, nature of community engagement etc. (Ang.S, 2017).

However, in this paper the learning outcomes are specifically based on the students' perceptions and reflections who participated in iDiDe 2018 and iDiDe 2019 conducted by Manipal Academy of Higher Education. To capture their perceptions and reflections, an excel sheet was prepared with open ended question on each activity which was mentioned in the itinerary of the program and the last question was for them to comment on any other activity/activities which they felt due to which they had learnt something. A google form was prepared and the link was sent to all the 74 iDiDe participants among which only 16 responses were complete. Hence they were tabulated and analysed.

# 4.0 **RESULTS**

The data thus collected was sorted, analysed and all the learning outcomes expressed by the students were tabulated and a mutually exhaustive list was prepared. Through simple descriptive statistics the percentages were plotted against the outcomes to statistically find the similar outcomes expressed by the students during iDiDe program. The table below shows the outcomes and the percentage of students who have expressed the same in the google form sent to them.

S.No	Learning outcomes	Percentage	S.No	Learning outcomes	Percentage
01	Discovering new cultures	100%	07	User-sensitive design	94 %
02	Socialising	100%	08	Empathy	88 %
03	Team work	100%	09	Communication with officials	25%
04	New design approaches	100%	10	Designing within the budget	19%
05	Architectural knowledge	100%	11	New mind set	75%
06	Communication with users	100%	12	Evaluation of others' skills	44%

The above table is a measure of outcomes based on the students' responses, each being attained from different activities during iDiDe program. Among the outcomes listed above, statistically, it was found that all the respondents felt like they discovered new cultures, socialised and made new friends, discovered new design approaches, gained architectural knowledge and got enriched in team work skills and communication with users. However, it was also found that 94% felt that they learnt about User Sensitive Design and how to respond to specific user needs. Further, 88% of the respondents felt they empathized with the Anganwadi children (primary users) due to constant engagement with them, which helped them design better. About 75% of the students felt they developed new mind sets and 44% felt they could evaluate others' skills during the collaborative studio. Unlike their academic projects, about 25% of the students felt that they learnt to design within the given budget while adhering to other constraints. The findings are discussed in the following section.

# 5.0 **DISCUSSIONS**

The learning outcomes of the respondents found in this study correspond to academic, personal and interpersonal skills acquired from different activities of IDiDe. The students felt they discovered new cultures because of the collaborative groups and the strong bonding they develop across 3 weeks working together. They also learn to understand and appreciate each one's culture and the activities scheduled in iDiDe encourage appreciation and respect for each culture. The respondents felt like they had contact with a new cultural background, not only as a sum of traditions, local legends, heritage, religion, food, costumes, music but also mentalities. Cultural immersion has the biggest impact in terms of discovering a culture because it encourages personal interaction with a new background by organised trips, visiting Anganwadi centres and temples, talking to the locals and students of different countries as well. iDiDe gives ample time for one to have a personal experience regarding a new culture.

Another important outcome is Socialising, given the fact that the iDiDe studio recruits participants of similar age group and academic background. iDiDe facilitates the interaction of participants and creates opportunities for all the students to meet new people and make new friends. And setting up the teams as mixed groups made the students collaborate with people from different universities which had a good impact based on their responses, making them aware of new cultures and helping them in making new friends. The participants had exciting experiences meeting each other and they expressed that "*We shared a lot of common interests like gaming, photography, sketching, illustration and ended up in the same group when the iDiDe groups were made so it was nice. So I also made a lot of friends*". The ice breaking activity that had the main purpose to create a proper context for students to meet was considered as the most successful one by the participants. By discussing in groups in an informal setting they exchanged ideas and experiences, having fun at the same time.

Since iDiDe was created as an international architecture design studio with groups of students working together, team work was an important learning outcome. The results were satisfying, all the participants feeling like they used but also enriched their team working skills by brainstorming sessions, expressing own opinions, listening to others' ideas and also distributing the work 'on the basis of the group member's strengths'. All these were best implemented in the studio working sessions because that was the context in which the students collaborated for bringing out a new design for an Anganwadi centre. However, other activities like inauguration, ice breaking, case study and iDiDe exhibition were also noted as significant for team work. It was also found in the literature that teamwork skills are essential in the design industry where practitioners negotiate often-conflicting design options in multi-disciplinary teams (Tucker, 2016). Teamwork learning is seen as being representative of work in a professional practice where design is nearly always a collaborative activity (Tucker, 2016). Educators also recognise that teamwork can lead to an improvement in student learning due to the development of social behavioural skills, higher order thinking and critical thinking skills, the capacity for lifelong learning, moving students from a passive to more active learning role, the ability to tackle more substantially-sized assessment projects, and peer learning within teams (Tucker & Abbasi, 2014).

Two of the key academic outcomes, finding new design approaches and gaining architectural knowledge, were successfully achieved by all the students, proving that all aspects of the design process were detailed and discussed during the studio. From the findings, the students considered that the most important activities were the studio working sessions for the practical part, in which they exchanged ideas, analysed and solved problems related to design, learnt new soft wares, and the academic seminars for the theoretical part, in which they attended lectures on local materials, site and context, basic design of an Anganwadi centre and they gained ideas for their project. In addition, cultural immersion, site visit, case study, stakeholder meetings and iDiDe exhibition were also a part in ensuring the academic input. As expected, activities like academic seminars and studio working session should be the main parts in the schedule of all the future design studios since they assure serious outcomes.

Another learning outcome that all the participants reported is the communication with users. Being their first project in which the students had real beneficiaries, discussing with the users in order to get a feedback for the

design work was something new. Also, it was the first time the participants were talking to a special category of vulnerable users, the children, from a design perspective and their questions were: 'How to deal with children, get their attention, how to communicate with local stakeholders, how to empathize with the user group'. Working with children was easy for the students: they quoted, '*It was interesting to meet the kids, they had a lot of things to tell us like how is the food, how are the rooms, they gave us feedbacks of what we are supposed to do even if they did not talk much.*'. The activities that had the biggest impact talking about this type of outcome were the site visit and existing Anganwadi study and stakeholder meetings, because these were the times of actual interaction when the children, the teachers and the parents could express their opinions regarding the problems of existing Anganwadi, their needs and their suggestions for the new project.

Regarding academic skills, the students learnt about user-sensitive design associated with communication with the beneficiaries and this experience had all the attributes of a real architecture project and the students felt the responsibility to respond to users' needs. Social outreach and stakeholder meeting were the activities noted as having an influence in '*Sensitively considering the various users of a space and designing accordingly*' and are also the ones which should be given priority in future studios.

Empathy is one of the skills that was found to be significant for this type of experience in which two different social categories interact and in which the main aim is to understand specific needs, adapt a design and help the others by own forces. Therefore, it was not a surprise to see that the students felt they got enriched in this area, especially after social outreach, in which the students made toys and gave them to the children, and after site visit and existing Anganwadi study, which was the first interaction between participants and users. Designing for small children from low income families was a complete exercise for the students and quoted 'We are in the position of people who did not have to worry about what will be eat tomorrow or where will we sleep tonight, not like these kids who have parents that do not own that much. So we were thinking of the appreciation of the small things in life'.

The other learning outcomes based on students' responds were personal, regarding finding new mind-sets and the ability of evaluating others' skills. Both of them were gained during activities like inauguration and ice breaking because they were appropriate contexts for students to be able to share their ideas regarding personal visions in architecture. The participants found out that in design team-work, it is important to see what the teammates are up to and who you can work and why, because the ideas are flowing easier and the solutions are found faster while sharing the same views. Also, the students being away from home and in a different country had to be self-disciplined to keep up the timings and manage if something was not available. The learnings from such activities may not be academic but would add to their personal and personality learning. Some of the protocols followed in the host Institutions would have to be followed and which would be very different.

## 6.0 CONCLUSIONS

The iDiDe architecture studio serves as an architecture and built environment education platform. This paper informs that a social conscience and ethical considerations and other learnings can be developed by students in architecture and built environment through experiential learning and engagement with the community within the environment. Such platforms of global intercultural education, that look towards collaboration and partnership as well as stewardship of the local government including community resources can be of benefit when included as part of architecture and built environment education. The students would not have had this exposure without a program like iDiDe. Unknowingly, the students learn many things in the process which is a challenge for the researchers to identify these and publish with an idea to help pedagogy to design such collaborative programs.

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# BEING ON COUNTRY OFF COUNTRY: PERSPECTIVES FROM GUNDITJMARA AND QUANDAMOOKA COUNTRY'S

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Abstract: Being On Country Off Country: Perspectives from Gunditjmara and Quandamooka Country's Abstract: In Australia, Aboriginal communities are structured by Country embracing over 250 sovereign communities with similar and unique languages and cultures. 'Aboriginal' is a generic term that should be supplanted by a specific community name based upon Country. Country embodies Aboriginal rights to lands and waters that are not 'owned' by the community but rather, Country 'owns' the community. The scope of Country sustains a perpetual interconnected network of all tangible and intangible values across the spiritual, physical, social, and cultural landscapes. Today, while many Aboriginal people have returned to, or continue to live on their respective Country, the majority have coalesced off their respective homelands to reside on other Country in one of Australia's major urban and peri-urban nodes. This paper reviews this context, citing Gunditjmara and Quandamooka case studies, and investigates the extant protocol relationships of these peoples and their Country's towards better scaffolding of Country custodianship enrichment.

Keywords: Gunditjmara, Quandamooka, First Nations Peoples, Country, self, being, attachment

## **1.0 INTRODUCTION**

A person's connection to something can be deeply multifaceted and shape who you are, your beliefs, identity, spirituality, and customs. This could include your place of birth, physical, non-physical, or spiritual, or even a profound journey, both physically and/or throughout life. An Aboriginal person feels these connections, like everyone else, but there are so many more layers that make up an Aboriginal or First Nations persons 'connection'. One of the most profound examples is connection to Country.

The Oxford Dictionary online (2017) defines connection as:

'A relationship in which a person or thing is linked or associated with something else.'

This generic definition does not explore the connections of the Deep Past of First Nations peoples. Nor the way that their connection has formed since time immemorial and continues into future generations. Connection for an Aboriginal person and their community relies on seeing not only the tangible, but sensing the intangible, like spirituality, and linking to all the varied and complex elements of that.

This research will endeavour to consider, after displacement and generational 'unavailability' of many elements of culture and language, how do Aboriginal people, specifically the Gunditjmara remain connected or regain connection. Connection to Country informs an Aboriginal person's identity. According to Uncle Banjo Clarke in (Chance, 2003), Country is part of you,

"Them spiritual feelings for the land mean everything to us Aboriginal people-that's our life. It's part of our soul, and we're part of its soul."

There is a clear lack of research on how Aboriginal people connect with Country when they do not physically live on Country. Because of this relationship and lack of clarity, this research is relevant for not only Aboriginal

Australians, but First Nations people around the world. It will also inform non-Indigenous people that Aboriginal culture is still strong and alive, even when you do not live on Country.

There are several categories that relate to 'Being *on* and *off* Country'. These include:

- those who have lived on Country their whole life;
- those who have lived on Country sporadically (for both long and short periods);
- those who live just off Country;
- those who live off Country internationally;
- those who live on the other side of the Australian continent;
- those that have never lived on Country;
- those who generationally have not lived on Country (including parents/grandparents);
- those who have recently moved back to Country;

all having regard to male and female statistics and patterns, places and geography, and the comparison between old and young.

## 2.0 CONTEXT

It is an Australian myth that Aboriginals reside only in the far reaches of Northern Territory (NT), Queensland (Qld) and Western Australia (WA). Such is far from the truth. The 2016 Australian Bureau of Statistics census data records an Aboriginal and Torres Strait Islander (ATSI) population of approximately 649,171, or 2.8% of Australia's total population, and projects that this population will increase to between 907,800 and 945,600 people by 2026 (ABS 2011). The largest population concentrations of ATSI Peoples are in New South Wales (NSW) (208,500) and Qld (189,000), and they comprise 25.5% of the total population of NT (ABS 2016). More significantly, 35% of this ATSI population live in Australia's major cities and 20% in regional cities; 50.4% of Victoria's Indigenous population live in metropolitan Melbourne. These statistics confound this myth, and deceptively hide 'Country' of kin associations under generic 'Aboriginal' or 'Torres Strait Islander' categories, thereby not depicting real population profiles about Indigenous Australians. More importantly, the statistics raise questions about the sustainment, capacity and practice of Aboriginal relationships and engagement with their 'home' Country as distinct from their adopted or transitionary 'Country' of residence.

Figure 1 depicts the ATSI Languages around the Australian continent and waters.



Figure 1 – Aboriginal languages and nations map (after Tindale, 1959)

(Source: AIATSIS 2017)

Given the 'Being On Country Off Country' project we focus upon the Gunditjmara and Quandamooka communities in this contextual literature review analysis, including an analyse of statistical data, historical settlement patterns, population structure and the cultural dynamics of Aboriginal populations focusing in particular upon the urban footprints of Melbourne and South East Queensland (SEQ). Further examination of these two urban centres suggests the need for a framework towards the development of contemporary protocols to support Traditional Owners, urban Aboriginal populations, planning professionals and governments.

In contemporary history, in 2017 ATSI Peoples celebrated four important milestones: the 50<sup>th</sup> anniversary of the 1967 Referendum, 25 years since the historic Mabo Australian High Court decision, the 'Uluru Statement from the Heart' and "Our Languages Matter" (the theme for the annual National Aboriginal and Islander Day Observance Committee (NAIDOC) event). Each of these events reinforces the importance, resilience, and richness of ATSI Peoples and cultures in modern Australia. The evident diversity at these events is also characteristic of the diverse identities, relationships to '*Country*', settlement patterns and populations structure of Aboriginal Peoples. However, it is not yet reflected in data collected by the Australian Bureau of Statistics (ABS) (Biddle 2014).

In contemporary urban and peri-urban Australia, Aboriginal Peoples' identify with each other through geographic variables based on traditional cultural kinship systems. As an example, developed from various sources of non-ABS data, a basic level understanding of the Quandamooka People of SEQ and the Gunditjmara People of southwestern Victoria is tabulated in Table 1. It is clear in Table 1 that urban and peri-urban

Aboriginal Peoples identify through an ordered system of contemporary geographical and traditional variables of identity data. As a collective, Aboriginal Peoples truly are a diverse mob.

Colonial variables	Pre-colonial data variables – geography and kinship system			
Level 1 - State geographical based name	Level 2 – <i>Country / TO(TO) group /</i> Language group	Level 3 - Peoples / TO sub-groups / Place names associated to specific tracts of land	Level 4 - Family	
QLD – Murri	Quandamooka Country / Quandamooka Peoples / Jandai, Yuggera language	Nughi (Mulgumpin) Gorenpul (Minjerribah) Nunukul (Minjerribah)	Nuclear and extended family	
	< Mob - wholly or	at each level >		
VIC – Koorie (38 TO groups)	Gunditjmara Country / Gunditjmara Peoples / 10 language groups: Dhauwurd Wurrung, Koornkopanoot, Bi:gwurrung, Wulluwurrung, Gundara, Oykangand, Gugu Dhaw, Ngandi, Gundungerre, Kurtjar	According to the literature there are as many as 59 TO sub groups of the Gunditjmara People. It was decided for this tables that the 59 were too numerous to list.	Nuclear and extended	

Table 1: Basic level population data variables of the Quandamooka Peoples and the Gunditjmara Peoples

(Source: Austlang, 2017; Australian Government, 1995; Creative Spirits, 2017; QYAC, 2017).

However, not all the above mentioned variables are reflected in the data collection categories on Aboriginal peoples that are managed by the ABS. In 2017, the official ABS (2016) census data collections comprised only two relevant categories, which are the standard classification of "Indigenous Status" that are structured by 2 criteria levels and 4 categories represented in Table 2.

Γable 2 – Australian Bureau of Statistics data for the	e "Indigenous Status"	category
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	Level	Categories
1	Indigenous	Aboriginal but not Torres Strait Islander Origin
		Torres Strait Islander but not Aboriginal Origin
		Both Aboriginal and Torres Strait Islander Origin
2	Non-Indigenous	Neither Aboriginal nor Torres Strait Islander Origin
		(Source: ABS, 2016)

The ABS (2016) standard classification for "Australian Indigenous Languages" is structured by a broad group, a narrow group and language. Table 3 lists the Australian Indigenous languages by broad group and narrow group and only the total number of languages are included, not by name.

Table 3 – Australian Bureau of Statistics use of "Aus	tralian Indigenous Language	s" structure by broad group	and number of
	languagaa		

languages				
Australian Indigenous Language Spoken at home- by region	Number of languages			
Arnhem Land and Daly River Region Languages	50			
Yolngu Matha	56			
Cape York Peninsula Languages	20			
Torres Strait Island Languages	4			
Northern Desert Fringe Area Languages	16			
Arandic	12			
Western Desert Languages	18			
Kimberley Area Languages	15			
Other Australian Indigenous Languages	53			
(0 + D0 201()				

(Source: ABS, 2016)

The known and accepted Traditional Owner groups within the footprint of Melbourne Indigenous Region, listed in Table 4, are recognised under the Victorian *Aboriginal Heritage Act 2006 (Vic)* as 'Recognised Aboriginal Parties'. In terms of the Traditional Owner groups of the Brisbane Indigenous Region, at the time of writing, the available published sources recognised the groups listed in Table 4 however it is understood that more definitive research by the Queensland South Native Title Services will clarify and more closely define TO groups in the near future.

Table 4 – South East Queensland and Melbo	ourne Traditional Owner groups
South East Oueensland	Melbourne

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South East Queensianu	Wielbourne
Jagera	Wurundjeri
Quandamooka	Bunurong
Gubi Gubi	Wadawurrung
Yugambeh	-
(Source: SEQTOLSMA 2008	and VACL, 2011

Considering the scope and inconsistency of the data presented in Tables 1 to 4, through the ABS it remains difficult in urban and peri urban areas to determine qualitative data and the numbers of Aboriginal TOs according to language group, clan and the resident status of being 'On Country' or 'Off Country'. Biddle (2014) asserts a deficiency in ABS data according to specific geography, or 'Country' and the Aboriginal Peoples that belong to it and quality data that may assist the right planning concepts.

This paper seeks to highlight current limitations of data on Aboriginal Peoples that is counterproductive for determining Aboriginal identity and well-being, and to gain a deeper understanding of Aboriginal Peoples connections to *'Country'*.

Through analysis of the recently released 2016 ABS census data and links to the four milestones, the overarching objective of the paper is to discuss ways to improve data about Aboriginal Peoples that will assist planning professionals and Aboriginal communities to consider formal processes, innovative strategies and beneficial Indigenous planning outcomes in urban and peri-urban areas.

## 3.0 CASE STUDIES – QUANDAMOOKA AND GUNDITJMARA STATISTICAL ANALSIS

The Brisbane Indigenous Region and Melbourne Indigenous Region were chosen as research case studies. Figures 2 to 5 illustrate and offer comparison of the defined footprints for each Indigenous Region and their respective State Government Regional Planning footprints. It is clear when comparing Figures 2 and 3 that the footprints for the Brisbane Indigenous Region and the SEQ Regional Plan are identical. The footprint for the Melbourne Indigenous Region (Figure 4) and the footprint for Plan Melbourne regional map (Figure 5) are also identical.



Figure 2 – Brisbane Indigenous region

(Source: ABS 2007)

Figure 4 – Melbourne Indigenous Region (Source: ABS 2007)





**Figure 5 – Footprint, Plan Melbourne** (Source: Plan Melbourne 2016)



However, of the two regional plans, *Plan Melbourne* (2016) does not include a regional map depicting the recognised Aboriginal TOs of the area, which are the Wurundjeri, Bunurong and Wadawurrung Peoples. This

deficiency at the regional planning level dilutes the importance of Aboriginal peoples to the cultural fabric of Melbourne and fails to provide support for data matching of TOs according to their respective '*Country*'.

An analysis of ABS data relating to each Indigenous region includes the categories of 'Indigenous Status' and 'Australian Indigenous Languages', which are obtained from ABS Quickstats (2016). For the purposes of this research, the ABS data relating to 'Ancestry' have been excluded because the responses are more focussed on non-Indigenous attributes. However, it is acknowledged that this data should be explored further for its possible merits in later research. The results and analysis of the census data for the Brisbane Indigenous Region and Melbourne Indigenous Region for the years 2016, 2011 and 2006 are summarised in Table 4.

anu 2000	0					
			Cens	us year	S	
Brisbane IREG - Indigenous Status	2	2016	201	1	2006	
Aboriginal	6.	3,160	46,8	80	35,866	
Torres Strait Islander	4	,042	3,68	80	3,361	
Both Aboriginal and Torres Strait Islander	3	,533	2,70	38	2,142	
TO	TAL 7	0,735	53,2	68	41,369	
Australian Indigenous language - top respons	es 2	2016	201	1	2006	
Yumplatok (Torres Strait Creole)		170	14	1	132	
Aboriginal English, so described		86			43	
Other Australian Indigenous Languages		29	45	5		
Kriol		21	29	)		
Wiradjuri		19				
Gamilaraay			16	5		
Kalaw Kawaw Ya/Kalaw Lagaw Ya			14	ł	17	
Guugu Yimidhirr					9	
Wik Mungkan					9	
English only spoken at home	6	6,787	50,2	55	38,652	
Melbourne IREG – Indigenous Status		20	16	2011	200	6
Aboriginal		21,	589	15,876	12,43	37
Torres Strait Islander		1,1	20	1,226	1,25	5
Both Aboriginal and Torres Strait Islander		59	98	485	439	)
	TOTAL	23,	307	17,587	14,13	31
Australian Indigenous language - top respons	es	20	16	2011	200	6
Aboriginal English, so described *		1	7		8	
Yorta Yorta *		1	5	10		
Wiradjuri *		1	0		0	
Wajarri		ç	)		0	
Luritja					8	
Arrernte					8	
Kunwinjku					5	
Tiwi					5	
Kriol				16		
Ngarrindjeri				10		
Djabwurrung				10		
Bidjara				6		
English only spoken at home		21,	455	16,164	12,64	16

Table 4 – Census data, Brisbane Indigenous region and Melbourne Indigenous Region – quickstats 2016, 2011
and 2006

(Source: ABS 2016)

In relation to Table 4, most Indigenous Peoples residing in the regions in each census period are of Aboriginal descent. In 2016, the Brisbane Indigenous Region recorded 63,160 persons with an Indigenous status of 'Aboriginal'. Similarly, the Melbourne Indigenous Region recorded 21,589 persons with an Indigenous status of 'Aboriginal'. A small number of the two regional Indigenous population are both ATSI, with Brisbane recording 3533 persons and Melbourne 589 persons. The Indigenous populations in both regions has almost doubled between 2006 and 2016. It is abundantly clear that the same question about Indigenous status has continued over the three census periods (Biddle 2013), and this offers planning professionals and governments a very limited insight into the lives of Aboriginal people living in urban and peri urban areas. There is no mechanism to identify specific TO groups or if they're residing 'On Country' or 'Off Country'.

Interestingly, the data in Table 4 for the Brisbane Indigenous Region indicates the top numerical response for an Australian Indigenous Language as Yumplatok (Torres Strait Creole). Yumplatok also is the top recorded Indigenous language in SEQ for the 2011 (141) and 2006 (132) census periods. A list of 8 other Indigenous languages is listed and English is by far the top language spoken at home in the Brisbane Indigenous Region, recording 66,787 persons. However, none of the listed languages relate to the TO groups of SEQ and therefore provide no use for regional planning for SEQ TOs.

The top numerical response for Indigenous languages in the Melbourne Indigenous Region for 2016 (ABS) is Aboriginal English (17), followed closely by Yorta Yorta (15) [from the River Murray region], Wiradjuri (10) [from central NSW] and Wajarri (9) [from the Murchison area of WA] as distinct from the Woi wurrung language of the Wurundjeri People. In comparison, more speakers of Wiradjuri language were recorded in the Brisbane Indigenous Region (19) in the 2016 census. English is also the top spoken language for Indigenous people residing in the Melbourne Indigenous Region. This data may not be consistent with several programs managed by the Victorian Aboriginal Languages Corporation (VACL), which relate to the Gunditjmara Peoples.

At the local level, data strictly relating to the Quandamooka Peoples and the Gunditjmara Peoples has been obtained from their respective RNTBC, which are the Quandamooka Yoolooburrabee Aboriginal Corporation (QYAC, 2017) and Gunditj Mirring Traditional Owners Corporation (Gunditj Mirring, 2017). Included is 2016 (ABS) census data on Aboriginal Peoples at the Level 3 Statistical Area and Local Government Areas (LGA) that affect current claims and determined areas of recognised Native Title for the Quandamooka Peoples and Gunditjmara Peoples.

	Census Year
Quandamooka Country, Aboriginal Peoples by ABS Statistical Level 3	2016
Cleveland and North Stradbroke Island	1,849
Scarborough, Newport and Moreton Island	200
TOTAL	2,049
Quandamooka Country, Aboriginal Peoples by LGA, ABS Community Profile	
Redland City Council	3243
Brisbane City Council (includes Moreton Island	15807
TOTAL	19,050
Quandamooka Yoolooburrabee Aboriginal Corporation (RNTBC)	
Memberships - 30 June 2016	640
Gunditjmara Country, Aboriginal Peoples by ABS Statistical Level 3	2016
Warrnambool	734
Glenelg - Southern Grampians	715
TOTAL	1,449
Gunditjmara Country, Aboriginal Peoples by LGA, ABS Community Profile	
Moyne Shire Council	183
Southern Grampians Shire Council	238
TOTAL	421
Gunditj Mirring Traditional Owners Aboriginal Corporation (RNTBC)	
Memberships - 30 June 2016	457

#### Table 5 – 2016 ABS census data for Aboriginal Peoples by Statistical Level 3 and LGA in relation to determined Native Title boundaries

(Sources: ABS, 2016; LGAs various, 2016; Gunditj Mirring, 2017; QYAC, 2017).

As documented in Table 5, of the 640 registered QYAC memberships, using postcode data QYAC (2016) some 38% of Quandamooka People live 'On Country' either on Minjeriibah (22.5%) or elsewhere 15.8%). The remaining 62% reside 'Off Country', either somewhere else in Qld (48.6%), outside of Qld but in Australia (12.9%), or overseas (1.5%). It must also be noted that under the Native Title Act 1993 and subsequent regulations for RNTBCs, only TOs of a Native Title determination are entitled to membership (AIATSIS 2014). A similar analysis of the Gunditjmara has not yet been published. Although, it is possible for Gunditj Mirring RNTBC to complete the analysis using postcode data from its 457 memberships.

At the local planning level, the Quandamooka Peoples and Gunditjmara Peoples can determine the numbers of members and resident status of members living 'On Country' or 'Off Country'. However, in terms of identifying TOs that are not yet members, it is unclear if QYAC or Gunditj Mirring are able to identify TOs and residency through in-house corporate data collection programs or informal networks.

There is no way for QYAC or Gunditj Mirring to distinguish TO cohorts within the respective ABS Level 3 Statistical data or the LGA profiles and therefore it is not possible to determine if TOs are residing 'On Country' or 'Off Country'.

In terms of urban and regional planning, a more useful Aboriginal TO Community Profile would need to consider expanding each of the ABS data sets relating to Aboriginal Peoples to include TO relationships to Country, resident status of TOs being 'On Country' or 'Off Country' and language group identity. It should also consider RNTBC memberships and any Native Title claim areas or already determined areas where Native Title is recognised.

# 2.0 SUMMARY OF DRAFT FINDINGS - GUNDITJMARA

The following section presents preliminary questionnaire investigations with Gunditjmara People. Within this data catchment are 53 completed questionnaires, with the majority being women. All age groups are covered

from 18-65+. It is recognised that more survey participants are required, in particular more Gunditjmara Elders living on Country, to realise a quality sample number and also an equal number of male / female participants.

Analysing the responses has shown that many live off Country, mainly for work. But the connection to Country in no way is diminished if you life off Country. There are also those who have more knowledge about current caring for Country programs than others, even those who live on Country. Of note is one respondent who feels 'very disconnected' and has not lived or visited Country at all. There is also a person from the Stolen Generation who is striving to learn more about their people and culture. Of interest is one of the respondents who lives on Country and is attuned to his culture and Country noted that some who are trying to reconnect to Country, have been going about it the wrong way and with no guidance, but as soon as they find the right Gunditjmara person to help them, they connect the right way. There are also some who have never been on Country, or attended Gunditj Mirring meetings, but the majority do receive meeting minutes to keep them updated. Questions were also asked whether they are multi-clan and if they currently live on Country of that other clan. This was done to establish whether they have any access to culture and language at all that they are connected to. Questionnaire starts with question 2.



Female data was collected at a higher rate, as this researcher is a female Indigenous women, they were more open to sharing, this may have been different if I was male

## Question 2: How does it feel to be Gunditimara?

General themes include, connection through heritage, the future, proud, respect, strong, family, belonging, identity. With further more in-depth cultural connections such as, 'part of me like breathing', or finding it 'hard to explain in words'. There was a mixture of physical or tangible connections mentioned like Native Title, and the physical landscape, but there is also much mention of Ancestors and their strong, proud line, both Ancestral and invasion times and the legacy that leaves for modern day Gunditjmara. Family and sense of belonging is highlighted throughout. This is common throughout the age groups and genders, and also doesn't mention anything about any of these themes diminishing or being less Gunditjmara on or off Country.
The 14 apical ancestors of the Gunditimara are listed below

-					
No.					
1	Jenny Green (Alberts line)				
2	Timothy James Arden & Barbara Winter				
3	Mary (unknown surname), mother of James Egan				
4	Billy & Mary Gorrie				
5	William & Hannah King				
6	James Lancaster				
7	Susannah McDonald (Lovett line)				
8	Mary McKinnon				
9	Eliza Mitchell (Saunders line)				
10	John Henry Rose				
11	James & Mary Sutton				
12	Louisa Taylor				
13	Andrew & Ellen Winter				
14	Lucy Sutton				

Source Consolidated Rule Book 2017

## Question 4: Are you connected to any other Aboriginal Language Groups (Multiclan)?

Just over half identified as multi-clan, but not many lived on the Country of their other clan.





## Question 6: If you are multiclan, what town or city do you live in?

This was general information to see how close respondents lived to either Gunditjmara Country or their other clans Country as a few respondents were multiclan and it forms [art of their identity so has to be included. Many living in Melbourne, with a few living in Shepparton and a couple in Qld.

## Question 7: If you are multiclan, how long have you lived ON Country of your other clans?

This question was posed to find out how many lived ON their other Country to compare how long they have lived ON Gunditjmara Country (questions 20 to 29).

## *Question 8: If you are multiclan, how long have you lived OFF Country of you other clan/s?* As with question 7

## Question 9: Do you have any non-Indigenous heritage?

The majority answered yes to this question, some parents, grand-parents and one great-great-grandparent.



Question 10: If you have any non-Indigenous heritage, it is your mother, father etc?



Question 11: What is your age range?



Q 12: Are you male or female?



## Q 13: Is Country Spiritual or Physical?

Out of 53 responses, 47 responded Country as 'both', while the remaining 6 said it is only spiritual and is within your spirit. No one stated that it was simply a physical thing.

## Q14: What does Country means to you?

Themes of both ancient, recent (Native Title), spiritual and physical definitions including, Songlines, stories, spirit, Ancestors, keeps them safe, if Country is ill, they are. One highlight is the sense of belonging that many mentioned and also the 'electrical connection' felt, the emotional connection, and the continued journey to protect it. Many also noted that even though they live off Country, Country is always home. One who currently lives overseas, still calls Country home and many have a sense of belonging to Country. The ability of passing on knowledge to children was also highlighted by many. Of note, one respondent had never been on Country, but still connects to it through her grandmother, while another describes being 'very disconnected' living in QLD.

## Q15: How do Gunditjmara care for Country?

Many noted that drones were being used to map Country, through Land management regimes, fishing, hunting etc while others noted that caring for Country is a spiritual thing as well as physical, by looking after it through song, stories, language. One respondent quoted that elements of Country are at the same level of self, 'this rock is as important as you are'. While others focus on the organisations such as Gunditj Mirring as having the capacity to allow Gunditjmara to care for Country. One respondent noted that keeping culture strong is in turn caring for Country by 'making the culture relevant to each generation' achieves this.

## Q16: Is there any NON-SECRET places that you are willing to share?

Many quoted Budj Bim as the main one, also Tyrendarra, Kurtonitj, Lake Condah, the eel traps, and more modern places such as the graves at Condah and the massacre site at the Convincing ground. Many respondents also commented that they didn't know of any, some living on Country.

## Q17: Are there any Gunditjmara Creation Stories or Songlines that you could share? Do any relate to the stars?

Many respondents were not aware of any, but those noted include the 7 Sisters, Budj Bim, and seasonal navigations, Net Nets, shooting starts, shark and stingray, and Deen Maar when the spirits of the dead go.

# **Q 18:** Country: spiritual, physical, tangible, intangible....do you have to live ON Country to feel connected? Majority said no.

Q 19: Country: spiritual, physical, tangible, intangible....do you have to live ON Country to feel connected? If not, why not?



Responses included majority answered 'no', while those 9 who responded as 'yes' gave reasonings why such as, 'at least have to visit'; or 'feel more connected when on' but they find ways to connect while off as well. Some say that you have to be on Country to read its signs. Of note is one response that connection can only be felt on Country.



Question 20: Do you live ON Gunditimara Country currently?





Jones, D.S., Ang, S. & N.M. Nawawi (eds.), From Engagement to Impact: 1<sup>st</sup> International Research Symposium on Sustainable Rural Built Environments (SRBE), Kuala Lumpur, January 27-29, 2020, pp.1–293. ©2022, iD-IDF Sustainable Rural Built Environments Research Network through the International Islamic University Malaysia, Kuala Lumpur, Malaysia, and Deakin University, Geelong, Australia.



Figure 2 Gunditjmara (Gunditj mirring members) population greater Australia



Figure 3 Gunditjmara (Gunditj mirring members) population greater Victoria and South Australia



Figure 410 Gunditjmara (Gunditj mirring members) population greater CBD

Question 21: Does your immediate family live ON Gunditjmara Country?



Question 22: How many of your immediate family live ON Country?



Question 23: Does your extended family live ON Country currently? (aunties, uncles, cousins etc)



Question 24: How many of your extended family (aunties, uncles, cousins etc) live ON Country currently?



Question 25: Has your immediate family lived ON Country for more than one generation?



## Question 26: How many generations?

Majority note since time began, many between 3-8 generations that they can trace, some do not know.



Question 27: Have you lived ON Gunditimara Country sporadically?

It seems numbers are a bit more even where people have lived at some stage ON Country as analysed in the following table.

Question 28: Have you lived ON Gunditimara Country sporadically, how long for?



Question 29: Do your grandparents still live ON Country?



*Question 30: What opportunities are there for ON Country cultural practises?* There were three main responses were Cultural Heritage, language and cultural workers.

## Question 31: Do you know of any new ways of culturally mapping Gunditjmara Country?

Most people were aware of the drone mapping, one noting a helicopter. Some also noting that technology must be backed by Elders and hands on cultural knowledge and experiences.

Question 32: MISSION ERA: Was your immediate family moved to another mission?



Question 33: Did your immediate family settle in the area of that Mission/Reserve?



Question 34: Has your immediate family remained there and OFF Country due to the Mission period?



## Question 35: What do you hold dear about Lake Condah and the Mission site?

Many hold fond memories of both Lake Condah and the recent history of the Mission site. Some feel the Mission site has connections to their parents, grandparent's childhood growing up there, while others feel 'ill and uncomfortable' there and that its location is disrespectful. Common themes, of history, strength, tough recent times, family stories of growing up there, family gatherings and one would 'die for it' just as you would for your child. Basically, both the ancient and historic connections are held at the same level for the respondents.

## Question 36: How long have you lived OFF Country?



*Question 37: Connection to Country is within you, so does living geographically far from Country change this at all?* 



## Question 38: What helps you stay connected to Country if you are OFF Country for any amount of time?

Keeping in contact with family measured highly in the response as nearly everyone responded with family. Music, art dance and also social media were others ways mentioned. Connect to Country where you live, the similar elements that remind you of home, like taking your shoes off to feel the earth or visiting the waterways.

Question 39: If you life OFF Country for extended periods of time or generationally, do you have access to any type of cultural activities where you live, be it Gunditjmara or the local Aboriginal culture?



## *Question 40: What struggles/hurdles are there to remain connected when you live in a major city OFF your Country?*

Struggles listed were work commitments and time constraints, as many live in Melbourne and it is a big drive to get to Western Victoria. Some mentioned they miss watching the seasons on Country, spending time with the Elders, not being able to physically care for Country. Others are not sure who to go to get their children out on Country by not having family support and not knowing the area.

Question 41: Do you feel you have opportunities for input into cultural heritage management/partnerships/consultation processes etc when OFF Country for extended periods of time or generationally?



Question 42: Is there any language programs that you feel are easily assessable to Gunditimara that live OFF Country?



# *Question 43: How regular are these language workshops/programs, and do you think there should be more?* People responded by suggesting there should be more, both on and off Country in Melbourne or where the

people are. They also listed VACL as a good resource and that they should be held regularly from, weekly, monthly to yearly.

## Question 44: Do your children attend Heywood Secondary College?

Everyone responded 'no' to this question.

## Question 45: Do they attend language classes there?

It seems that all respondents didn't have children going to Heywood Secondary college, but 3 have stated that they attend language classes at Heywood. Further investigation into whether there is a public language class held at the college is needed. It may also be past students as it is only run for year 8s.

## Question 46: Do they use language because of it?

Four people have stated that they do, so further investigation is needed as in previous question.

#### Question 47: Do you attend Gunditj Mirring meetings?



Question 48: At the Gunditj Mirring meetings, do you attend as an individual or a family representative?



Question 49: How often do you attend the Gunditj Mirring meetings?





Question 50: Where do you have to travel from to attend Gunditj Mirring meetings?

Question 51: Do you feel the Gunditj Mirring meeting structure keeps all members informed of cultural, heritage management, language etc maters?



## Question 52: What are the difficulties of attending Gunditj Mirring meetings?

Main difficulties include work and school commitments, time constraints, distance (4 + hours travel one way), money (reimbursement system). One of the younger respondents stated that the youth voice isn't taken seriously

Question 53: If you DO NOT attend Gunditj Mirring meetings regularly or at all, do you still receive the information that is discussed in the meetings?



#### Question 54: In what form to you receive the information?



#### Question 55: Is there anything else that hinders your attendance at Gunditj Mirring meetings?

Suggestions of attending the meetings via skype, while another suggested that skype wouldn't work in a community structured meeting. The lateral violence that occurs. It was also suggested to hold some meetings in Melbourne for the many who live there.

#### 4.0 CONCLUSIONS

The brief review of literature, analysis of official data sets and interpretations of the results clearly raises important issues about data on Aboriginal Peoples that reside in urban and peri urban areas.

Since the commencement of reporting official numbers of Aboriginal Peoples by the Commonwealth there has been consistent failure of that data to account for the uniqueness of the Aboriginal population in terms of diversity, Traditional Owner relationships to 'Country', the resident status of Traditional Owners being 'On Country' or 'Off Country' and the cultural needs of Aboriginal Traditional Owners living in urban and periurban areas.

In the wake of the 'Uluru Statement from the Heart', there is scope for the suggested Makarrata Commission to include a policy for improved data sets that would identify Aboriginal Peoples according to their ancestral '*Country*'. A more complete community profile has the potential to encourage increased levels of Aboriginal participation in land use planning activities, management of '*Country*', community cohesion, cultural wellbeing, and Indigenous community planning at the local level rather than the pan approach that continues to place Aboriginal Peoples into a single identity, particularly in urban and peri-urban areas.

Historically, the Mabo decision will continue as an annual event, as will future reforms to the Native Title system and dismissals by the Federal Court of Australia for claims for Native Title over urbanised areas. Therefore, perhaps it is time that Aboriginal TOs and 'Off Country' Aboriginal Peoples, governments, developers and the wider community collaborate towards for an alternative system that ensures acknowledgement of Aboriginal Peoples and inclusion of Aboriginal Peoples' cultural needs and well-being as having a permanent place in the planning of urban and peri urban areas. A significant input into a system as such would mean resolving issues with data on Aboriginal Peoples and developing more robust community profiles to reflect the diversity of Aboriginal TOs residing 'On Country' or 'Off Country' in urban and peri urban areas.

In terms of the preliminary Gunditjmara questionnaire data analysis, it was found that Gunditjmara culture is unique. The Gunditjmara have manicured and manipulated their environment for millennia. Creating permanent basalt houses and creating an intricate engineered *kuyang* aquaculture system. This management has remained today, accompanied by in depth knowledge of aspects of culture such as seasons of which Gunditjmara have six. Cultural retention, reclamation and maintenance in caring for Country in the 'old ways' and complementing them with Western science has enabled partnerships between GMTOAC and conservation land management agencies. This includes conducting cultural flows and cultural burns. It also includes the reflooding of *Tae'rak* allowing the weirs to have water flowing once again through them and be used to catch

*kuyang,* creating opportunities for sustainable tourist ventures. Overall, the connection to Country, culture, language, and self are seen as one entity.

Analysis of the questionnaire data suggests that simply being Gunditjmara is the defining factor of their identity, connecting them to family, belonging, bloodline, Clan, and the pride they find in that connection. This is echoed by questionnaire participant FX45-54#8 who stated being Gunditjmara is 'as much part of me as breathing.' Family connections were also strong with many having multiple connections throughout Victoria and some in wider Australia. Names were omitted in the anonymous questionnaires, however the GMTOAC membership lists show that the largest Gunditjmara families were the Lovett's, McDonald's and Albert's, Sutton's and Rose's listed as members of GMTOAC living On and Off Country.

#### HUMAN ETHICS PROTOCOLS

As clarification part of this research commenced at Deakin University, through an ARC-funded investigation led by Griffith University, and all the formative protocols and in-field user research were completed whilst the one candidate was enrolled at Deakin University, but due to circumstances caused by COVID 19, the candidate transferred to Monash University to complete the final write-up phase of this dissertation.

This research was subject to a successful Human Ethics approved application by the Deakin University Human Research Ethics Committee (DUHREC) entitled 'Being On Country Off Country' coded 2016-276 dated 14 September 2016, issued following approval of a Human Ethics Application to the Griffith University Human Research Committee (GUHRC) entitled 'Being On Country Off Country' issued for the period 1 August 2016 to 30 July 2020 to Professor Darryl Low Choy. One candidate fully passed Deakin University's Human Ethics protocols. This candidature commenced following October 2016 so was subject to Deakin University's PhDXstra track, and the candidate has passed the required SSC900 Academic Writing and Communication unit in T1/2017.

This research, entitled 'Being On Country Off Country', is subject to an approved Cultural Heritage Permit WAC-P0031 issued by the Wathaurong Aboriginal Corporation in accordance with s.36(1) of the *Aboriginal Heritage Act 2006* (Vic) dated 28 August 2019.

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## RESEARCH ON THE DEVELOPMENT OF MINSHUKU INDUSTRY IN CHINA IN THE GOLDEN DECADE BASED ON THE PROTECTION AND INHERITANCE OF VERNACULAR ARCHITECTURE

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Abstract: Under the background of the strategy of rural revitalization proposed by the Central Committee of the Communist Party of China, China has set off a boom in rural construction. The protection and utilization of vernacular architecture is an important part of rural revitalization, which plays a significant role in the development of local tourism, industrial structure adjustment and economic development. At the same time, the rapid development of rural tourism has promoted the booming development of the Minshuku industry. However, the rural architecture and rural environment are the basis for the design and construction of the Minshuku industry. The purpose of this article is to study the development of the Minshuku industry in China in the past ten years, to explore the significance and problems of the Minshuku industry in the protection and use of rural buildings, and to make some suggestions for future design and development.%

Keywords: Minshuku industry; vernacular architecture; protection; inheritance

#### 1.0 POLICY BACKGROUND AND NECESSITY OF RURAL CONSTRUCTION

"When the countryside prospers, the country prospers; when the countryside declines, the country declines." When investigating the process of China's economic development, it is not difficult to find that China is still and will be in the primary stage of socialism for a long time. This feature is largely reflected in the countryside. Implementing the strategy of rural rejuvenation is an inevitable requirement for resolving the major contradictions of our society in the new era, realizing the "two hundred years" goal and the Chinese dream of the great rejuvenation of the Chinese nation, it has great practical significance and far-reaching historical significance. The strategy of rural rejuvenation deeply grasps the laws of modernization and the changing characteristics of urban-rural relations. In response to the desire of hundreds of millions of farmers for a better life, it has proposed a 20-character policy: "prosperous industries, ecological livability, rural customs, effective governance, and rich living", these are opportunities for comprehensive rural development.

#### 2.0 THE SIGNIFICANCE OF PROTECTION AND INHERITANCE OF VERNACULAR ARCHITECTURE FOR RURAL CONSTRUCTION

Vernacular architecture reflects the unique lifestyle and geographical characteristics in a specific area. One of the important contents of rural construction is the maintenance of traditional and excellent vernacular architecture heritage, solving the problems encountered in the process of protection and inheritance of ancient villages, and better coordinate the relationship between protection and development. Indigenous architecture is essentially the external manifestation of vernacular spirit and local culture during its passage of time. Rural construction and the heritage of rural architecture are inherited in the same vein. The modernization of rural villages does not represent a major demolition. Facing the representative factors of the rural characteristics of rural architecture has regional characteristics, the vernacular architecture in each region shows the historical, human, and artistic characteristics of a specific area. Therefore, it is the real revitalization to give the rural architecture an accurate positioning and handle the relationship between rural architecture and rural development.

## 3.0 THE INFLUENCE OF THE MINSHUKU INDUSTRY ON THE PROTECTION AND INHERITANCE OF VERNACULAR ARCHITECTURE

In recent years, with the efforts of many architects, scholars, and people who are concerned about vernacular architecture, the heritage of vernacular architecture has achieved great results, and many feasible methods have been explored. Amongst them, the "Minshuku" originated from Japan has played a role in continuation and expansion of the use of vernacular architecture and has become one of the hot topics in the protection of vernacular architecture.

Minshuku refers to a small accommodation facility that uses local idle resources and the host's owner participates in the reception to provide visitors with experience of the local nature, culture and production

lifestyle. It is different from traditional restaurants and hotels, and does not have high-end luxury facilities, but it allows people to experience the local atmosphere, feel the warmth and service of the hostel, and experience a life different from the past.

On the one hand, the Minshuku uses the free rooms of its own homes, combined with local humanities, natural landscapes, ecology, environmental resources, and agricultural, forestry, fishery, and animal husbandry production activities, to provide personalized accommodation for outings or travellers. The Minshuku itself is a business space that uses rural buildings and has been appropriately transformed. The process of transformation and the protection and utilization of vernacular architecture have the same purpose.

On the other hand, Minshuku can also promote the development of rural tourism. The fast-paced life of the modern metropolis makes people eager to go to the countryside to experience a different life. With its natural and original advantages, Minshuku has become the first choice for many people in rural tourism and leisure. The development of the Minshuku industry brings more funding support and attention to the heritage of rural construction and the heritage of vernacular architecture. It has completed the transformation and upgrade of rural economic development methods in a clever and unspoiled way, thereby affecting the heritage and development of rural architecture.

#### 4.0 DEVELOPMENT STATUS OF THE MINSHUKU INDUSTRY IN CHINA

Before 2010, China's Minshuku industry has not yet developed and formed mainly farmhouses, family hotels, and inns. Compared with the optimized Minshuku industry, it has the characteristics of farmhouses, low-end, and scattered. Its scale is either a farmhouse in a rural area, or an inn in a village or an ancient town. Its development carrier is mainly local architecture. After 2010, due to the rapid development of the tourism industry, which is the cornerstone of the development of the Minshuku industry, China's Minshuku industry has also entered a stage of rapid development .China's tourism and holiday demand has also shifted from business travel to personal travel, tourists' individualized demand for accommodation has increased significantly, and the Minshuku market has entered a period of rapid growth, the original farmhouses and family hotels were influenced by design elements and foreign Minshuku spaces. With its high-end and centralized characteristics, its scale has also been expanded. There have been many Minshuku clusters and overall village vacation Minshuku. Its investment operators have also been developed mainly by local villagers or individuals, collectives and foreign owners into government and hotel companies.

With the introduction of the 2016 "Several Opinions on Further Promoting Agricultural Supply-Side Structural Reform and Accelerating the Cultivation of New Motive Forces for Agricultural and Rural Development", vigorous development of the rural leisure tourism industry has been put on the agenda, and more and more traditional villages have entered the Minshuku Development Road.

According to "2016 China's Minshuku Market Research Data", the size of China's Minshuku industry market reached 20 billion yuan in 2015. At the beginning of 2016, there were 40,000 Minshuku in China, and the number of Minshuku workers exceeded 1 million. Starting in August 2016, the hotel's attention has been flat, people want to know more about the Minshuku, but the content of the Minshuku is insignificant compared to the hotel. In recent years, the country has taken the Minshuku industry as an entry point for structural reforms in the agricultural supply side and has taken the Minshuku industry as a breakthrough point for the revitalization of the countryside, and constantly explore innovative development models. As of February 1, 2018, there have been 267 documents regarding the specifications and standards of Minshuku support policies. The intensive promulgation of regulations and standards shows the supportive attitude towards the development of the hotel and the guidance of industry standardization.

From a geographical point of view, the Yangtze River Delta and the eastern coastal areas are leading the Minshuku industry due to the maturity of the tourism and holiday market, including abundant water resources, ancient towns, and urban scenery. In the future, the Minshuku industry will continue to expand with the increase in passenger flow in popular tourist areas and the development of new tourism resources. At the same time, the Minshuku industry also carries the mission of protecting and inheriting vernacular architecture.

# 5.0 AT THIS STAGE, THE DEVELOPMENT OF THE MINSHUKU INDUSTRY BRINGS PROBLEMS TO THE PROTECTION AND INHERITANCE OF VERNACULAR ARCHITECTURE IN CHINA

## 5.1 The Excessive Development of Minshuku Industry has caused damage to the Value of Rural Buildings

First of all, we can be sure that the renovation and development of the Minshuku industry is indeed an effective protection for the local architecture, but its premise is to develop it "effectively" and "reasonably". Once the transformation is not "effective" and "reasonable", it will damage the value of vernacular architecture. This is a matter of degree. For example, to develop a local building into a Minshuku, a series of issues such as thermal insulation, sound insulation, moisture resistance, lighting, and ventilation must be solved first to meet the basic requirements of living comfort. The necessary modernization is inevitable. The owner of a business or Minshuku simply demolished and built a large building, blindly pursuing modernity, causing serious damage to vernacular architecture. How to find the meeting point of tradition and modernity, and grasp this degree is a problem in the development of the Minshuku industry.

#### 5.2 The Imperfect Policies and Specifications Related to the Protection of Rural Buildings

The imperfect system is another problem in the development of Minshuku industry in China. Relevant regulations are not complete, resulting in a lack of legitimacy and security of the Minshuku industry in many regions. Minshuku operations must obtain relevant government documents and meet public security and fire protection requirements. Half of the country's provinces have successively introduced Minshuku support policies, but their implementation has not been effective. For example, Zhejiang Province issued the "Interim Regulations on Public Order Management in Zhejiang Province's Minshuku" in 2016. One year later, the problem of low permits for special industry licenses still exists, and the provincial licensing rate is less than 5%.

At the same time, because there are no relevant restrictive policies and regulations for the reconstruction of vernacular buildings, the owner of the Minshuku often dismantles and renovates the vernacular buildings at will, which not only results in the destruction of the buildings, but also leads to the serious homogeneity of the Minshuku industry. Not only did it not play a role in protecting and using rural buildings, it played a reverse role.

## 5.3 The Lack of Cultural Confidence and Development Confidence of Minshuku Owner in Vernacular Architecture

The contradiction between protection and renovation in the development of Minshuku, many times the owners of the Minshuku completely require those "old houses" based on the standards of modern city houses and star hotels. In their view, the most basic prerequisite for attracting "urban people" is a modern living space. They believe that no one will come to live in a space with incomplete infrastructure. However, in some local architectural heritage, the infrastructure is too perfect, but the "original flavor" of the building is lost, which greatly reduces the sense of experience. This also reflects, to a certain extent, the quality of the staff in the Minshuku industry is uneven, and the problem of overall quality. Although some have a higher education, a new theme and new ideas, they are mostly operated by villagers around the scenic spot. By. Such operators often lack business thinking and cultural connotation.

## 6.0 RELECTION AND SUGGESTIONS

## 6.1 Maximize the Original Features of Vernacular Architecture

How to increase the needs of modern life without excessiveness in the reconstruction of vernacular buildings, I think we should promote the "New wine in old bottles" transformation method, that is, local reconstruction of vernacular buildings. Before the transformation, find the elements that reflect the unique value of specific local buildings. These elements include both the characteristics of the era and the characteristics of the region and national culture. For example, elements with spatial characteristics of the Ming, Qing or other periods in the space, such as elements of regional characteristics such as cave structures in the Loess Plateau, or elements of minority characteristics such as the Dai and Yi nationalities, are preserved during the transformation On the basis of these factors, the space transformation required for modern life is "effective" and "reasonable" development.

The Minshuku in Hangzhou, Zhejiang have been developing rapidly in China, while the Moganshan Minshuku is the first resort in Jiangsu and Zhejiang. Even now, Moganshan has become synonymous with Minshuku.

Among them, the remodeling design of "Sanqiu Meisu", one of Moganshan's more popular homestays, has a good grasp of the degree between modern life needs and the characteristics of vernacular architecture. There are three houses in Sanqiu Meisu built on the mountain, stepped from bottom to top, and the house is surrounded by a bamboo forest. The building retains the original wooden roof trusses and pillars, and the internal details reflect local characteristics everywhere. For example, the stair railings are made of local bamboo materials. The entire transformation not only meets the needs of modern life, but also retains the traditional wooden structure of the building.



Figure 1 outdoor scenery in "sanqiu beauty hotel" Figure 2 Indoor staircase of "sanqiu beauty hotel"



Figure 3 "sanqiu beauty hotel" room Figure 4 "sanqiu beauty hotel" hall (Source: wecht Official Account, tianyuanzhi, 2019,38)

Another example is the "Phoenix measure" on the edge of the city in Rizhao City, Shandong Province. The original name was Dujiaping. The old house was abandoned due to urbanization. This is also a dilemma faced by many vernacular buildings in China. The builder once said, "We dare not touch the old house easily. If we cannot keep the soul of the old house, we are sinners." Therefore, we can see that whether it was the original environment of the tree or the stone used to build the house, all of them have been preserved one by one. These elements that mark the unique value of the local architecture here are retained, so that the converted bed and breakfast is still with very obvious regional characteristics.



Figure 5 " "fenghuang cuo" (Source: wecht Official Account,minsuzhan, 2017)

## 6.2 Formulate and Improve Relevant Policies and Regulations, and Strengthen Supervision.

To formulate relevant norms and measures conducive to the protection and utilization of vernacular buildings, experts and scholars are required to determine the "bottom line" of vernacular building renovation in the development of Minshuku industry on the basis of in-depth investigation and scientific demonstration according to the actual situation of the region and local characteristics of different regions. At the same time, community and village supervision teams can be established to ensure the effective implementation of relevant policies and regulations. In this regard, we can refer to the development of Taiwan's guesthouse industry. The management and guidance of Taiwan's Minshuku in the early stages of development were carried out by the Minshuku association. In the process, the association actively communicated with government departments, promoted the formulation of relevant regulations and helped improve the rationality of regulations. In the later period, the functions of the Minshuku association gradually turned to the marketing of Minshuku, and played an important role in promoting local Minshuku.

## 6.3 Increase the Propaganda of Cultural Confidence

On the one hand, under the control of the local government, do a good job of environmental protection and publicity. Through a variety of publicity and education methods, establish the cultural and developmental confidence of the villagers, make full use of local customs, and attract tourists by creating a variety of immersive experiences, create a homestay industry with local characteristics. On the other hand, you can rely on local tourism colleges or related colleges and universities to conduct comprehensive training from theory to practice, not only to improve their awareness of service, but also to improve their vision and business philosophy.

For example, Shirakawago, is one of the most famous ancient village tourist destinations in Japan, and many traditional "hand-built" folk houses here have been developed into Minshuku. Most of these Minshuku only introduced basic kitchen and bathroom facilities during the renovation process, while retaining the original pattern and furnishings to the greatest extent. Authentic tatami is still used in the room, and the rooms are separated only by traditional wall-mounted paper fans; diesel heating is used for heating at night; toilets and

showers are public; however, this seemingly rudimentary condition has not weakened the enthusiasm of tourists According to statistics, in 2015 alone foreign tourists stayed in Shirakawago to 28,000 people. From the case, we can think that-for a Minshuku with local characteristics and deep historical and cultural heritage, as long as basic health and safety are guaranteed, there is no difference in modern convenience from the convenience of living. It really weakens its charm.

#### 7.0 CONCLUSION

In this paper, the protection and inheritance of the Minshuku industry and local architecture are linked. The beneficial effects of the Minshuku industry on the protection and inheritance of the local architecture are analyzed, as well as the problems that arise in the current development process, and several suggestions are proposed. Through analysis, we can be sure that as long as the reasonable transformation and development, the development of the guesthouse industry can indeed play a positive role in the protection and inheritance of rural buildings. It is hoped that the development of the Minshuku industry can adhere to the original intention of providing tourists with the experience of local nature, culture, production and lifestyle, and not blindly pursue high-end, creativity, scale, and chain, thus becoming a bright avenue for the protection and inheritance of rural buildings.

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## CHALLENGE AND PRESERVATION OF OPEN SPACE IN BALI: A CASE STUDY OF GREEN OPEN SPACE IN WONGAYA GEDE TRADITIONAL VILLAGE, TABANAN REGENCY

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Abstract: Three realms in Balinese village: temples, housing, and green/open spaces are essential features in acquiring their settlement identity. These realms derived from their philosophy in terms of resulting in harmonious relationship with God, humans, and the environment. According to their belief, every realm should be demarked by open/green space, and also used as barrier one village to another. However, the presence of green open spaces is being increasingly jeopardised as a result of the impacts of commercial use and tourism. Therefore, through a case study at Wongaya Gede Village, it is a way to highlight their presence in the future

Keywords: Co-Creation, Community Engagement, Housing Design

#### **1.0 INTRODUCTION**

Bali is just a tiny island as part of Indonesia archipelago located between Java and Lombok Island. Bali itself has a specific culture compared to other cultures in Indonesia which are still living. Their culture derived from Hindu culture besides in combination with local genius. And their beliefs have taught them to maintain well their culture, traditions, and customs although the Balinese life constitutes Hindu enclave in the dominance of Moslem society in Indonesia. In order to maintain their existence, they have secured their culture, traditions, and customs according to their belief. The rich of philosophy as guidance of life has been practiced throughout their life. According to Suteja (2012), the philosophy of three harmonious relationships (called *tri hita karana*) between humans, God, and environment is a fundamental belief to arrange their life including in arranging their settlement. The presence of temples, housing and green open spaces in Balinese villages constitutes the implementation of the three harmonious relationships.

The three kinds of space in the village are arranged based on their philosophy; three village temples as a symbol of birth, life and death are placed at north/east, middle and south/west. Cemetery to utilise the village community is part of the death temple called as Pura Dalem which is located at end of south/west side of the village. Other facilities such as market, public space or village hall are at centre. Whilst green open spaces are functioned as boundary among dwellings, a barrier of the village territory, and boundary among villages. The important role of green open spaces in the Balinese village can also be used as signage for guests who enter and pass through the Balinese village. As a result, their settlement/village has had a strong identity which is able to be categorised as a unique thing in an urban context.

However, the presence of the village's uniqueness and identity particularly green open spaces is being increasingly jeopardised due to the impacts of commercial use and tourism in this island. Today, the development of Bali tourism is not concentrated in specific areas, but it spreads in many areas that are regarded as potential to be developed as tourist sites. Although the local government has set out regulations into spatial planning (RTRW No.16/2009) stipulating that it is only 16 locations permitted to be developed as tourist sites whereby 14 locations are at coastal areas and two others at villages, the government seems not able to stop the extensive development of the tourist sites in other places. Village leaders with their own initiative or joint with other parties sometimes develop tourist destination in their villages without backed up by planning. As a consequence, some green open spaces as boundaries in the village.

Wongaya Gede Village as a case study in this research is an old village as one of the Balinese traditional villages in this region which was predicted to be established around the 11<sup>th</sup> century. This village is part of

Tabanan Regency, located at the slope of Mount Batukaru whereby Batukaru Temple as the second biggest temple in Bali is also located at the slope. Its location is the north side of the village or closer to the mountain which can be seen at the figure below. The distance between the temple and village is approximately 5 km, whilst the distance of Wongaya Gede Village with Tengkudak Village at the South is more and less than 0.75 km. These distances are regulated according to the Balinese beliefs, traditions and regulations and these spaces must be planted into plantation as green open spaces or the other word becomes prohibited areas. Based on this village pattern concept, the development of the built environment as dwellings and other facilities must be developed towards the east and west sides. On the other hand, the development of building facilities in the prohibited areas was inevitable to take place. It indicates that the Balinese culture, traditions and custom law in this village has begun to gradually decrease in maintaining their territory. If there is no significant effort to stop building offenses in this area, one of the Balinese identities in the future will be loss. The research objective, therefore, is to investigate the presence of green open space in this village.

#### 2.0 MATERIAL AND METHODS

Since the main focus of the research is open space as green open space, there are several terms in categorising this space, such as open space, green space or open green space which are really required to be explained. According to Doyle (2012) and Patrick (2008), the definition of open space is not only articulated as land but also is water bodies such as lakes, canals, reservoirs, rivers, sea, and sand beaches which improves visual amenities beside opportunities for recreation and sport. Wang & Gao (2012) state that open space is possibly occupied with buildings, but it should be less than 5%, hence it may be used for a variety of human activities or in combination activities (Clawson, 2018). Besides that, Olsson (2012) adds that open space is essential for people to improve their health and environmental quality of their surroundings. Whilst the term green space is open space consisting of any vegetated land, water, structure or geological features in a given area (Campbell, 2001), and mainly found in combination between artificial and natural areas (Chi Yung Jim & Chen, 2003). In addition, Fam *et al.* (2008) and Mensah (2014) said that all public and private open spaces in urban area are mostly covered by plants such as grasses, shrubs, and trees that are available for various functions and uses. From both space definitions, green open space, therefore, can be defined and simplified as open space that are mostly covered by plants, and key social and environmental infrastructure for a sustainable area (Ives *et al.* 2014).

In the local context of Bali, space according to Herman Schmitz in Michaels (2004), is that something does not perceive it in any specific volumetric or qualitative sense, but rather identifies spatial divisions in terms of thresholds and liminal zones. From religious thought of Hinduism, the term space is similar to cosmos/sphere/realm that must assume in some degree a sphere of existence encompassing not only gods, humans and environment, but also all animated life: animals, plants, water, fire, wind, language, meters, feelings, and thoughts (Michaels, 2004). Whilst the term cosmos in the local context, is commonly called as loka/bhuwana meaning the sphere of existence as a specifically religious concept of place (Sutjaja, 2009; Sularto, 1987). In order to arrange the Balinese settlement especially their village in that time (around the 11<sup>th</sup> century), they mainly used linier pattern according to 'north-south axis'. This axis derived from their belief and philosophy whereby the axis constitutes a symbol of mountain-sea or kaja-kelod, and the axis became the village's main access (Ngurah, 2017). From this point, three village temples (Puseh, Desa/Bale Agung and Dalem Temples) as one of the Balinese identities are the main priority to be placed in the village area. Puseh Temple as birth temple is located at north side, Desa Temple as life temple in the middle, and Dalem Temple with its cemetery as death temple is located at end of village's south side (Ardana, 2000). Other places; housing, market, public hall, open spaces are placed between the birth and death temples. Meanwhile, green open space beyond their settlement becomes boundaries/village demarcation, from one to another.

In order to specify problems, Wongaya Gede Village at Tabanan Regency was selected as a case study in this research with several reasons, such as 1) this village is one of the traditional villages located at the slope of Mount Batukaru which is predicted that was existed before Majapahit Era or before the year of 1343 (Wikarman, 1997); 2) the location is too far from the concentration of tourists (approximately 35 km from

Tanah Lot/70 km from Kuta Beach); 3) Less impact of tourism; and 4) one of the barometers to measure the presence of open spaces. The study uses a qualitative method with a phenomenological approach in which it intended to understand the phenomenon of the open space conversion to be built environment in the village. This research begins by reconstructing or drawing back data related to the development of land use. The description of the development of the use was compiled based on information obtained through interviews with selected people who were village leaders, religious leaders, and land users, which were determined by purposive sampling technique. Therefore, the research question proposed is to what extent the changes of green open space in this village after influenced by several factors which were based on field survey.

#### 3.0 RESULTS AND DISCUSSION

The section is practically divided into two subsections whereby those are results and discussion. Data and information collected into field survey were presented to support analysis, whilst the discussion was carried out according to the data into the descriptive analysis.

#### 3.1 Results

As a case study, the topography of Wongaya Gede Village is approximately 700 m above sea level in which its location is close to Mount Batukaru (2,276m) as the second-highest mount in the island. The tropical climate of the village has an average annual temperature is around 22.6°C; it has also a significant amount of rainfall during the year even for the driest month whereby it is 2391 mm average. Due to its location in the mountain slope and the climate, the village has fertilised areas consisting of rain tropical forest, rice fields, plantation, and other green fields (Statistics Board of Tabanan Regency, 2017). Meanwhile, with 30.23 km<sup>2</sup> of total area, the village is predicted as the largest village territory in the regency even on the island. Land use of the village territory in 2017, was dominated by open green spaces (tropical forest, plantation, rice field, and other green spaces) with 97.62% of total, whereas the built environment consisting of housing, accommodation, public buildings, temples, shops & restaurant, streets, and others) only reached 2.38% of total area of the village (**Table 1**). It gives evidence that the village has been surrounded by green open spaces.

No	Description	Green open space (Hectare)	Non green space (Hectare)
1	Plantation (coffee, clove, cocoa, coconut, and others)	396.18	
2	Rice field	618.00	
3	Tropical forest	2,170.81	
4	Village/public temples		25.80
5	Public buildings		2.79
6	Housing		31.57
7	Accommodation		5.65
8	Shops/restaurant		0.59
9	Street		8.61
	Total	3,154.99 (97.62%)	75.01 (2.38%)

Table 1: Land Use of Wongaya Gede Village Territory (Source: Statistics Board of Tabanan Regency, 2017)

Meanwhile, the number of populations in the village recorded in 2010 and 2016 is 2,669 and 3,524 respectively, which means that the population growth of the village achieved 5.34% per year. Due to the large area, so that people density in 2016 was only 117 km<sup>2</sup>. Furthermore, the number of the population according to their religion in 2016 was almost all Hindu as local genuine, other religion was only 0.17%. From this sense, most decisions relating to the development of culture were emphasised on the majority of the local community deriving from culture, traditions, and custom law of Hindu. Hence, the implementation of their culture, tradition and customs has become part of their everyday life.



Figure 11: Village location and green open space zones at the north and south sides of the village

Even though the village territory was dominated by green open spaces which were more than 90%, there were several evidence contravening their traditions that emerged in the last 20 years. Since then, the development of physical buildings such as housing, villa, tourist accommodation have been built in the prohibited areas. Even tourist facilities built in the village was located at the north side which is part of a more sacred zone rather than the south side of the village. In addition, the prohibited areas/green open spaces at the south side of the village were built some dwellings and home industries owned by local people. Whilst development of dwellings and other facilities at the west and east sides has continually grown (Figure 1). Statistically, the number of private and commercial facilities recently developed in this village does not cause anxiety in the impact of this development if compared to the large area of green open spaces in the village. These problems in the village development, therefore, will be the main discussion in the next step in order to find possible solutions.

#### 3.2 DISCUSSION

Challenges and preservation on the presence of green open spaces at Wongaya Gede Villages seem to really depend on influencing internal and external aspects that are the same as weaknesses and strengths. In order to address these points, the discussion can be classified into three aspects such as contemporary challenges, and preservation opportunities.

#### a. Contemporary challenges

Contemporary challenges in relation to the presence of green open spaces, it can be observed from the impacts of tourism since Bali was proclaimed as centre of tourist destination in Indonesia in the early 1970s. The impacts are not only on social culture, economy, and politics but also on the environment. Tourism has established to become the world largest industry or global industry in which globalisation is the driving factor of tourism. Kuta, Sanur, Nusa Dua, for instance, are three coastal tourist resorts that are very famous as a tourist destination in this region. They are located at the southern part of the island which is more than 60 km from Wongaya Gede Village. Due to the increasing growth of tourist arrivals to Bali, tourist locations have expanded to other places without stopping, such as Tanah Lot (Tabanan Regency), Candi Dasa (Karangasem Regency) and Lovina (Buleleng Regency). From coastal resorts to tourism villages have increasingly grown in order to acquire benefits from tourism sector. Some Balinese villages seem to compete with one another

promoting their village to foreign tourists. One village influencing Wongaya Gede Village to be tourist destination area is likely Jatiluwih Village as one of the world culture heritage, whereby it is located at the eastern side of Wongaya Gede Village. Although this village as the heritage site which means that its area should be conserved well, it actually developed into a tourist area; this is because of the number of tourist visits. And even though both villages are located in conservation areas, they could not be stopped becoming tourist destination areas completed by the development of tourist facilities since in the year of 2000.

The local government of Tabanan Regency as policymakers seems not ready to maintain well Wongaya Gede village as a conservation area. It can be seen from the preparation of regulations that they have. In fact, they do not have any regulations to secure the conservation area. After 12 years from the beginning of land conversion to take place, the government only have Tabanan Regency Spatial Planning set out into a regulation No.11/2012 which was officially declared on 12<sup>th</sup> December 2012. Whilst land use and zone planning to manage both villages and their territories are in progress to complete the regulations this year. This action has been taken after several issues on land conversion to take place. Even though the conversion of land to be tourist facilities at Wongaya Gede Village was only 5.65 ha or 0.17% of the total area (see table above), it is an alarm for the government to be more careful from this contemporary challenge. Moreover, due to the unavailability of local regulations, conflict of interest among village members has begun to appear, especially between parties who want to preserve and not for the conservation of protected areas. Political will from the government seem not sufficient to manage the village and community. From these issues, it proves that they may have weak management to control and monitor their territory.

#### b. Preservation opportunities

Because of lack of protection, some obstacles in the conservation of green open spaces in the village will lead less opportunity to protect these spaces in the future, otherwise, a set of government regulations, improvement of management, and significant supports from the community are available implemented into real actions. Nevertheless, tourism and globalisation seem to strongly influence the village community's belief and thought in which an economically beneficial passage constitutes a way to survive in modern life. Meanwhile, their life in modern society has also changed their lifestyle in which they are keen on having a similarity to urban society. As mentioned above, conflict of interest among the village community with less regulation particularly in control and monitoring on the protected area, will also new issues in the conservation. Actually, there is an opportunity to conserve the green open spaces in the village based on a complete custom law are available (Surpha, 2012; Purwita, 1984). According to the laws deriving from Balinese Traditional Architecture stipulating that the north side of the village settlement is protected, or sacred areas (non-developed area) and the south side is green open spaces as an identity of the Balinese village. These laws were expected to be useful to unite the community and to minimise the conversion of the land, unfortunately, it seems ineffective. In this point of view, this indicates that there is little neglect of the custom laws conducted by the village community. Hence, the change of their lifestyle as part of their culture has been one of the key factors to change their physical surroundings.

The consciousness of stakeholders who involves in the development of Wongaya Gede Village is required to open a chance in the preservation of the green open spaces. They are a key factor to change or conserve the area as the conversion of the land took place due to the different interest of the community members and most owners of tourist facilities in the village are themselves. In addition, the population growth with 5.34% per year showing very high is also one of the threats in preservation possibilities of the green open spaces. So, the possibilities to solve the issues and problems are the stakeholders who mainly come from the village community members as environment supports, local government as policymakers, and from private companies/investors. By providing well relationship into coordination among the parties, it enables to secure the village's protected areas. In contrast, unconsciousness of the stakeholders will accelerate the conversion of green open spaces to take place in the village. Based on the recent situation in the village, therefore, there are two options for the stakeholders to be chosen i.e. 1) carry out preservation with less economic benefits, and 2) without preservation for taking full advantages in tourism activities.

#### 4.0 CONCLUSION

From the description of the discussion, a conclusion can be provided, as follows:

There is only little chance to secure the protected areas in the village since the local government of Tabanan Regency has not provided yet land use planning and regulations, whilst the custom laws owned by the village members including Balinese traditional architecture was ineffective to be applied. The risk in this matter is the conversion of land taking the green open spaces as the protected areas will continually take place. The negative impacts of the significant decrease from the availability of the green open spaces are not only to degrade the quality of their surroundings but also the communities beyond the village will also feel the degradation of the environment when they go for praying to the second largest temple in Bali (Batukaru Temple) through this village.

Since the key role of the government to manage their territory is decisive, the government regulations followed by tight control and monitoring seems to be prerequisite to manage the green open spaces at Wongaya Gede Village. Coordination into well relationship among stakeholder (government, village members and private companies is another prerequisite to solve the issues and problems. These strategies are likely to open the chance of land preservation. Meanwhile, to handle the increasing growth of population and the number of tourist coming to the village, it can be done through regulations such as 1) to expand the village settlement due to population growth, it can be expanded to the east and west sides of the village territory and 2) to stop the development of tourist accommodation, it can be developed tourist facilities for visit only, such as rest areas, by cycling, horse riding, permaculture, and other tourist attractions.

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## EXPLORATORIUM: A POTENTIAL DESIGN SOLUTION FOR THE CONSERVATION OF TROPICAL RAINFOREST

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**Abstract:** Forest plays a significant role in maintaining the balance cycle of our ecosystem. It consists of rich biodiversity, which is not only for animals and plants, but also a place for humans to explore and benefit from its resources; such as timber, water, herbs, gold, and oil. The rainforest in Malaysia is believed to be the oldest and has the most biologically diverse forests in the world. However, the Malaysian rainforest is now in danger of disappearing due to deforestation. Thence, there is a need to have an architectural solution to protect the natives' economic resource and cultural identity. This research has the objectives to examine the problem of deforestation and to explore the potential of architectural design in solving the rainforest conservation issues. This research is conducted using qualitative approach, where data is collected by utilizing the methods of table-research and case study. The proposed architectural solution comes in the form of an *Exploratorium*, integrated with a research centre. This proposed facility, with its series of forest discovery spaces, would create awareness among the public on the significance of preserving the rainforest; encourage the public to experience the tropical rainforest ecosystem, and let the public to understand the culture of the native communities.

Keywords: Deforestation, Sustainability, SDG 15, Life on Land, Natural Ecosystem, Exploratorium.

#### **1.0 INTRODUCTION**

Forest plays a significant role in maintaining the balance cycle of our ecosystem. It consists of rich biodiversity, which is not only for animals and plants, but also a place for humans to explore and benefit from its resources; such as timber, water, herbs, gold, and oil. The rainforest in Malaysia is believed to be the oldest and has the most biologically diverse forests in the world. Islam upholds high the perspective towards other creatures (nature). Allah S.W.T says in the Holy Quran:

"And it is He who spread the Earth and made in it firm mountains and rivers, and of all fruits, he has made in it two kinds; He makes the night cover the day; most surely there are signs in this for a people who reflect" [Al-Quran, 13:3].

Excessive human activities cause deforestation, and it is considered the most significant threat that harms the forest and its ecosystem. Deforestation is also known to destruct the existing animal habitat and contribute to the rise of global warming and climate change. Due to the uncontrolled deforestation, the native communities who live in the Malaysian rainforest have also lost their source of income, as well as their cultural identity. Due to the current deforestation problem, there is a need to have an architectural solution to protect the rainforest, the natives' economic resource, and the cultural identity of the place. Thence, this research has the objectives to examine the problem of deforestation and to explore the potential of architectural design in solving the rainforest conservation issues. This research is conducted using qualitative approach, where data is collected by utilizing the methods of table-research and case study.

#### 1.1 Research Background

#### **Global Deforestation**

Rapid globalization throughout the world had caused the demand for forest products increasingly. By the time, it creates massive deforestation by clearing and cutting down trees. According to Sarawak Forestry Cooperation, deforestation is the removal of a forest or stand of trees from the land which is then converted to a non-forest use. Deforestation also can be done in several ways such as logging, mining, and others. It occurs around the world, though tropical rainforests are particularly targeted due to its rich sources.

#### Deforestation in Malaysia

World Wildlife Foundation (Cesareo, 2020) stated that Malaysia had been the world's highest rate of forest loss between the year 2000 and 2010. The forest loss during the period amounted in the year 2000 is about 14.4%. The loss was configured to have up to 47,278 km<sup>2</sup> which are equivalent to an area of Denmark. Due to that factor, in the year 2005, the Government of Malaysia had signed an agreement called the Paris Agreement to maintain the forest cover at least 50% to have a sustainable environment. Currently, the total forest cover (Butler, 2020).

#### Deforestation in Sarawak

Focusing on the rainforest jungle in Sarawak, it faces the highest loss of trees due to the rapid deforestation. According to Sarawak Forestry Corporation, 1.2 million m<sup>3</sup> of rainforest timber was cut throughout the Sarawak jungle. 80% of the rainforest of the Malaysian Borneo have been heavily impacted by logging (Butler, 2020a). 40% of the logged rainforest timber was imported to Japan (Hays, 2020). Hence, this situation will keep worsening if there is no alternative or solution to change this scenario as it affected the ecosystem.

#### Bidayuh: The Native Tribe

The Bidayuh people are believed to be true indigenous inhabitants of Borneo, despite the origin of the Bidayuhs in Sarawak is uncertain and unknown, as many depend on legends and oral traditions of how they came thus it is difficult to prove its accuracy. Their cultures and architectural knowhows may be a result of long cultural exchange and improvements, as according to, the vernacular process of design, procurement, and implementation in building construction of the indigenous community in Sarawak (Idrawani, 2018).

#### 2.0 RESEARCH METHODOLOGY

The objective of this research is to examine the problem of deforestation and to explore the potential of architectural design in solving the rainforest conservation issues. This research is conducted using qualitative approach, where data is collected by utilizing the methods of table-research and case study.

For the case study, several research endeavours have been undertaken to analyse case studies, that would lead to the generation of spatial requirement for the Exploratorium. The proposed Exploratorium would have facilities that reflect the culture of the place, such as interactive galleries, tree-houses, travel pods, and watching towers. In short, designing the Exploratorium reconnects the division between humans and nature, and simultaneously produces a sustainable community and environment.

#### **3.0 RESEARCH ANALYSIS**

The finding discussed in this section is based on case study. Several case studies had been conducted as a method to obtain both primary and secondary data. This method of research is recognized by Press Academia (2018), where case study is defined as an in-depth investigation which relies on multiple sources of evidence and benefits from the prior development and theoretical propositions. The units of case study for the exploration of the potential architectural design solution are chosen based on the facilities provided.

## The Architectural Case Studies

Architectural case studies for this research are selected based on their relationship to the objectives of the research. Several criteria for architectural design are analysed, as shown in Table 1. The case studies are also examined to generate the spatial requirement for the proposed "Exploratorium". with the potential of architectural design solution to solve the rainforest conservation issues.

	I able 1: Criteria of the Case Studies				
	Criteria	Category			
1	Education	i) Formal ii) Informal			
2	Target User	i) Public ii) Private			
3	Material	<ul><li>i) Conventional</li><li>ii) Unconventional</li></ul>			
4	Spaces	i) Indoor ii) Outdoor			

Tab	le 1	:	Criteri	a of	the	Case	Studi	es

The first case study is a Sustainable Treehouse, located in West Virginia, the United States. The Sustainable Treehouse, as shown in Figure 1, settles in the rural area of West Virginia rainforest. It serves as an educational and gathering space for exploring and understanding the forest ecosystem, tree canopy, and sky. Then, the second case study is Pulau Banding Research Center, which located at Belum Rainforest, Perak, Malaysia. This building acts as a research center for the researcher and academician to study and do research on the Royal Belum Forest. The image of Pulau Banding Research Center is shown in Figure 2. The third case study is Evans Treehouse, shown in Figure 3. This facility is located in a recreational forest of Evans Garden, United States. This building act as a place for children to explore and learn about nature.



**Figure 1: Sustainable** Treehouse

**Figure 2: Pulau Banding Research Center** 

**Figure 3: Evans Treehouse** 

## **4.0 Research Findings**

In general, all the building selected for the case studies are built for educational and learning purpose. Table 2 shows the analysis and synthesis of the case studies.

Table 2: Analysis and Synthesis of the Case Studies						
	Sustainable Treehouse ( <i>Case Study 1</i> )	Pulau Banding Rainforest Research Center ( <i>Case Study 2</i> )	Evans Treehouse (Case Study 3)			
Location	West Virginia, United States	Belum Forest, Perak	Woodlands Garden, United States			
Typology	Education	Education	Education			
Type of Education	Informal, interactive and interpretive (climbing, exploration, contemplation, observation) Learn about the water cycle and strategies and conserve the resources. Forest knowledge.	Formal. Sampling method.	Informal learning (forest, insects, and creeks) Interactive educational experience (climbing, running, viewing)			
Target user	Public (youth)	Researcher and biologist	Public (children)			
Materials and structure	Corten Steel and timber cladding	Post and beam. Pre-cast concrete and Timber cladding	Steel frame and glue-laminated timber.			
Spaces						
Entrance	Yes	Yes	Yes			
Indoor gallery	Yes	No	Yes			
Outdoor gallery	Yes	No	Yes			
Viewing deck	Yes	No	Yes			
Laboratory	No	Yes	No			
Accommodation	No	Yes	No			
Classes	Yes	No	No			
Synthesis	Provide other exciting programs close to nature such as gardening herb or planting trees.	Implement sustainable design and approach in order to produce own energy.	Implement sustainable design and approach in order to achieve a green building.			

Based on the analysis, it is found that Sustainable Treehouse and Evans Treehouse used informal, interactive and explorative educational techniques, while Pulau Banding Research Center focuses more on formal technique. In terms of the target user, Case Study 1 and 3 are open to the public especially to the youth and children, while Case Study 2 mainly open for researchers and academicians only. Thence, it is synthesized that all the three case studies provide the educational facilities to generate awareness of implementing sustainable approaches programs, such as renewable energy knowledge and green building methods.

## **5.0 DESIGN EXPLORATION**

Design exploration of the proposed architectural project: the Exploratorium, is done based on the research finding discussed in section 4.0. The Proposed Exploratorium is named as <u>Sarawak Rainforest Exploratorium</u> <u>and Research Center (SReC)</u>. In order to explore the design solution for this project, several design approaches are outlined. Table 3 shows the design approaches in graphic forms, together with their descriptions.



Table 3:	Design	Approach	of Ex	ploratorium
1 4010 01	Design	reperonen	OI LA	pioratorian

This project is proposed to be located at Kubah National Park, Kuching, Sarawak, Malaysia. This park is a highly dense rainforest reserve, and partly occupied by the Bidayuh people. The Bidayuh people is one of the affected indigenous tribes, whose cultural heritage is affected by the problem of deforestation. Hence, the Bidayuh people is the main target users of the proposed facilities, besides the youth, children and tourists. Figure 4 shows the proposed master plan of the *Sarawak Rainforest Exploratorium and Research Center*.


## Figure 4 : Masterplan of SreC

The design of the proposed Exploratorium has eventually realised and shown in Table 5: with embedded Figure 5, 6 and 7.

Table 5: Activities and Programs on SreC			
Proposed Exploratorium Design	Description		
Figure 5: The entrance of the Exploratorium	<ul> <li>Humbly nestled on the foothill of Mount Merapi.</li> <li>Built on stilt to minimize the building footprint.</li> <li>Act as the main entrance of the Exploratorium which serves with interactive galleries, 'orang asli' workshop, laboratory and vertical farming area.</li> <li>Materials were made from timber, steel, and concrete to reflect the surrounding area and culture.</li> </ul>		
Figure 5: Firest walk at the Exploratorium	<ul> <li>Several treehouses which connected through travel pod mechanisms.</li> <li>Forest walk through the traditional Bidayuh's Bridge.</li> <li>Learn more about forest knowledge thought by Bidayuh's people.</li> <li>Bird watching.</li> <li>Flora and fauna.</li> </ul>		
Figure 7: Exploratorium, blended with nature	<ul> <li>Great place for learning and researching nature.</li> <li>Explore and experience the calmness of nature along the forest path.</li> <li>Guided by the forest ranger which is from the Bidayuh's people.</li> </ul>		

# 6.0 CONCLUSION

In conclusion, there are many benefits and advantages of having this rainforest Exploratorium. Having the Exploratorium is deemed necessary, as the the best approach to educate the public on the awareness of preserving the rainforest. The facility encourages the public to experience the tropical rainforest ecosystem and let the public to understand the culture of the native communities. Sustainable communities and development can be achieved as it provides a sustainable job opportunity for the natives without destroying the forest ecosystem. The Exploratorium reconnects the division between humans and nature, and simultaneously produces a sustainable community and environment.

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# UNDERSTANDING THE CULTURE OF BUILDING; THE OUTBACK MOSQUES IN AUSTRALIA IN THE LATE 19<sup>th</sup> CENTURIES

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**Abstract:** The first groups of Muslims arrived in Australia in the late 19<sup>th</sup> centuries. They are the camel drivers from north-western part of British India, popularly known as Afghan cameleers. Although living in an alienated environment, they never forgot the customs and religious traditions of their homelands. However, the camaraderie that Islam bestows upon Muslims was absent in their early years in outback Australia. There were no mosques to provide a sense of belonging. Daily prayers were performed in the desert or empty bushland. With the increasing number of early Australian Muslims, the need to build their own mosques was felt overwhelmingly. The mud and tin-roofed mosques in the remote areas of Australia were the early instances of creating a place that concretised the sense of belonging for this small and isolated group along with the formation of the Ghan towns. These architecture in its modest sense are the true representation of the process of hybridization that combines different modes of building traditions, both internal and external. This paper will investigate into this culture of building in the remote outback for building the mosques as a conscious attempt of assimilation to the Australian society. It will look into three particular cases in Marree, Leonara and Cloncurry to discern different historic layers, construction methods, tectonics and materials to understand the culture of building in apparently rural and remote outback communities in Australia.

Keywords: Culture of Building, Mosque, Hybridity, Outback Australia

#### **1.0 INTRODUCTION**

Afghan Camel drivers, popularly known as the 'Cameleers' were brought to Australia as indentured labour in the 19th centuries. They have played a significant role in the European discovery, exploration and economic activities and settlements of Australia's vast desert interior and the western coast in the late 19th and early 20th centuries (Jones 2007). Though commonly knowns as 'Afghan' these cameleers were basically people from different tribes from Northwestern Pakistan and Northern India, and were predominantly practicing Sunni Muslim. According to their contract they were generally not meant to stay, to put down roots, or lead normal family lives. When their contracts ended, they were supposed to leave. Some did, but others remained mostly marrying local aboriginal or lower-class European women and often clinging to the margins of society (Stevens 2002). Quietly but indelibly these peripatetic minor Muslim communities also constructed their own places and dwelling spaces within this harsh landscape and made it home. Though in their early years in outback Australia, daily prayers were performed in the desert or empty bushland due their itinerant nature of work. With the increasing number of more settled population throughout the later decades a sense of camaraderie was developed and the need to build their own mosques was felt overwhelmingly. The mud and tin-roofed mosques dotted in the remote outback were early instances of creating a place that concretised the sense of belonging for this small and isolated group along with the formation of the Ghan towns.

'Architecture' (by which, I refer to the built environment and material culture in both the broadest and most modest terms) is the primary focus of the proposed research. Building has generally been regarded as one of the more fundamental acts of settlement (Scriver, 2004). The narrative of our built environment is centred on the understanding of human experience, memories, rituals, and social history that add meaning to architecture. Hence, the meaning of a building in the collective memory is intrinsically attached to the process by which it was produced and the manner it is experienced (Scriver et.al, 2016).

#### 2.0 CULTURE OF BUILDING

Understanding the contemporaneous culture of building of that apparently iterant group of people is important before we discuss the nature of architecture. The culture of building by definition is the coordinated system of knowledge, rules, procedure that is shared by people who participate in the building activity and that determines the form buildings and settlement takes. (Davis 1999). In a context, where the world is disclosed differently depending on the perspective taken and that many perspectives are necessary to get a whole and

complete understanding of the world, or even to fully grasp any particular occurrence, we need to discern all the layers that acts upon to shape the particular piece of architecture to cater all the levels of complexities around. It is apparent that these fragile and austere structures dotted in the outback Australia have failed to draw the attention of architectural historians as part of mainstream 'Mosque' architecture. The reason may be the increasingly inclusive scope of the surveys in this field. The current study offers a critical interpretation of the more transient traces of Islam in Australia, and their representation in the equally scanty tangible evidence. From the particular points of view of Architectural history, it would attempt to discern different historical layers that overlapped and infused together to shape the architecture of these mosques. However, the cases discussed here, and many others, are excluded from the historical record despite the instrumental role it played in the life of the early Muslim settlers in Australia (Bartsch 2015). This absence raises questions about gaps, or histories untold, as well as necessitate the need to examine hybridised forms and shared architectural narratives to counter the apparently myopic but persistent representation of supposedly authentic, largely Arabcentric, forms of 'Mosque' architecture. This paper argues, then, that new theoretical frameworks are required to interpret this architectural hybrid that is, we argue, typical rather than exceptional. Through these three case studies, this paper critically re-examines the reductive but pervasive conceptions of 'Mosque' Architecture that obscure the historical processes of culture of building and hybridization and its diverse morphological outcomes. It would further comprehend the process of resilience and assimilation through which architecture is shaped in a context.

## 3.0 CASE STUDIES: THREE MOSQUES IN AUSTRALIA

In this section three early mosques in three different parts of Australia will be examined to discern different historic and cultural layers that shape their Architecture. These are Marree Mosques (built in 1884) from South Australia, Leonara Mosque form Western Australia (Built between 1915-20) and Cloncurry Mosque (dated around 1910) in Queensland. The dates and locations of these mosques demonstrate the extent of cameleers' network during their half a century of operation in the remote Australian outback. As the camel business was declining 1920's, most of the cameleers either left the country or settled in some other places adopting new professions. Eventually all these transient traces of early Muslim settlers were abandoned and getting perished through time. Unfortunately, none of these mosques are surviving today due to the ephemeral nature of the construction and the harsh climatic conditions in the outback. This investigation was based on the old images of the mosque and records by the first hand witnesses found in the local archives.

## 3.1 Maree Mosque:

The mosque in Maree represents the earliest known mosque in Australia, built-in in ca. 1884 (Stevens, 2002). Between the years of 1870 to 1910, Marree (previously known as Hergott Spring) was the hub of Australia's camel business. Being one of important the railhead of the former Ghan railway network between Adelaide to Darwin, it attracted the cameleers to come and settle down, who used to provide supplies to different pastoral and mining communities in the remote inland. In its early days cameleers used to camp around near the camel paddock, which was 1.5 km north-west of the original town. The first mosque (figure 1), which is the topic of the paper, was built near this area. Later when Afghan population were gradually increasing and settled in eastern part of the railway track, a second mosques of corrugated iron and timber frame was built near the town. In 1962, the original mosque (1st) was relocated to the town centre as symbol of the town's past heritage.



Figure 1: Location of the Mosques (red dots) in Marree (Source: State Record Office, Adelaide)



# Figure 2: Marree Mosque (Source: B15341, State Library of South Australia)

As demonstrated through several old images at National Archives of Australia, this atypical mosque building is considered also as an exotic structure by the Europeans living in the towns and a place to visit during their evening strolls. In terms of architecture this building is much closer to a pavilion than proper mosque. It has close resemblance with the temporary shelter of the sessional labourer, who camped in the outskirt of Kabul (Kazimee and Mcquillan 2002). By examining the images found, the building clearly demonstrates three distinct layers of influence that distinguished it from other buildings around.

**1.** *The layer of the Home land:* The one metre high mud wall that determines the periphery of the building clearly demonstrate the connection with typical mud architecture of Northern India, Pakistan and Southern Afghanistan. Particularly the pavilion character and half mud wall, which is not a typical Australian way of construction has resemblance with traditional dwellings of the dry and arid region in India and Pakistan. The pavilion like structure is and presence of water body in front of the mosque is another response to the hot and dry climate that is commonly practiced in their homeland.

**2.** The layer of Outback: The building also resembles the typical outback practice of salvaging materials for construction. It is a common practice in outback Australia where materials are scarce and expensive due to the remoteness of the place. Everything is used and recycled as building materials, if possible, in such condition. In this case, a careful observation would reveal that the timber that is used to construct the superstructure are carefully milled into batten and planks that are usually used for packing boxes and pallets. The steps leading to the water body and the floor of the mosque were made of packing boxes as well. The makeshift characteristics of the super structure and the frame is basically a result of this practice of scavenging construction materials.

3. The layer of the Indigenous: The roof structure of the building closely refers to brush hut construction of the indigenous Australian. Due to their frequent travel to the remote areas the Afghan cameleers has close contact with the local indigenous people. Hence, they adopted lots of techniques of construction as well as survival from their aboriginal counterpart. As a result, it is not uncommon that they would adopt the indigenous way of constructing brush hut and windbreak in situation where reeds and thatches are unavailable.



Figure 3: Wiltja or Bush Dwelling Outback Australia Architect/Builder: Unknown ca. 1940 (Source: National Library of Australia)

# 3.2 Leonara Mosque:

Leonara is the hometown of the famous Gwalia gold mine in Western Australia. According the Leonara Shire Council library there was small Afghan settlement in the town. However most notable person was the Afghan priest (Imam) named Sonsa Din Rash Mohamed who had moved from Cloncurry to Bummers Creek few kilometres east of the town) after retirement and set up a market garden to serve the community. This garden was o e of the major the supplier of fresh vegetable in Leonara – Laverton region (Layman and Fitzgerald 2012). Rash Mohamed had also built a small mosque in his garden premise mainly to serve the family members and the workers of the farm. According to the images and witness's description the mosque was light structure with timber frame sheathed with woollen carpet with a corrugated iron roof.



Figure 4: Leonara Mosque (Source: Joan Harrison)

In its first appearance the structure resembles closely to the typical miners' hut in terms of its scale and formal expression. A closer scrutiny reveals a layer of domesticity evident in its materiality and tectonic. Though, it was a very common practice to use carpet as building materials for tent like structure for the semi nomadic tribes in Northern Pakistan and Afghanistan, the use of carpet as a walling material is a unique innovative solution to address the scarcity of building materials. It is also suitable for the dry and arid climate of the region. From that aspect this small building might provide an atypical example of Mosque architecture, but it is clearly the best possible response to the context and the constraints of that time.



Figure 5: Sonsa Din Rash Mahomet in his vegetable garden in Bummers Creek., 1 April, 1909. (Source: Local Historical Record, Leonora Shire Council)

# 3.3 Cloncurry Mosque:

Cloncurry is old copper mining settlement in central Queensland. The town was established in 1867. Cameleers and camels played a crucial role in the early days for the survival of the mines as it was the only means to tranship the loads from the mines to the nearest railheads. According to the historical records this network extends up to Burketown and Gulf of Carpathian towards north. Hence Cloncurry became one of the important hub of the cameleers and camel trade in this region. The Ghantown was eventually established at western side of the town along the Cloncurry River. A mosque was built in 1910 with corrugated iron and timber frame. Currently there was no trace available of the Ghantown or the mosques except the sole photographs surviving in the collection of Cloncurry Library (Figure 6).



Figure 6: Cloncurry Mosque (Source: Cloncurry Library)

The only surviving image of the mosque provides vivid description of the architectural characteristics of the mosque. The structure was built in atypical 'Queenslander' manner on pilotis to facilitate the stack effect for ventilation and most importantly to protect building from flooding (figure 7). The large veranda in front is typical to the traditional dwelling of this region. he use of timber frame and corrugated iron is very common practice in vernacular dwellings in Queensland. The noticeable feature of the building is the large water tank to collect rainwater is also a response to climatic condition of the region. The only distinguishable feature that identifies this building as mosque is the small Mihrab (niche) in the direction of Qibla. The more permanent appearance of the structure reflects the more settled and financially stable position of the Muslim community in Cloncurry, which are evidenced is different reports published in the contemporaneous issues of the local newspaper of Cloncurry Chronicles. Like the other two examples discussed earlier, this structure this mosque is also a hybridized version of local ideas, technologies, and the image of the mosque they carried from the homeland.



Figure 7: 'Queenslander' or 'Wooden House' Windsor, Queensland, Australia Architect/Builder: Unknown Late 19th Century (Source: State Library of Queensland)

# 4.0 **DISCUSSION**

As architecture these mosques represent a particular time and material culture of a group of people. It reflects their value system, their social status, resilience, and assimilation and most importantly their imaginary parallel of a homely space in a foreign and apparently hostile land. Reading these architectures as text is necessary to reveal the complete narrative of the history of these building as well as of these people in an alienated land.

This discussion offers a critical interpretation of the more transient traces of early Muslim cameleers in Australia, and their representation in the equally scanty tangible evidence. From a particular point of view of Architectural history, it has attempted to discern the different historical layers that overlapped and infused together to shape the architecture of these mosques. However, from the perspective of settlement history this architectural evidence should be studied in such a way that it could reveal the culture of building adopted by these people; how did these early Muslim migrants and their spatial concepts had been realized in a non-Muslim and alienated environment? It needs to be recorded as part of the resilience and compromise of the process by which diverse peoples across the world integrate cultural-historical contexts, regional styles, functional needs, and environmental possibilities within that system (Rashid and Rahim 2011).

Certainly, the architecture of mosque has played an instrumental role in recording the facets of Muslim diaspora through time and space. The character of Islamic architecture in each place thus depends on the emergence of Islam in that place and its subsequent impact on the social, political and cultural life of local people (Rashid et al 2013). The case studies that are discussed earlier reveals that this process could be observed at two levels. At an explicit level, it involves the conscious attempt to create a particular place with a religious and symbolic meaning. But it also involves a vernacular mode of understanding centred on the

worldview of a particular culture, its values, and attitudes toward space. This mode of vernaculars sometimes works at the subconscious level while addressing the similar architectural problem in an apparently alien situation. Thus, while an overt, religious consciousness may shape the "visible" superstructure of the outback mosque, the underlying vernacular ideas define the "true" nature of the tectonics of the building and its being. This has led to the production of ranges of architecture that are diverse and enriched with different varieties of forms, articulations and morphologies.

From that perspective, the architectural and forms and shared narratives of these mosques are hybrid in nature (Moussavi 2008). Thus defines these mosques as a contested terrain, more than just a place for worship. Indeed, it was a socio-political "place." From the conception to their current position and architectural expression, these mosques are fundamentally a place of perpetual struggle by Muslims to assimilate into broader Australian society (Ganter 2008). Each of them might not be a distinguished piece of architecture in terms of its exterior appearance, but it is distinguished in the way it blends subtly with the antipodean locale. The buildings were mostly constructed using simple technology and materials common to its time and place. But its sequence of spaces responded to traditional notions familiar to early users from their experiences in their South Asian homelands. Rather than mimicking their own images of a mosque, mosque patrons relied on a locally available building materials and technology to interpret these qualities in the setting of colonial Australia. Unlike other contemporary urban mosques in Australia (for example, the Perth mosque or the Auburn mosque in Sydney) the images of homeland, the aspirations of the user, the fabric and the scale of the neighbourhood, and the available technology were hybridized here in these cases.

As part of the discourse on Islamic architecture, these mosques should be examined as a hybrid, rather than attempting to categorize it according to the elemental domain of forms and styles based on dynasty, local tradition, and building typology. These presuppositions about Islamic influence, artefacts and cultures are largely irrelevant in a situation where supposedly "Islamic" elements have no precedent. Hybridized forms and shared architectural narratives that arose during the Islamic period in a particular region and which are unique to the material culture of that place sometimes remain elusive due to the myopic but popular perspective that there are "correct" forms of "Islamic identity." Such stereotypical conceptions of Islamic architecture may obscure historical processes of hybridization and its diverse morphological outcomes and may diminish the value of buildings like these further. This necessitates a close observation of the process by which minority Muslim peoples across the world integrate and assimilate cultural- historical contexts, regional styles, functional needs, and environmental possibilities within that system.

Few studies focus on the architecture of Muslim communities in regions where Islam is not the predominant faith, especially in the southern hemisphere. The hybridized form of these outback mosques, which was recently measured and documented by the author and which examined in this paper, is an important counterpoint to historical confabulations which champion selective, supposedly authentic, largely Arab-centric—possibly mythologised—forms of 'Mosque' architecture or privilege the dynastic marvels of imperial patrons. This paper argues, then, that a new theoretical framework is required to interpret architectural hybrids like these that are, we argue, typical rather than exceptional, and no less important. This paper thus examines these mosques with emphasis on the innate quality of organizing space and forms and using them to connect the microcosm of architecture to the macrocosm of the world rather than focusing on elements, motifs or decorations that may or may not exemplify typical representations of supposedly 'Mosque' architecture. It focused on how religious beliefs, social and economic structures, political motives, and aesthetic sensibility were articulated in the architecture. The paper is not concerned with the beauty of these buildings, rather the focus was to discern the process through which this architecture was shaped and materialized.

## 5.0 CONCLUSION

Architecture is a novel and revealing frame of inquiry to gain insight into human values and belief systems, cultural diversity and difference in colonial, national and global contexts (Scriver and Prakash 2007). Beginning with the study of these smaller mosques around, which this nascent Afghan Muslim community in

Australia could meet, this paper offers a platform to delve deeper into the discourse on the culture of dwelling of the early Muslims in Australia by observing the later building of increasing permanence and substance, acts of building marked the periodic (seasonal) and eventually the permanent (post WWI) transition from the peripatetic lifestyle of the working Muslims to the more integrated, community-based lifestyles that these pioneering Muslim migrants adopted as they 'settled-in' to intimate and continue socio-economic relationships with other Australians.

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# IDENTIFYING LOCAL MORPHOLOGY BY COMPARING SPACE SYNTAX OF FOUR HERITAGE TOWNS IN UDUPI DISTRICT OF COASTAL KARNATAKA, INDIA.

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Abstract: The urbanization pattern in Karnataka shows rapid decline in number of small towns. There is a network of small towns which facilitate the whole region for socio-political, economic, religious infrastructure and identity. This study is to find a way to define the town in terms of social logic of space, to identify with respect to region and people. The study analyses the physical configuration of four towns, namely Barkur, Brahmavar, Udupi, Basrur. These towns belong to around 8th cent and have varied in hierarchy in time, yet they show a pattern of town structure which relates to the regional pattern.

Keywords: Heritage towns of Udupi, space syntax, morphology of small towns,

## **1.0 INTRODUCTION**

The urbanization pattern in Karnataka shows rapid decline in number of small towns which have been reduced to almost a dummy urban entity with inaction in their expected functions and services. However, in Udupi District there existed a model of small urban knots along with small towns. Along with infrastructure, character and heritage of a place also plays an important role to any development as many of these towns have their beginnings from 8th century A.D. This study is to find a way to define the town in terms of social logic of space, which in-turn may help identify key features of the town which gives its identity with respect to region and people. The study analyses the physical configuration of four towns, namely Barkur, Brahmavar, Udupi, Basrur, to determine the space syntax in six indexes with respect to connectivity of axial lines and convex spaces and depth index from the main transport node.



Figure 12: Map showing the location of Basrur, Barkur, Brahmavar and Udupi which lie along the longitude of 74<sup>0</sup>44" E, west coast of Karnataka in India. (Source is Google image as on 13<sup>th</sup> June 2011).

The findings of the map are then linked to feature of land-use with the temples and historic maps to support the behaviour of the form. These towns belong to around 8th century and have varied hierarchy in time, yet they show a pattern of town structure which relates to the regional pattern.

## 2.0 CONTEXT OF THE TOWNS

## 2.1 Physical Character of Udupi District

Udupi District has 98km of coastline along Arabian Sea in the west and western ghats in the eastern side which is has altitude of 980 to 1834m above MSL. The district is a narrow strip varying from 10km to 45km width and 100km length hence having a sloping terrain of 10% slope on an average. The climate is predominantly hot and humid with temperature varying from 38°C - 28°C in summer to 28°C -18°C in winter. The region receives around 4000mm of rainfall. This makes the flow of water and its tributaries an intricate pattern in the region. To retain the rainwater a complex system of man-made lakes and canals and tributaries are used for water supply for agriculture and horticulture. The wells are normally used for household purposes. This is one of the most sustainable forms of water resource management for the given terrain and climate. These towns form a network of urban knots providing the required social, administrative, economic, religious and cultural infrastructure for the settlements in the region. These towns have a core which have a temple and a processional path of ratha (a traditional cart as a vehicle of the God)



Figure 13: Conjectural map of town plan in 14-16<sup>th</sup> century of Udupi, Barkur, Brahmavar, and Basrur(Source Shetty, 2015, p. 61)

## 2.2 Historic context

The main centers of South Canara from 2<sup>nd</sup> cent to 7<sup>th</sup> century were Barakuru, Basarur, Haduvalli, Gerusoppe north of river Kalyani. In 7th and 8th century in Sanskrit work Prapan Chahridaya seven territories of the west coast are mentioned Kupaka, Kerela, Mushaka, Aluva, Pasu, Konkana and Parakonkana. This would mean that the Alupas held power for at least 12 centuries which is a record in the history of India. The place was called by several names in ancient times as Barakanur, Barahkanyapura and Barakuru. During 8-9<sup>th</sup> century Barkur was an established economic center of trade as port town, Udupi was pilgrim center with temple, Brahmavar was a commercial center with temple at its core and Basrur was a small port town. In 12<sup>th</sup> century Barkur became the capital, Udupi, Brahmavar and Basrur were small towns with commercial activities around the temple at its core. Barkur(Aluvakheda) later took the sovereignty of the Kadambas of Banavasi and total annexation of Vijaynagara Empire. During Vijaynagara rule from 1336 to 1600 AD it was the period of economic prosperity, social harmony, and political consolidation. It is during this time that the physical manifestation of these towns can be dated; however, the footprint could have been from the Alupa times. In later times, the city became the political headquarters of the Hoysalas and then the provincial capital of Vijaynagara Empire. Further, Barkur witnessed the rule of Keladi Nayaks, Haider and Tipu of Mysore and

the British. (B. V. Shetty) (Bhat) However, after the Tipu's invasion and during the British empire the status of Barkur and Basrur went downhill and today it is a small town belonging to three different panchayats. At present Basrur is struggling to maintain its identity as town, Barkur is a small town, Brahmavar has grown as a small municipal area and Udupi town has become the district headquarters.



Figure 14: Map as documented in 2008 of Udupi, Barkur, Brahmavar and Basrur (Source Shetty, 2015, p. 62)

# 3.0 SPACE SYNTAX ANALYSIS

Space syntax was introduced by Bill Hillier in the book' Social logic of Space', co-authored by Julian Hanson n 1984. Here the theory establishes a strong link of people's cognition was related to physical configuration of tow. The physical structure of town would reflect the social construct of that culture and the social economic infrastructure of the town. (Hillier Bill). This analyses the configuration of the town as per its connectivity, visual link, convex spaces. It is based on studies that proved that the distance matters less as compared to geometry, geometry makes less difference as compared to visual link and connectivity for the people's cognition of town structure. (Sadalla and Magel) (Bill Hillier). Hence to understand the town structure the public memory of town would most often rely on the configuration and connectivity of spaces. The axial link index and axial connectivity index map indicated higher index for higher capacity to hold activities. Finally, depth map showed higher index equals higher privacy. The indexes of axial lines and convex spaces of the three towns were super imposed to find the most important roads and spaces.



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MAP OF BASRUR TOWN



Figure 15: Combining axial connectivity, axial link and depth index to predict the popular routes or paths for Barkur, Basrur, Brahmavar, Udupi.

The cumulative map indicates that Barkur and Basrur have the central crossroads dominating as the most important and the hierarchy lowers around the periphery. The Pattern observed in Brahmavar is of loop and infill an in Udupi it is having the central crossroads, however it has expanded as a grid with infill. The temple and the processional path dominate as a focus in all four towns.





Figure 16: combining axial space, convex space adjacency and axial link index to predict the location of nodes and landmarks for Barkur, Basrur, Brahmavar, Udupi.

## 4.0 MORPHOLOGY OF THE TOWNS

The structure of town of Barkur starts with a dominant N-S, E-W crossroads with landmarks dotting each sector and giving identity to each. The natural boundary of river marks a strong edge along west and south end. The turning of road marks the end of town at the north and eastern end. The infill is like loop system and the third hierarchy of landmarks are not identified by indexes but rather from associations, however the first and second hierarchy landmarks coincide with the indexes. Basrur is similar to Barkur in terms of central cross roads however the extent is less elaborate and smaller in size. The northern boundary is marked by river edge, south and west is marked by road, however the eastern boundary is less clear marked by smaller roads. In case of Brahmavar and Udupi the town structure emerged after a gap of 10 centuries hence it differs. The town of Brahmavar has a dominant triangular area with temple and processional path at one end in the north east. The western and southern edge is a road, and the infill are smaller roads. The landmarks are concentrated at the junctions of the three dominant roads. In case of Udupi, we have the oldest cross roads in the eastern end with the temple and processional path in the mid-point of the eastern line. The roads are in N-S, E-W orientation. The town has developed along a grid pattern on the western side of the old road and temple square. The landmark is at the junction of the outermost grid of the four quadrants, the inner grids are disjointed and varying as per the infill development which gives them distinct identity and not repetitive.



Figure 17: Important landmarks and routes as per the indexes of Barkur, Basrur, Brahmavar and Udupi (Source author)



Figure 18: The ratha Beedi font view and typical cross section (source author)

#### 4.1 Ratha Beedi the central spine

In the four towns the ratha beedi is different. In Udupi it is in form of a loop around two temples and forms a square shape. It thrives with activities during festivals and also features strongly in social and cultural activities of the people. It can have up to one lakh people at a time. In case of Brahmavar it is less significant however it is still the religious centre of the town and has up to 50,000 people at a time during festivities. In Basrur it is hub of activities of the town and has up to 20-30 thousand people during festivals and social gatherings. In Barkur it is one of the four important landmark of the town and it hosts multiple religious' activities of the town. The other landmarks are also marked by temples and front yard of the temple. Hence Barkur has multiple spaces for activities of each quadrant however this temple is the oldest and most significant for the town.



Figure 19: The 'Ratha-beedi' in Udupi is square-form of road which loops around the two temples.



Figure 20: The 'Ratha-beedi' in Brahmavara is linear to the west of the temple



Figure 21: View of ratha-beedi in Basrur loops around the temple.



Figure 22: The map of 'ratha-beedi' in Barkur is in 'L' shaped form.

# 4.2 The built form typology

Along this core has building which have a continuous semipublic area in form of verandah. This is slowly disappearing when the new buildings are replacing the old. The transitional spaces along the edge of the road allowed the people to rest, gather, interact, and conduct their daily activities. This made the street more human and livelier.



## 4.3 Identification of the boundaries

The turns in the routes, river edge, tank define boundaries of sectors and zones of the town. The network of such features is demonstrated in Barkur in multiple modules for each sector. In other three towns only one such space exists. These give identities and define the markers of the boundary of town.



Figure 24 The main temple with tank and ratha beedi in Barkur





# 5.0 CONCLUSION

Key features that dominate the character of all four town cores are the processional path near the temple called ratha-beedi (cart-street). This is the oldest part of the town and the extensions are in line with it in terms of physical configuration. It keeps it as a central feature and the periphery reduces in hierarchy. Though the structure of Brahmavar and Udupi are not symmetric the old core still dominates as the key identity of the town. It still features as first hierarchy landmark in terms of physical configuration. The nature of the street and temple precinct is lively and marks the cultural hub of the four towns. This Ratha Beedi and the space in front of the temple becomes a reflection of various social, cultural festivities of the town. From this study it is clear that the historicity of the city and evolution should retain the hierarchy and importance of the key landmarks and features of the town. When new facilities develop, and the town grows it should be in tune with the language of the town and enhance the old as well create new destinations. One should be able appreciate the role of various features and locate in strategic positions as per the configuration of the town.

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# ECOLOGICAL SUCCESSION, PUBLIC INVOLVEMENT, AND IDYLLIC CULTURE IN CREATING SENSE OF RURAL LANDSCAPE NARRATIVES

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Abstract: In the design development of making sense of rural narratives, this article will focus on three aspects in terms of ecological succession, community engagement and villatic culture to recognize the locally distinctive rural landscape narratives and create a culturally and ecologically rural landscape. The research method is based on successful rural landscape design case studies to distil rural landscape narratives in ecological, social, and cultural manners to be appropriately applied to rural landscapes in China with the respect of their spirit of places.

Keywords: Ecological succession, public engagement, cultural landscape narratives

## 1.0 INTRODUCTION

Future rural areas will be thoroughly developed considering high density of urban development; therefore, the population movement will gradually expand to rural areas, thus requiring strong needs of both culturally and ecologically sustainable development in creating sense of rural landscape narratives. The creation of narratives in rural landscape is divided into three parts: a) Blending landscape into rural areas, which is based on the respect of natural process, in order to create narratives reflecting ecological succession in rural landscape. b) Encourage public interactions to experience the poetic and diverse rural landscape, reinforce sense of rural landscapes and build up strong narrative threads. c) Explore and understand idyllic culture in rural environment in order to capture the spirit of rural landscape. This article will explain how respect of ecological succession, encouragement of public interactions and exploration of hidden culture to delineate the rural landscape narratives, and the study of the method will be applied in Chinese rural landscape context.

## 2.0 ECOLGOCIAL SUCCSSION - THREAD

George, S. (1975) summarized the benefits of rural landscape bring to us three 'f 's including fuel, food and fibre, water, and mineral supplies, as well as active recreation, thus rural landscape is our major biological reservoir and social reservoir (p.14). Nature is a dynamic evolving process instead of a still object, like Chris, R. (2014) argued that change is formed into ecosystems, which are categorised partly unpredictable and dynamic, and ecosystems gradually succeed into climax states which remain permanently unless disturbed by an external force, thus ecosystems also depend on change to mature and rejuvenate (p.25). It is significant to respect rural landscape and rejuvenate its changing process in constructing rural landscape narratives.

## 2.1 Succession as an Essential Part of Creating Rural Landscape Narrative Thread

Rural landscape is damaged by both natural disturbances and human-generated disturbances, and human activities become the dominant disturbance in rural landscape, though rural planting community has its own rate and structure of succession after disturbance. In terms of concept of succession, Egler, F.E. (1954) proposed the importance of the propagule pool in controlling succession, which illustrates when plants are disturbed, the soil maintains a propagule pool in epitomising previous successional stages. Drury, W.H. and Nisbet, I.C.T. (1973) elaborated species replacement occur during succession as the outcome of competitions in a changing environment. Connell, J.H. and Slatyer, R.O. (1977) developed three models for succession including facilitation, tolerance, and inhibition. In terms of the importance of succession, Lawrence, R.W., Joe, W and Richard, J.H. (2007) explained that succession is an essential ecological process in underpinning ecological restoration (P.168).

Wulff, R. (1983) interpreted landscape design should be site and society responsive, encouraging designs to be reflected to 'respect the land' (P.02). As a landscape architect, we need to have rich knowledge of ecology, when we plan rural areas, we not only preserve landform characteristics and protect native habitats, but more importantly respect the natural processes and facilitate succession as an essential method to recover disturbed

rural landscape. Helprin suggested natural process and sequences are used to construct narratives and Gabor elaborated the sequences of nature could interpret the experiences. Therefore, respecting the natural process will be an essential part of constructing rural landscape narratives.

# 2.2 Rural Landscape Narrative Timeline from Covering, Exposing to Changing

In the earlier period, landscape design method regarding damaged landscape is to conceal all worse landscape conditions including waste, erosion, drainage patterns, geologic formation, in order to beautify the picturesque landscape. Then, landscape practices emphasis on the unmasking of natural process and man-made infrastructural systems, including the method of recycling waste, presentation process of erosion, drainage patterns. Nowadays, exposing landscape is not enough to enlighten and educate people, landscape architects are eager to bridge the relations between culture and nature. In summary, these three stages indicate how landscape architects creating a thread to reflect rural landscape narratives development. At first stage, existing rural landscape characteristics are removed, or some damaged lands are hidden. At second stage, landscape architects intend to expose the existing rural landscape conditions to interpret the hidden meanings and its historical development traces and revealing the problem may be the first step toward collectively solving it. At third stage, sustainable renovation practices will replace the simply transparent landscape conditions, because there is more to change than simply exposing the problems, it also emphasis on generating the sense of protecting rural landscape for local community.

## 3.0 ENCOURAGE PUBLIC INTERACTIONS - PLOT

It is important to identify the local characters of the rural landscape in order to encourage locally distinctive design, and local community will represent a strong voice in recognizing the visual quality of the rural landscape. Local commitment will lead to a high-quality design, enhance the local life quality, and build a thriving future for rural area. Local communities are designers who know what they mostly need, although human cannot manage the gradual changing ecosystems, we could manage ourselves and our activities, so all those information from local community will inspire landscape designers.

## 3.1 Integral Method in Identifying Rural Landscape Characters

A good example of applying integral method into rural landscape is English Heritage. Rachel, C. T (1999) analysed that English Heritage's approach to nature conservation is categorized into five parts: identification of significant characteristics, launching the wildlife importance of the Historic Properties portfolio, raising this interest within English Heritage, inclusion of habitat and species requirements into site management and development and incorporation of ecological information in interpretive material (p.152). In addition, the objective of Village Design Statements in England is to pursue the distinctive character of the village and the surroundings, and it is identified in three levels including the landscape setting, the shape of the settlement and the nature of the architecture, in addition, to work with the local planning authority and influence future policies (p.6).

The configurations of landscapes reflect the interconnection of natural and cultural processes. An integral method for rural landscape needs to consider a few aspects:

- Rural landscape features, setting, forms and patterns, its geographical and historic background
- Overall patterns of the rural landscape including functional zones (open spaces, agricultural zones) and layouts (rural landmarks, hedges, walls, fences, facilities, etc.)
- The traffic routes (roads, streets, footpaths, cycle lanes, parking) within the rural landscape
- The visual character of the rural landscape setting, and the relationship with surrounding areas
- The visual character of the buildings, building design styles, sizes, materials, densities, openness and histories
- The relationships between buildings and landscapes
- The community, economics, and future development

# 3.2 Public Memories in Collecting Rural Landscape Narrative Stories

Narrative could be regarded as a thread to integrate events together to interpret both of experience and rural landscape spirit. There are many ways to make sense of experience and rural landscape spirit. Firstly, the patterns of rural landscape indicate the interconnection of natural and cultural procedures. In addition, memory is critical to collect pieces of fragmentary events in rural areas, which will evoke sensational emotions in many ways. The memory is a medium to collect or gather experiences in rural areas among friends, family, neighbourhoods, and strangers. Therefore, we need to design rural landscape patterns closely bridging nature and culture and design an experience with time and historical trace.

# 3.3 Public Independence in Creating Rural Landscape Narrative Sequence

Rural environment functions as chronotopes or a time machine, it imprints varied events with memorable sensations in a narrative plot. There is an interesting concept how Matthew, P. defined story time and narration time, which are independent variables related to narrative orders. Narration time refers to the time it takes to travel through or to practise a succession or revolution. Story time means the imagined time period of the story (P.115). In a more explicit way, when designing a memorable rural landscape route, the participants walk through the site at their chosen speed and ways when participate in various events, and the rural landscape itself is also gradually changing due to human engagement and natural succession, which means participant will experience different scenarios during different time for the same site. Moreover, subtle or obvious change within the same site evokes sense of nothing is eternal, leaving various memories and experiences. However, some sequences of narratives could be pre-structured in the sequence of flashback or chronology to convey a distinct way of understanding and epitomising history or events of the past, current and future. Like Tuchman once delineating synaesthetic experience where "*we will be able to feel, touch, hear and smell, and in other ways, connect with a time that once was*".

Tim, A. (1999) expressed pride and community involvement in the local environment act as a force for regeneration (P.114). Encourage local communities to explore and care for the local features including both physical heritage and 'soft' heritage adapting to the change. One of the successful example is Countryside Commission's Village Deign and Countryside Design Work, in the case of Village Design, the Countryside Commission has developed a method which encourages local communities to identify the particular character of their villages and local environment, then those advices will be documented in planning guidance for Local Planning Authority.

When planning rural areas, landscape architects call for considering stories dwelling in and developing with personal or social experiences attached to a place. Understanding the site and the stories behind it and connection to other stories will help to construct narratives. People play an optimistic role in understanding, directing and intervening in the development of natural process. People engage with events which happen around them, in return, their daily routines and actions will form the threads of narrative and patterns of rural landscape design. Therefore, hearing communities' oral stories, listening to personal sensations, expectations will sparkle the design, and better meet communities' needs. The less control of the design, the more active of public engagement, when communities increase admission to characterise their landscapes, they also advance understanding of local area and power of decision-making. Although encouraging the expression of differences does risk the potential for dangerous conflicts, that can be disguised by harmony and unity.

# 4.0 EXPLORE HIDDEN CULTURE - THEME

Gathering is a significant means of making narratives and landscapes. Monitoring what gets masked and what gets unmasked is not only based on landscape architects' subjective consciousness, but hidden spirits to be revealed by viewers. The design of rural landscape should capture the spirit of its unique characters and idyllic culture, construct local communities' pride of the place and motivate themselves to conserve and care for their local environment.

4.1 Exploring Cohesive Theme of Rural Landscape Narrative

The sense of the place is outlined by the particular characters that define the features of a specific area. Tim, A. (1999) interpreted the definition of a locality is to emphasize on the need of belonging as well as a certain individuality (P.163). Alexander pope articulated the idea that the picturesque genius loci indicating that a landscape owns hidden spirits or qualities waiting to be revealed. Like Potteiger, M. (1998) suggested the initiation of memories and remembering the activities of life are generated by connection with the spirit of a place including its rhythms, seasons, light and sound, if the landscape character is detached, the mutual memories that progressed with the landscape may be disregarded, as well as the spirit of a place is departed.

# 4.2 Leaving Space for Ongoing Rural Landscape Narrative

Robert, H. believes leaving unprogrammed spaces for communities, more motivating activities will occur as leaving silence greets the voices and actions of others (P.212). It gives more freedom to anticipants, and this is the core of friendly design of rural environment.

'For landscape architects, they believe that there is more to understanding a site than recording grades, viewsheds, drainage, and functional use. For them, each place has a residing invisible spirit and an underlying natural order that must be revealed, searched for, listened to, felt, or understood by careful observation' (p.143).

# 5.0 SUCCESSFUL RURAL LANDSCAPE DESIGN CASE STUDY

The successful case study in Kingsland Overlook in rural areas of America reflects how ecological succession, community engagement, and historical restoration culture build a cohesive and diverse restored wasteland. The Kingsland Overlook was successfully directed and re-sequenced in five typical communities: two early succession meadows, a late woody field, a young woodland, and a mature forest. The goal of master plan is to limit the fragmentation of habitats and reconnecting ecological areas in order to create a cohesive system. In the design process, designers argue for acknowledging and telling the whole tragic story of wasteland sites instead of covering them under a layer of green, in this way to raise community awareness and explain the hidden narratives behind the wasteland. Recycling landfill which contains methane transforms green energy for many communities. The successful restoration of Kingsland, rather than re-creating nature, incorporates ongoing human activities and narratives, as well as integrating nature and culture, past and future, in restorative narratives.

# 6.0 IMPROVEMENT IN CHINESE RURAL BEAUTIFICATION DEVELOPMENT

Rural landscape is gradually utilized for urban development or industrial purpose in China. Chinese rural landscape experienced from agricultural culture in feudal dynasties to rural beautification since 2005, although these changes indicate sustainable rural development models, it still needs to be further exploded in showing the respect and connection to nature, restoration of rural landscape and retelling the history of rural landscape. For example, those young people who live in rural areas like Yun Nan, have lost connections with vernacular rural landscapes (agricultural patches), thus raising awareness of rural landscape would be a way to restore the connections and broaden the spiritual experience that local communities can find in agricultural patches. In natural areas like Yun Nan Province and cultural areas like Beijing, it is important to reinforce rural landscape agricultural character, wildlife habitats, historical and cultural features, in order to respect and enhance the distinctive characters of the land and built environment for the future land use and management.

The importance of integrated approach applied in Chinese rural landscape could incorporate understanding of ecological succession and identification of ecological features, consideration of wildlife significance to the rural landscape management, community involvement in the planning decision and conservation of cultural heritage. In addition, a structure plan of future rural landscape development needs to be constructed in national, provincial, regional, municipal, country aspects, with much more detailed and specific land use planning, and more attention to conserve and improve landscape quality.

# 7.0 CONCLUSION

This article interprets three methods to capture the spirit of rural landscape in order to create rural landscape narratives: respect of ecological succession, encouragement of public interactions and understanding of idyllic culture and histories in rural environment. Ecological succession becomes an essential part of constructing rural landscape narrative thread. The active public engagement advances the understanding of the site and the stories behind it and connections to other stories, which will help to construct the main plot of rural landscape narratives. The spirit of unique characters and idyllic culture form the cohesive theme of rural landscape narratives. Finally, landscape architects are encouraged to design rural landscapes that reveal both social and ecological needs in a low maintenance and low-cost construction manner.

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# INTRODUCING INTEGRAL SUSTAINABLE DESIGN AS A METHOD FOR EVALUATION OF COMMUNITY CO-DESIGN PROJECT

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**Abstract:** Integral Sustainable Design (ISD) is a framework developed to offer a more holistic way to design and assess sustainability of new and proposed buildings, including qualitative and quantitative aspects. This paper introduces this framework as a method for analysis of community co-designed projects in a non-western culture using designs created during the Intercultural Dialogue through Design (iDiDe) student studio workshops for Anganwadi buildings in Karnataka, India as a case study. Analysis methods appropriate for each quadrant are adapted from previously published ISD analyses of finished buildings. Results support the argument that community participation in design leads to better outcomes.

Keywords: sustainability assessment, Integral Sustainable Design, analysis, co-design, architectural design.

## 1.0 INTRODUCTION

Community participation in design is central to the Intercultural Dialogue through Design, international design program (Ang, 2017) and is asserted to lead to better design outcomes from the process. This paper introduces Integral Sustainable Design (ISD) as a holistic approach to assess sustainability and analyse the outcomes of the process, which include personal, cultural, and social sustainability of projects in addition to environmental and economic factors (Sandman, Levanen & Savela 2018).

## 1.1 Community Participation in Design

A number of arguments are used to support the advocacy for co-creation, co-design and community participation for developing new facilities or services for economically or socially disadvantaged people in developing countries (Hussain, Sanders & Steinert 2012) (Sharma et al. 2008). When beneficiaries have an active voice in the design processes, their needs become better understood and the resulting services or facilities are a better match for their needs (Brandsen, Verschuere & Steen 2018, p. 231). Participatory design acknowledges that the designer is accountable to the people whose lives will be affected (Norman 2002). Research findings support this by suggesting that the incorporation of users' tacit knowledge by the co-design process leads to better outcomes (Spinuzzi 2005). More recently, a phenomenon labelled as 'collective intelligence' (Fischer et al. 2005) was described as 'a shared insight that comes about through the process of group interaction, particularly where the outcome is more insightful and powerful than the sum of individual perspectives.' (Sanoff 2007). Better alignment of facilities and services with needs also leads to greater user satisfaction and the process of exercising voice, influence and some level of control generates a sense of empowerment among participants (Brandsen, Verschuere & Steen 2018, p. 231) (Zimmerman 2000). Evidence of empowerment includes improved perceptions regarding the responsiveness of public agencies, procedural fairness, greater tolerance for diverse opinions, and stronger social connectedness and engagement of disadvantaged communities (Brandsen, Verschuere & Steen 2018, pp. 235-6). Participatory design acknowledges the democratic right of those affected by decisions to be involved in them (Ravina, Shih & Medvegy 2018; Sanoff 2007). Being involved in decision-making encourages users to contribute skills, labour and resources to the project (Ravina, Shih & Medvegy 2018). This can make a project in a disadvantaged community more economically feasible (Johar 2017). It is also observed that community participation in projects in developing countries results in capacity building among the community and therefore the effects of the project will have a longer life after the external intervention agency has left (Lima Constantino et al. 2012) (Hussain, Sanders & Steinert 2012) (Eftekhari et al. 2013) (Drain, Shekar & Grigg 2018) (Kang 2016).

# 1.2 Evaluation of Participatory Design Projects

In the literature there have been a number of reports of participatory design building projects in developing countries, for example, design of primary schools in Rajasthan, India (Singh & Prakash 2013), design of an eco-hostel in a Mayan community in Mexico (Garduño García 2015), affordable housing projects in Tanzania, Namibia and Chile (Sandman, Levänen & Savela 2018), community housing in the Philippines (Ravina, Shih & Medvegy 2018), and an urban space regeneration project in a favela in Rio di Janeiro (Gaudio, Franzato & De Oliveira 2017). Notably, scant critical evaluations have been performed and none have accounted for experiential and cultural aspects in the assessment reporting.

## 1.3 Integral Sustainable Design as a Framework for Analysis

The ISD framework for designing and analysing building projects (DeKay & Bennett 2011) is based upon Integral Theory proposed by Ken Wilber. It suggests that knowledge and experience can be placed in a 4quadrant matrix with axes of interior-exterior and individual-collective (Wilber 2001). ISD aims to improve assessment by encompassing qualitative and experiential aspects which were previously neglected by concentration on solely quantitative performance-based approaches. Refer Figure 1 below.

	Subjective	Objective
Individual	Experiences self and consciousness • profound aesthetic experiences • human psychological connections to place	Behaviours science, mechanics and performance high performance buildings local renewable resources safe, healthy places long term value
Collective	Cultures meaning, worldviews and symbolism • cultural communication using symbolic language • manifest how culture is inter- connected with Nature	Systems social and natural ecologies and contexts • systems use ecology as the model • solutions to fit particular places - social and ecological

# Figure 1: Graphical representation of Integral Sustainable Design quadrants including brief descriptions of design aims for each quadrant adapted from DeKay (DeKay 2011).

ISD does not consider any quadrant more important than the others, rather they are different lenses through which a design may be conceived and evaluated.

The ISD framework has recently been used as a tool to analyse buildings in Western cultures (Roetzel et al. 2015). That study showed that ISD could be a useful framework to evaluate a building's sustainability in a more holistic way than current building rating schemes. A building that performs well on objective measures of sustainability without satisfying qualitative measures such as providing a poor personal experience or failing to satisfy cultural requirements will be an incomplete attempt at sustainability. That study did not consider the applicability of analyses developed for non-Western cultures and included only limited analysis of the lower left (cultures) quadrant.

There is a potential non-alignment as the theory was produced with a Western worldview. Measures of effectiveness for each quadrant must be selected and in future may need to be revised or adapted for the cultural environment.

# 2.0 BACKGROUND

## 2.1 iDiDe Intercultural Dialogue through Design

Intercultural Dialogue through Design (iDiDe pronounced i-dee-dee) was been developed around participatory design of facilities for under-privileged communities in developing countries championing a social architecture agenda. Undertaken in partnership with universities and with an identified client community, the philosophy was founded by Susan Ang of Deakin University in conjunction with foundation partners International Islamic University Malaysia and University Teknologi MARA, Malaysia in 2010 and subsequently expanded to Thailand, Malaysia, Borneo, Indonesia, Sri Lanka and India (Ang 2017). The program includes cultural immersion activities and a participatory process that is adapted to the local context. iDiDe has shown benefits for increasing dialogue and awareness of cultures and design practices (Ang 2017). It has influenced empowerment of communities in effecting improved well-being and livelihood. (Palliyaguru, Karunasena & Ang 2018) (Ang, Karunasena & Palliyaguru 2018).

A current research project is in progress related to the 2018 and 2019 iDiDe studios including 3 reflective group workshops with program participants to obtain their feedback on the design process and their opinions of the resulting designs. This paper includes some very preliminary analysis from transcripts related to this project entitled: Engaging with rural communities using Integral Design Framework (IDF) to sustain the culture of building: the case of Anganwadi Ajjarkad in Udupi, India. This work was funded by Deakin University and received Deakin University ethics approval (reference number: 2018-324

# 2.2 Anganwadi project in Ajjarkad, Karnataka, India

India's Integrated Child Development Service (ICDS) introduced Anganwadi as a national initiative to improve the health and education of rural mothers and children in 1975 (Integrated Child Development Services 2009). 'Anganwadi' or courtyard shelter provides a pre-school and child and maternal health centre and is vital to rural community development in India. Often Anganwadi designs are imposed on a community by governments with little consideration for local needs or sustainability considerations (Bhawn 2011) (Ministry of Rural Development 2016) (Sahoo et al. 2016). Anecdotal evidence from Indian architectural faculty members reveals, there is often a disconnect between the building design when compared to the cultural and social needs of the Anganwadi stakeholders.

Under the ICDS scheme, an Anganwadi is required to have:

- a separate sitting room for women and children,
- a separate kitchen
- a store for storing food items
- child friendly toilets
- space for playing and
- safe drinking water. (Bhawn 2011)

in order to be able to provide the programs that ICDS funds.

Literature and web searching utilising EBSCOHost databases, Google Scholar and Google internet searching, using keywords such as anganwadi, India, community engagement, participatory design, co-design, architecture, studio, building, construction, has identified many different approaches to anganwadi design.

These approaches have been examined and categorised into four main groups:

- 1. Government guidelines or norms with prescribed designs (Ministry of Rural Development 2015) (Bhawn 2011) (Ministry of Rural Development 2016)
- 2. Architects Without Frontiers AWF The Anganwadi Project pro-bono practising architect designs for urban Anganwadis (The Anganwadi Project 2013) (The Anganwadi Project 2016)
- 3. Boutique one-off architect designs (Pinge 2016) (Bhatia & Baker 1991)
- iDiDe architecture student studio with participatory process (Ang, Karunasena & Palliyaguru 2018) (Ang, Devi & Karunasena 2019)

## 3.0 RESEARCH METHODS

The scope of this research is limited to applying the ISD framework to evaluation of two designs produced during the iDiDe studio conducted in 2017-2018 for an Anganwadi at Ajjarkad, in Udupi City, Udupi District, Karnataka State, India and comparison with one Indian government promulgated design (Ministry of Rural Development 2016). The location is shown in Figure 2.



Figure 2: Location of Udupi District, Karnataka State, India (Sabeena et al. 2016)

The three compared designs were modelled using Revit 3D design software, in order to perform analyses. Table 1 shows plans and images of 3D models of the three designs:



Table 1: Plans and images of 3D models for each design examined.


# 3.1 Quadrant UL – Experiences

Ideally, data on the personal response to a building would be collected by investigating impressions of participants who had experienced the building. As this is not possible for an uncompleted project, we have used the transcripts of feedback from the research workshops described above and the design workshops to obtain personal responses of users on the designs.

# 3.2 Quadrant LL – Cultures

In order to examine the cultures quadrant, we have utilised the reflective research workshop transcripts and information noted during the design workshops. Using the work of Sandman et al (Sandman, Levanen & Savela 2018) as a guide, the two designs were assessed on the following cultural factors:

- Safety
- Accessibility
- Cultural heritage i.e., match to vernacular building tradition
- Arrangement of spaces
- Availability of spaces to suit needed cultural purposes including rituals
- Use of adjacent spaces
- Colours or decoration

# 3.3 Quadrant UR – Behaviours

As the buildings are currently unbuilt, it was determined to use computer modelling software to analyse:

- thermal comfort and
- daylighting

Due to the designs' reliance on natural ventilation, it would be appropriate to use virtual wind tunnel software to analyse the performance of the designs, however, this is beyond the scope of this paper. Calculation of embodied energy is also planned for future research.

As the buildings are not heated nor cooled, an analysis of cooling or heating efficiency is not applicable. Other measures, including durability, use of re-cycled or re-usable materials, and resilience to floods are discussed.

Although water usage efficiency, harvesting and re-cycling would be an upper right quadrant consideration in a western context, in this project data have not been collected regarding water usage, appliances, mains pressure, etc. Nor was the design project in sufficient depth to require plumbing fitting specification.

# 3.4 Quadrant LR – Systems

Under the systems quadrant, the designs must be assessed upon how they fit into larger systems. For the purposes of this paper, we will examine the fit to:

- ICDS scheme
- Surrounding built form
- Local building typologies
- Local utility systems stormwater, water supply, electricity

For a complete analysis, it would be useful to examine how the building impacts user population interactions with other members of the local community in nearby buildings such as: primary school, high school, gram panchayat (local government) and any nearby health facilities. No questions regarding this aspect were included in the Ajjarkad Anganwadi workshops.

# 4.0 **RESULTS**

# 4.1 Quadrant UL – Experiences

Personal responses of workshop participants were split regarding the look and feel of the iDiDe designs. Approximately half of the participants wanted something exciting and different to engage the children. The conservative voices, most of whom were men and officials, wanted something pragmatic that conformed with local norms. One reason that was offered is that designs that are different to the norm cost extra to build. Design A - 5 Dots is more colourful than Design B - Sahasa. Both designs include a red oxide floor. Design A includes more areas of colour on the exterior, but Design B envisages a mural on the east wall. No government designs were presented to workshop participants. What is considered beautiful or timeless was not discussed. This will be an area that will require research into user experiential responses after one or some of the chosen designs are built.

# 4.2 Quadrant LL – Cultures

The two iDiDe designs performed better than the government example design on these measures. Items that were not discussed in the workshops include: a) any particular symbolism of colours and decoration related to the local culture and b) symbolism of form. Table 4 shows an assessment of each design against the requirements based upon user's cultural needs as per the design workshops and reflective workshops:

Requirement	Government Design	Design A – 5 Dots	Design B - Sahasa
Safety – some fencing or walling of the	Not included	No – apart from existing	No – apart from existing
grounds for outside play		wall to road	wall to road
Accessibility	Ramp access to main	Ramp access to main	Ramp access to main
	entrance,	entrance,	entrance,
	Short distance to road	Short distance to road	Short distance to road
Bright colours for children	No	yes	yes
Private area for pre- and post-natal health	yes	No	No
examinations			
Toilets separated from kitchen	No	yes	yes
Toilet on downwind side	Depends on siting	yes	yes
Space suitable for prayers	yes	yes	yes
Large kitchen (relative to existing	yes	yes	yes
Anganwadi)			
Plenty of secure food storage	yes	yes	yes
Small vegetable garden	Not included	no	yes

<b>Table 4: Preliminary</b>	Assessment of design	satisfaction of user	cultural and o	ther requirements
				1

# 4.3 Quadrant UR – Behaviours

# Climatic context in Udupi

The climate in Udupi is a tropical monsoon climate (Köppen classification Am). The district is located on the coastal strip with the Western Ghats mountain range providing the eastern boundary.

Udupi District has an average annual rainfall of 4360mm of which 4239mm falls between May and October with a consistent rainfall averaging 30-50mm steady and continuous every day. There is very little rainfall during December through March. Temperature is consistently warm, with daily average temperatures ranging from 26.0 to 29.4oC. (Climate-Data.org 2019). Average wind velocity for this area ranges from 2.1 m/s to 3.5m/s (from Mangalore data (WindFinder.com GmbH & Co. KG 2019)).

# **Thermal Comfort**

The two iDiDe designs selected for comparison are open to the outside air and do not have any glazing. The students were advised not to use glazing as it would be vulnerable to vandalism from both humans and monkeys, leading to safety issues for the children with broken glass. There is no artificial cooling or heating envisaged in the designs. Therefore, the adaptive model of comfort is applicable (De Dear & Brager 2001) (Luther & de Dear 2003). The CBE Thermal Comfort Tool (Hoyt Tyler 2017) was used to assess the Udupi climate for comfort. Figure X and Y show the analysis of the maximum and minimum temperatures for the year located on the Adaptive Chart. Note airspeed is set to the minimum for the Tool.



#### Figure 1 Udupi Maximum Temperature

#### Figure 2 Udupi Minimum temperature

As reported Udupi temperatures range from 20.9oC and 33.4oC, there are only some days in summer where the temperature in an open building will fall outside the comfort zone. However, these calculations ignore the effect of humidity. Table 2 shows the calculated maximum and minimum Apparent Temperature (in the shade) by month during the hours of 9am - 5pm which includes the effect of humidity and wind.

# Table 2: calculation of minimum and maximum apparent temperature for Udupi during hours of 9am-5pm. (Climate Consultant 6.0 software (Liggett & Milne 2008) with data sourced through https://energyplus.net/weather US Department of Energy).

Udupi									
Calculatio	on of Appa	rent Ten	nperature	during ho	urs of 9am	5pm			
Month	Ten	np	Relative	lumidity	Vapour	pressure	Windspe	Apparent T	emperature
	Max	Min	Max	Min	Max	Min	Avg	Max	Min
	°C	°C	%	%	hPa (calc)	hPa (calc)	m/s	oC (calc)	oC (calc)
Jan	31.9	25	61	38	28.74	12.00	2.70	35.5	23.1
Feb	31.7	27	61	41	28.42	14.57	2.50	35.3	26.1
Mar	32.5	28	65	48	31.68	18.09	2.50	37.2	28.2
Apr	33.1	30	68	55	34.27	23.26	2.70	38.5	31.8
May	32.7	30	62	50	30.56	21.14	3.40	36.4	30.6
Jun	29.7	25	88	78	36.58	24.63	3.20	35.5	26.9
Jul	28.5	23	92	84	35.68	23.53	3.20	34.0	24.5
Aug	28.5	23	93	83	36.07	23.25	2.50	34.7	24.9
Sep	29.1	24	88	75	35.34	22.31	2.80	34.8	25.4
Oct	30.4	26	79	64	34.18	21.45	2.20	36.1	27.5
Nov	31.6	29	71	55	32.89	21.96	2.10	37.0	30.8
Dec	32.1	28	57	38	27.16	14.32	2.90	35.0	26.7

This shows that in the hottest part of the day the Apparent Temperature will be uncomfortably hot.

Given that the designs do not have access to electricity, nor budgets for HVAC equipment, passive design features must be used to reduce thermal discomfort. Shading of building openings and maximising ventilation are two important passive design strategies. Prevailing wind directions for this location are North to North-West as represented by the following wind rose:





The two iDiDe student designs present better opportunity for cross-ventilation because they have much larger openings on the west and north-west sides. The government plan has glazed windows which at most would be 50% opening.

#### Daylighting

As electricity supply was not available, daylight penetration was essential in the design. Daylighting analyses have been completed using Velux Daylight Visualiser software (Velux Group 2016). Table 2 shows the results of the lighting analyses with lux contours marked. Two times were selected for analysis in order to show lighting on estimated best and worst days: March 21 – dry season with fewest clouds, and July 21 – monsoon with complete overcast. Table 2 shows the results of the Illumination simulation.

These images show that Group B: Sahasa's design has better daylight penetration than the other designs. In order to reach the Indian Government lighting standard for schools of 300 lux (Indian Standards Institution 2008), both the government design and the Group A: 5 Dots design would require electrical lighting. However, we believe the analysis for the 5 Dots design is incorrect, because the Velux software appears to be ignoring the oculus in the roof and the jali (lattice) brick wall. Future research will examine this issue in greater depth.



Table 2: Daylighting in the afternoon on best and worst days.

# Durability, Resilience and Recycled Materials

All designs have similar durability, however, the filler slab concrete roof on the government design is not as easily repaired or maintained as the Mangalore tiles. Outdoor wood verandas on the two student designs would not be as durable as concrete and require more maintenance. None of the designs specify use of re-cycled or re-usable materials, such as Mangalore tiles, laterite blocks or recycled concrete aggregates, although there was opportunity for their use in India because there are significant savings to be obtained.

Resilience to natural disasters has not been assessed except for flooding. The site is not located near a water course, and the local building regulations specify the raised ground floor, which prevents flooding during the monsoon season from standing water that can take some time to drain away (Devi 2019). All designs satisfy this criterion.

# Safety

Aspects of safety related to building behaviours, as opposed to user's perceptions, including some raised by Sandman et al (Sandman, Levanen & Savela 2018), include

- Structural safety of the building/construction methods
- Safety of the design (stair railings, balconies, slippery floors, etc.)
- Fire safety of the design
- Use of healthy materials.
- Accessibility for fire engines and ambulances

Each of the designs use structural systems and construction materials that are traditional or well known locally and therefore able to be safely constructed and produce safe buildings. Materials selected are generally healthy with no outgassing of volatile organic compounds. The raising of the building floor under local building regulations should prevent any flooding from monsoonal rain. In a monsoonal tropical climate mould can be a health risk. Ventilation is also important for mould prevention. The two student designs, as discussed in 4.1.1 show better cross-ventilation for the prevailing breezes. Each of the buildings is within 15 metres of the main paved road, so all are easy to access for emergency vehicles.

#### 4.4 Quadrant LR – Systems

**ICDS Scheme** 

Assessment of design conformance to ICDS requirements is shown in Table 3:

ICDS Requirement	Government Design	Design A – 5 Dots	Design B - Sahasa
a separate sitting room for	No	no	yes
women and children,			
a separate kitchen	yes	yes	yes
a store for storing food items	yes	yes	yes
child friendly toilets	yes	yes	yes
space for playing	Not in plan	yes	yes
safe drinking water	Not stated	City water – see 4.6 below	City water – see 4.6 below

#### Table 3: Assessment of anganwadi designs against ICDS requirements.

From Table 3 it can be seen that the two iDiDe designs satisfy more of the ICDS requirements than the government example and Design B- Sahasa satisfies all the requirements.

#### Surrounding built form and Local building typologies

From examination of Google Street view, aerial photographs of the nearby Mahatma Gandhi Stadium, and photographs of the site taken by students and staff, the majority of nearby buildings appear to be single story with gable or flat roofs, and materials are commonly rendered and painted walls with Mangalore tile roofs.

Bright colours are often used. The adjacent school has a concrete slab roof. Thus, all three designs will blend into the local built form and building typologies, with the possible exception of the bare CSEB or laterite stone walls. Decorative embellishment such as the decorative jali parapet walls on the government anganwadi design are not typically seen on local school buildings.

#### Local utility systems - water supply, stormwater, electricity

Water supply in Ajjarkad ward of Udupi township is town water (Prabhu 2016) (Naina 2019). This is mostly supplied by two dams and some municipal wells (Bhat 2019). However, there are severe water shortages occurring each year leading to water supply on alternate days (Bhat 2019) and many people drill independent wells (Shenoy, Inchara & Ananya 2017). Given that during the monsoon months there is a large amount of rain, and the ICDS requirement for clean water, it would be appropriate to provide rainwater harvesting or a bore well facility. The government case study does not show any indication of source of water supply. Design A- 5 Dots shows a water tank. The capacity is not specified, and it appears to be too small to hold sufficient rainwater to last for the dry season. It would, however, probably hold sufficient well water to cover up to two days' supply to provide clean water during municipal water rationing. Design B – Sahasa does not show any indication of rainwater harvesting nor a bore or well. Thus, Design A performs better on this criterion. Karnataka state has had a rainwater harvesting project implemented for schools since 2006 (Shivakumar 2007). The designs appear to have mostly missed this opportunity.

Central Udupi township has a stormwater drainage system. We were unable to locate information of the extent of this system. Observation of buildings adjacent to the site show a lack of gutters and downpipes. Local advice is that water generally runs off slowly due to the low slope of the landforms and percolates into the ground to replenish the water table. On occasions there may be standing water in places up to knee level (Devi 2019). Electrical lighting was not envisaged in the designs, as all Anganwadis operate only during daylight hours. Cooking is primarily done using bottled liquid petroleum gas, so electricity connection was not envisaged for this Anganwadi.

# 5.0 DISCUSSION

While this analysis has attempted to be comprehensive, within each quadrant more in depth research is needed to fully assess designs. For example, it is clear that wind ventilation effects need to be examined to determine their actual effect on comfort by sourcing appropriate software and/or performing studies to acquire data. While there has been a significant body of research on indoor thermal comfort in some tropical climates, an equivalent to the ASHRAE 55 Adaptive Comfort standard has not been issued (Rodriguez & D'Alessandro 2019). An adaptive comfort model has been proposed for India (Manu et al. 2016), and in the future, results of modelling of indoor comfort using more sophisticated environmental analysis software, such as Energy Plus simulation software, could be compared to the IMAC (India Model for Adaptive Comfort) standard.

The results have highlighted areas where more research regarding building users subjective experience is needed, so that some range of responses can be predicted during the design stage. In the cultural quadrant, future research must employ more specific questions that examine design fit to cultural norms, such as questions regarding culturally significant colours used. Although this is a preliminary example, the iDiDe process showed how the ISD analysis framework can provide more holistic evaluations of built and unbuilt projects. This research did not explore the effectiveness of analysis tools for each quadrant from a Western or Asian perspective. The framework further identified areas where analysis could be broadened, and others where analysis methods or data collection strategies need to be reviewed. Analysis methods in every quadrant will need to be examined from a culturally indigenous ethnographic viewpoint to highlight omitted or inappropriate methods.

# 6.0 CONCLUSIONS AND RECOMMENDATIONS

This research introduced and explored how the ISD framework was used to assess the design outcomes of unbuilt projects in a non-Western cultural setting. The evaluation performed across all four quadrants of the

ISD framework sought to discover whether the assessment method used on this case study would support arguments that participatory design improves built environment outcomes in a developing world context.

To summarise the findings by ISD quadrant, in the upper left subjective experiences quadrant there is insufficient information to draw a conclusion, due to the projects being unbuilt. In the lower left subjective culture quadrant, the two iDiDe designs satisfied more of the users cultural and other needs. In the upper right objective behaviours quadrant, the iDiDe designs performed better on comfort analysis and daylighting analysis, and similarly on durability, resilience, and safety. In the lower right objective systems quadrant, the iDiDe designs satisfied more of the lower right objective systems quadrant, the iDiDe designs satisfied more of the lower right objective systems quadrant, the iDiDe designs performed stightly better on the analysis of utilities.

In conclusion, based upon this analysis, the two iDiDe designs performed better than the government example design on the aggregate of measures in each of the three quadrants examined. The findings of this research support the assertion that community participation in design leads to better outcomes. Further research involving analysis of more cases of unbuilt projects and across a range of both non-Western and Western cultural settings will enable a wider perspective on the value of the ISD framework in effecting better alignment between design intentions and community expectations.

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# A TYPOLOGICAL ANALYSIS OF RURAL REJUVENATION DESIGN PRACTICE BASED ON TRADITIONAL REGIONAL CULTURAL LANDSCAPE IN CHINA SINCE 2013

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Abstract: Under the development of village beautification movement led by the Chinese government since 2013, a large number of rural rejuvenation design practice projects emerged in the recent years. This paper presents a preliminary typological analysis or classification of five design practice approaches based on five major aspects of regional culture in rural China through desk research and case study: Design as picturesque, Build on the ground, Traditional technology renaissance, Agricultural diversity and Storytelling landscape. By classifying and analysing the genre, designers might focus on the core value of regional culture and find out the basic starting point

Key Words: Typological analysis; traditional rural regional cultural landscape; Landscape design Approaches; the Beautiful village construction

# **1.0 INTRODUCTION**

All imagination about heaven of human religion like paradise, the Garden of Eden, Nirvana and Acadia etc came from countryside which has always been important to human's survival and development space since human settlement. The need of production and human life in rural areas had gradually transformed the natural rural landscape characteristic to an agricultural civilization pastoral scenery. Instead of religion believes, Chinese people selected the combination of Ru, Dao and Buddhism to save themselves and regard Peach-Blossom Place, a typical scene of rural life with male ploughing and female weaving described by poet Tao Yuan Ming, as their Utopia. As an over 8,000 years agricultural civilization history country, Chinese culture and traditional social basis is deeply stamped with the brand of farming civilization today.

After nearly 70 years of rapid urbanization and industrialization, the Chinese countryside has gradually become the forgotten place. Large Numbers of migrant workers left the countryside and struggled to gain urban status. At the same time, urban real estate economy almost drained the rural resources. Facing the huge imbalance of urban and rural development, some scholars recalled Prof Shu Ming Liang 's views put forward half a century ago: One of the focal points of China's modernization process is to focus on rural areas and farmers.....the new direction that can make Chinese people excited in the next few decades is the rural construction movement. <sup>17</sup>As urbanization slows down with the coming problems as environment contamination and economics recession for nearly twenty years, rural construction has been up to the national strategy by the Chinese Government.

In October 2005, Chinese government proposed for the first time that Rural Revitalization with the requirements of development of production, well-off life, civilized rural style, clean and tidy village appearance and democratic management is the key part of the eleventh five-year plan. Since then, Provinces and cities have carried out the construction of new socialist countryside in response to the national requirements. In 2008, An Ji county, Zhe Jiang province formally put forward the beautiful countryside plan which proposed to build Anji county into the most beautiful countryside in China within 10 years or so. Zeng Cheng, Hua Du, Cong Hua and other counties in Guang Dong Province and Hainan Province also followed. In 2013, the 18th National People's Congress officially released Central no. 1 Document which clearly stated that the Beautiful village construction plan has become the national strategy of China. This can be seen as the symbol that China's rural construction has entered a stage of vigorous development. Then the Ministry of Agriculture and Industry issued opinions on carrying out the creation of beautiful villages and identified 1,100 villages as pilot sites for the creation of beautiful villages nationwide. President Xi Jin Ping further pointed out that the construction of beautiful countryside should pay attention to the inheritance of regional cultural characteristics of rural areas and evoke people homesickness when he investigated in Dong Shan village, Hu Bei Province in the same year. In 2015, the Guide to the Construction of

<sup>&</sup>lt;sup>17</sup> Lan Fang Liu.(2013) From beautiful countryside to beautiful China -- analyzing the ecological implication of beautiful countryside, theory monthly, No.9,165-168

beautiful villages, jointly drafted by the General Bureau of National Quality Inspection and other 9 companies, was officially released, which laid out specific standards for the evaluation of the construction of beautiful rural villages, which including 9 parts such as village planning, environment, economic development, rural style and culture. In this guide, the protection of rural regional culture is emphasized again.<sup>18</sup>

# 2.0 CHINESE RURAL REGIONAL CULTURE LANDSCAPE

It is obviously that the rapid development of industrialization, urbanization and modernization have formed a huge impact on rural regional in China. With the decline of traditional cultural features, urban and rural landscape gradually converged, bringing great challenges to regional cultural protection.



#### Figure1: The system of Traditional rural regional cultural landscape in China

In recent years, many scholars have carried out extensive research on this field and paid special attention to rural regional cultural landscape. Sun, a scholar at the Chinese academy of sciences put forward the concept of traditional rural regional cultural landscape and explained: It is the specific landscape type that exist in the specific rural area which forms and remains in the specific regional cultural background. It is the carrier of recording the history of human activities in rural areas and inheriting traditional regional culture in rural areas.<sup>19</sup> Researchers have reached a consensus that traditional rural regional cultural landscape has preserved a large number of historical landscapes in physical form and traditional customs in non-physical form, and formed a relatively complete traditional cultural landscape system together with the environment and the landscape intention formed by people's comprehensive perception. Although there is no clear description of the system composition at present, the author tries to analyse from five aspects: mode of production, way of life, history and faith, traditional technology and craft and Visual form. These extend specific landscape elements and constitute people's perception and recognition of traditional rural regional cultural characteristics. (Figure 1)

<sup>&</sup>lt;sup>18</sup> Yuan Lu, Ying Li, Pan Song (2016)Protection and inheritance of local culture in the construction of *beautiful countryside*. Journal of northwest a&f university (Social Sciences Edition), No.3, 69-74

<sup>&</sup>lt;sup>19</sup> Yi Hui Sun, Tian Chen, Yun Cai Wang.(2008) Research progress on traditional rural regional cultural landscape, *Progress in Geography*, No.6, 90-96.

# **3.0** APPROACHES TO RURAL REJUVENATION PRACTICE BACED ON REGIONAL CULTURE IN CHINA

Typologies are classifications which has been widely studied and applied in architecture and planning. The notion of type frequently has both functional and symbolic dimensions. Traditional architectural typology focuses on the extraction of prototypes such as modelling and construction while the new rationalist aesthetics with typology as its core clearly points out that design originates from the prototype but must go beyond it. Only in this way can history and reality, individual and society, particularity and universality be perfectly combined through the design process. Alvaro Siza, the famous Portuguese architect said in an interview that all the beauty of architecture comes from history, which confirms the importance of architecture in historical environment and even expresses that architecture can never surpass history, but only borrows and carries forward the meaning of history. Katherine Crewe and Ann Forsyth presented a typology of classification of six landscape approaches summarized by the acronym landSCAPES in 2003: design as Synthesis, Cultivated expression, landscape Analysis, Plural design, Ecological design or analysis process, main clients, the scale and so on. <sup>20</sup> These approaches were identified through an iterative process and the result presented a new typology research mode in the field of environment design.



Figure 2 The approximate location of the case mentioned in this article

<sup>&</sup>lt;sup>20</sup> Crewe, K. and A. Forsyth, LandSCAPES: A typology of approaches to landscape architecture. Landscape Journal, 2003. 22(1): p. 37-53.

APPROACHEST	O RURAL REJUVENAT goals	ION BACED ON REGIO	NAL Client/ audience	scale	intellectual base	approach to nature
Agricultural Diversity	Mode of production Drive economic growth by	Through the improvement of local traditional	Government Property developer	Large Usually are nonvisual scale	The agricultural economy Business model	People law the earth, the earth law the
	increasing productivity	industries to achieve spatial renewal	1 5			heaven, the heaven law the way, the way of
Build at the place	Way of life	Start with behavioural	Local residents	Large	General professional	Some ecological and
	Social behaviour analysis; Integral design. Improve	analysis, social research and field research	Property developer Government	usually are nonvisual scale	knowledge. Local knowledge	environmental protection concept,
	people's living standards	problem solving; interact with the users.				problems solving
Story telling	History and faith	Poetic idealization	Property developer	Varies	History, Artistic	The story of the
	Build regional culture characteristics	Stories telling	Private investor Government	from small to large, include visual and nonvisual scale	expression, literature and criticism	relationship between man and nature
Traditional	Traditional technology	From understanding to	Private investor from out of	Visual scale	Construction technology.	Nature is for man
T echnol ogy	Inheritance and	innovation. Focus on	town:	from small to medium,	Cultural heritage	
Renaissance	development of traditional technologies	materials and structure	Property developer	mostly are dominated by architectures	knowledge	
Design as	Visual form	Pictorial expression of	Government	Visual scale	Artistic expression	Artificial nature
Picturesque	Artistic expression of local physical form,	artistic conception, normally based on	Property developer	from small to medium	especially Modelling and composition skills	
	Improve regional feature recognition	pictures and drawings.				

Table 1 Approaches to rural rejuvenation based on traditional regional cultural Landscape.

Therefore, we can try to classify the design approaches of China's beautiful rural construction projects based on traditional rural regional cultural landscape from different dimensions. According to the above analysis of the five constitute aspects we can deduce five main design approaches: Agricultural Diversity, Build at the place; Storytelling, Traditional Technology Renaissance and Design as Picturesque. Although each case has a complex overlap in its approaches, but the starting point of design can be clearly defined. (Table 1, Figure 2)

#### Agricultural Diversity

Chinese traditional rural landscape has strong production characteristics because agriculture occupies a dominant position. According to natural conditions such as topography and climate, Chinese rural landscape gradually formed several different typical spatial forms to adapt to different production requirements such as farmland, breeding, forest and orchard, and animal husbandry and so on. The rice Terraces in Yunnan and the bamboo sea of Zhe Jiang are typical examples. Agricultural landscape shaped by production mode, natural conditions and human environment largely determines the basic spatial characteristics of regional landscape, while the continuous development of industry further strengthens the characteristics of regional culture.

An Ji, the earliest successful case of beautiful countryside construction in China, is developed with the bamboo and tea industry as the core to promote other industries like leisure tourism, biological medicine industry, green food, new energy new materials and so on. The bamboo industry generates an annual income of 6,500 yuan, accounting for about 60% of the farmers' income. White tea and tourism add about 4,000 yuan a year to farmers' income.<sup>21</sup> At the same time, the government organized various cultural activities and design competitions with bamboo culture as the theme, attracting designers from all over the world to participate in rural planning and renovation projects, some of which attracted more tourists.

Based on An Ji's successful experience, the Chinese government first proposed the concept of building "rural complex" in the Central No. 1 document which explain rural complex model should be the most important measure of new industry development of countryside now. It is said: We will support the development of rural areas where conditions permit, taking rural cooperatives as the leading force and allowing farmers to fully participate in and benefit from the comprehensive agricultural development model which including integrating circular agriculture, creative agriculture, and farming experience etc.<sup>22</sup> From this interpretation we can see that, the rural complex is not a new word, but an extension and development on the basis of the original ecological agriculture and leisure tourism. From the perspective of format, it is a comprehensive development model of agriculture + cultural innovation + new countryside, which is based on modern agriculture, driven by tourism, and mainly formed by aboriginal people, new inhabitants, and tourists.

The successful case in recent years is Wu Xi Rural East which invested by Oriental garden industry group of 5 billion Yuan in the construction, planned and designed by Orient Landscape in Jiang So province since 2013. The project covers an area of about 420 hectares which including 266 hectares of agricultural land, 67 hectares of cultural and tourism land and 87 hectares of residential land. Wu Xi is famous for its delicious peach in Chinese history; therefore the agriculture sector has rebuilt four modern orchards, which are peach production demonstration park, fruit facilities cultivation demonstration park, organic farm demonstration park, fruits and vegetables and aquatic breeding demonstration park. Many design companies subsequently joined this huge project like Qi Lan Architects, Village Vision Design etc and completed some popular spatial designs with attractive regional cultural features. Furthermore, the project has now recouped its investment and become profitable. (Figure 3) Another case is Xin Yang, where tea planting is the most representative of the region and have a history of more than 2,000 years. Yu Lu the Tea Saint of Tang Dynasty, listed Xin Yang as one of the eight tea districts in the book of tea. At present, the tea industry has become one of the main pillar industries in Xin Yang. Through the construction of tea industry and tea tourism parks, a number of ecological tea tourism parks and landscape belts will be created to realize the mutual promotion of modern agriculture and leisure tourism. Some villages do not have specific famous farm product so instead they developed integrated experiential agriculture. Take Lu Zhou Agriculture Cultural Garden in Anhui Province as example, this project focuses on four themes: farming culture experience, garden culture exchange, modern agricultural science and technology, and water world. It will be a modern Lu Zhou farming culture park

 <sup>&</sup>lt;sup>21</sup> Li Cai Wu, Kong Fan Wu.(2014) Four models of beautiful village construction and their comparison: Survey based on An Ji, Yong Jia, Gao Chun, Jiang Ning, *Journal of Hua Zhong Agricultural University(Social Sciences Edition)*, No109,15-22
 <sup>22</sup> Ministry of Grange of the Barghele Barghele of Ching (2017) National on an empirical survey of an empirical survey of the market of the Barghele of Ching (2017) National of Hua Zhong Agricultural University (Social Sciences Edition), No109,15-22

with modern agricultural technology, garden art products, facility horticulture, organic fruits, aquatic products, sightseeing and leisure and other related industries.<sup>23</sup>



Figure 26 Wuxi Rural east rural complex construction project, Yang Shan town, Jiangsu Province. (Source: Rural East official website( 2018)

Rural construction projects with agricultural diversity as the core give priority to industrial development and design landscape environment around industrial production mode and characteristics. For those rural areas with a better agricultural foundation, this is the main model advocated by the government at present.

#### **Build** at the Place

The contemporary theory of community participation and co-construction also profoundly affects the field of rural construction. In the situation of lacking outside investment, the progressive design that depend on local residents and respect their way of life might be the most effective and acceptable approach in China. The community design or plural design method advocated by western scholars requires designers to use a lot of sociological and behavioural research as the basis of design decisions, and even live with local people. This approach gradually developed new changes in rural China that designers may organize villagers to participate in building their own villages or leave plenty of space for them to grow.

The notion of build at the place, derived from Latin word Ad locum, was noticed and widely spread through Landscape Architect Sheng Yuan Huang's practice in Taiwan<sup>24</sup>. Since settling down in Yi Lan in 1993, Huang established field office working group, which has grown into a design group composed of nearly hundred people who had spent over 20 years to explore out the way of life. They claimed that design would not make the will of a few people swell and worked closely with Yi Lan in all aspects, from construction and design to historical heritage reconstruction, river regulation and urban planning, from the social welfare hall, west dike house bridge, to Jin Mei plank road, Luo Dong Wen chemical plant, cherry cemetery, etc. Jin Mei road in Yi Lan is the highest votes for best building award. One of the judges give reason: Using the original motor dealership Bridges to clever and simple structure, build a plank road on foot space, make the residents across Yi Lan river has a safe friendly corridor and communication space, highlighted the fine point of building from life, to reflect a level of consciousness of social care. The Qing He bridge, which connects the alleyways of Yi Lan to Jin Mei on the north bank, was originally a concrete bridge built during the Japanese occupation. Using an unconventional arrangement of transportation methods, designers constructed a new trestle of galvanized grilles, planks, steel frames and other materials, which were deliberately arranged inaccurately and irregularly, attached to the old bridge. Although the bridge is for people to pass through, Huang persuaded the local river bureau that the reason for the installation was to observe the pier safety

<sup>&</sup>lt;sup>23</sup> Fei Tang, Zeng Cheng Ding, Xiao Long King, Dan Shi, Jie Ren, Za Jun Liu. (2016) Study on the design and expression of regional culture in leisure agriculture garden planning, taking Lu Zhou agricultural and cultural garden in Anhui province as an example, Journal of Anhui Architecture University, Vol.24, No.1, (106-110)

<sup>&</sup>lt;sup>24</sup> Instructions. This paper respects Taiwan's independent political status, but culturally ascribes it to China.

and the river level. The person who crossing the bridge must cross the bottom of the concrete bridge, slowly get close to the water, turn to the other side of the bridge, and avoid the height of the river's 50-year flood line. According to his description, there is also an atmosphere of the whole environment -- light and water vapor pass through the bridge to catch the flowers and vines on the trestle path, swing is suspended under the trestle board, and steel pole ends on the side of the bridge are deliberately extended, like wind blowing reeds, echoing the distant mountains. (Figure 4).



Figure 4 Plank road of Jin Mei, Yi Lan, Taiwan, designed by Sheng Yuan Huang , Field office Architects(2005-now)

Rong Zhou, Professor of Tsinghua University said: The design has an Identity that surpasses the external form identification, that is, a field atmosphere with strong Authenticity. At the same time, this sense of 'being on the ground' has also become a very different local characteristic of Yi Lan from other place to a large extent.....at the place, when understood as a whole, best illustrate Huang's approach to design. The architect takes design as a means of accompaniment, which is represented in three dystopian characteristics: accommodating structure, harmonic causality, and presentational locale. <sup>25</sup> Under the influence of Huang, more and more mainland designers realized that they should learn or create the lifestyle for users in rural construction rather than trying to control everything.

#### Storytelling

Compared with the city, the rural population is smaller, and the environment is more closed and simpler which makes it easier to preserve the traditional culture of the region. On the other hand, it is human nature to seek out stories, listen to them even have the impulse to creative new stories. Although people think of themselves as rational animals, but always need emotional comfort. Therefore, people are eager to experience an completely different atmosphere from modern city life in the countryside and to understand different stories, sometimes even carefully constructed illusion like Disneyland. In China, many villages that lack of historical sites of authentic value choose to attract tourists by making dreams and have achieved success. Take Wu Zhen of Zhe Jiang province as an example, the investor, China youth tourism group, hired all the villagers of Wu Zhen to play the role of a reclusive, laid-back life. The environment of the village was designed to look like what people saw in ancient TV dramas with advanced and convenient living facilities which much better than reality. Some historical figures and stories were rewritten and beautified while people enjoy them. China youth tourism group replicated another Wu Zhen at the foot of the Simatai Great Wall in Beijing which named Gu Bei Water Town, has also achieved commercial success. Professor Matthew Potteiger and Jamie Purinton put forward the concept of Storytelling Landscape as a design approach in their book Landscape narratives in 1998. It is said: Places designed to tell specific stories with explicit references to plot, scenes, events etc. The stories may be existing literary or cultural narratives or produced by the designer.<sup>26</sup> Broadly speaking, all designs express meaning while Storytelling is an more impressive way closer to artistic expression.

<sup>&</sup>lt;sup>25</sup> Rong Zhou (2014) Architecture as Accompaniment: Huang Sheng-yuan,ad Locum and at Ease, Journal of World Architecture, No3,74-81

<sup>&</sup>lt;sup>26</sup> Matthew P & Jamie P (ed.) (1998) Landscape Narratives: Design Practices for Telling Stories, The Wiley Press, New York.

Moganshan, near Shanghai, is a popular case for rural revival in recent years which initiated from the Naked heart village project. The investigator and designer Grant Horsfield, a South African, made use of foreign stories to create or reinvent the regional context successfully and prompted Ming Su model popular all over the country. Now the Naked heart village has become internationally famous for its unique mix-cultural experience and was named the 45 best places to visit in 2012 by the New York times. The story starts from a Scottish doctor who move here a hundred years ago and these earth house with a thatched roof and the African pots everywhere persuade people to feel the nature completely. Horsfield's Chinese American wife, Kai Xin Ye, a professional architect helps him realized the story. He told the reporter through an interview in 2017: I always thought this product was a physical thing, but finally found that what I sold was a story about Africa. This combination of primitive life away from the city and modern high-end living facilities first attracted many foreigners in China, and then quickly became popular among the Chinese middle class in surrounding cities. Now the Naked series has become a super luxury holiday brand.

In remote areas that lack large-scale overall investment, designers use public art to enhance the quality of the environment and bring unique interest. Yu Bu Lu, an immigrant village, located in Gui Zhou Province is a natural basin with more than 600 meters elevation difference. Hundreds of years ago, the ancestors of the villagers migrated here from Jiang Xi province. The culture here mixed the characteristics and customs of central plains and the local minorities Buyi. At present, the original public buildings, and Spaces of the village, such as sacrifice, discussion, gathering, entertainment, and other functions, have been degraded and disappeared, making the village composed of only one living function lose the rural vitality brought by the organic and complex structure. In July 2015, Yu Bu Lu was designated as a demonstration site of beautiful village in prefectures and cities for renovation, and entrusted Lv Pin Jing architectural design studio of the Central Academy of Fine Arts to be responsible for the overall repair, protection and optimization design of the villages organically integrated with the natural environment and the relationship of architectural communities with rich levels. Through the demolition and reconstruction of individual buildings, new public activity areas are constructed to form a public space system integrating earth temple, mountain temple, Guanyin temple, Wang Xiang platform and other sacrificial places with Ban Shu square and Chen clan ancestral hall in the centre. The transformed public space has also become a favourite gathering place for villagers, and villagers begin to actively participate in public affairs and collective activities.

On the other hand, these architects chose an artistic strategy to express the character and story of the site infectiously, created a batch of agrestic breath organic combination with the modern concept of environmental art, such as straw tower floor drains Heaven pit, mountain gate, stone package tree, etc. In the language of art will humanity into the nature and rural landscape, rich in the appreciation of traditional villages, experiential and artistry, More highlight the cultural value of traditional villages. (Figure 5).



Figure 5 Art works of Yu Bu Lu Village, 2016 (Source: Yonmei public sculpture art studio (2016) Yu bulu village in guizhou province

#### Traditional Technology Renaissance

Traditional building materials play an important role in maintaining villagers' historical complex and continuing traditional context. Making use of local materials according to local conditions is a kind of respect and adaptation to regional resources and environment, The use of local materials can highlight the regional characteristics and continue the historical memory, so as to form an architectural cultural landscape with rich features and a sense of unity.<sup>27</sup>

Wang Shu, winner of the Pritzker prize for architecture in 2012 believes that China's true traditions are in the hands of migrant workers and skilled builders. Protecting and inheriting the traditional building construction technology and culture, in line with the local villagers' aesthetic habits, can enhance the villagers' sense of identity, enhance the rural characteristics and local flavour. The first rural rejuvenation project accomplished by Wang Shu is Wen village, located in Dong Qiao Town, Fu Yang district, Hangzhou, Zhejiang Province. The form and materials of the building are imbued with the architect's strong personal style. The pattern of rebuild houses is designed for three generations of a family. The old live on the first floor and the young live on the second and third floors. There is no connection between floors, which avoids the contradiction caused by different living habits while the communal space such as patio keep the intimacy.<sup>28</sup> In this case, the architect did not improve the traditional buildings structure so much as simply using the local material. There are lot of redundant expression like double wall of grey brick, subeave bamboo structure without supporting function and so on.

Due to the low degree of industrialization, many rural areas in China still preserve and use traditional architectural techniques and manual product manufacturing process which may produce special aesthetic effect. Through simple improvement of materials and techniques, the designers can complete large-scale construction projects at a very low cost but with modern style. Through close cooperation with local villagers, the designer established emotional bonds and enhanced the sense of belonging of local residents.

<sup>&</sup>lt;sup>27</sup> Yi Hui Sun, Tian Chen, Yun Cai Wang.(2008) Research progress on traditional rural regional cultural landscape, *Progress in Geography*, No.6, 90-96.

<sup>&</sup>lt;sup>28</sup> Chen Zhao (2016) The cognition and principle of the current Chinese rural Renaissance. The architects, No5, 8-18.

Shang village is located in Jixi County, An Hui province, has become desolate for a long time because of young people working outside. The government decided to reactivate the village from rebuild a public place, which will use the old abandoned collapsed courtyard of Family Gao. In this project, the designers have absorbed local techniques for making umbrellas, but replaced them with a more durable material called bamboo steel. The other part, such as site cleaning, material collection, and such traditional construction skills as the reinforcement of the hollow mud wall, the masonry of the head wall, and the masonry of the stone wall, were left to the village artisans to complete. In the process, the local bricklayer master played an amazing traditional craft: the Horsehead wall, just like the wall of the old house. The bamboo umbrella propped up with six vaults covered space, for the villagers and tourists have a chat, entertainment party public space, and the villagers assembly activities, the function of the village history and culture exhibition hall. (Figure 6).



Figure 6 Bamboo Hall of Shang Village, AnHui Province, Built by local villagers,2017 (Source: Gooood (2018) Zhupeng township hall - shang village Available from: <<u>https://www.gooood.cn/village-lounge-shangcun-china-by-sup-atelier.htm</u>> (accessed 28 August 2019).

#### Design as Picturesque

As picturesque in England Landscape design history, Chinese people built their living environment according to paintings and poetry which called poetic and picturesque emotion. This inherent tradition still has many followers today, especially in the field of rural construction. This design approach reflects an ideal cultural or misreading from the perspective of the intellectual class, because farmers do not think of rural landscapes as poetic or artistic.

Dong Zi Guan is the most typical rural rejuvenation design practice that has been praised and won numerous awards in recent years. The designer Fan Hao Meng explained the main idea of his creation came from Guan Zhong Wu' Paintings: The characteristics of the traditional folk houses is not only a wall, Shi Ku Men, open roof the representational symbol, is more attractive than white wall tiles, elegant tonal behind sends out a temperament of the collect inside of that kind of wen wan, as expressed in Wu's watercolours, slightly bent and the roof of the elegant line and solid wall.....<sup>29</sup> Like most rural construction designs, Meng and his group also pay much attention to the business operation model ,for they agree that it is difficult to maintain long-term development just by creating beautiful scenery. (Figure 7)

Another case located in AnJi, Zhe Jiang Province, where is famous for its beautiful bamboo forests and long history of tea. The local government hopes to promote economy through design and has held several design competitions with the theme of bamboo construction to expand its popularity, attract investment and tourism. The latest winner work is the twin's

<sup>&</sup>lt;sup>29</sup> Fan Hao Meng.(2016) Abstract and reconstruction -- an exploration on the design strategy of Hang Zhou Dong Zi Guan rural residence. *The architects*, No5.57-64.

mountain tea house designed and built by the teachers and students team of Tsinghua university. They explain their concept come from a famous picture enjoy alone garden which painted by Yin Qiu, one of the Ming four outstanding painter: Qiu expressed the perfect construction form of bamboo – enjoy oneself, and the perfect way to drink tea -- resting under the tree. By using the bamboo characteristics like light and easy to bend, the leisure space closely related to the body is constructed, and the leisure artistic conception of tea tasting under the bamboo forest is created. Starting from such an artistic conception of tea tasting, a continuous double-pitched roof is designed, with one side opening towards Phoenix mountain with the best scenery, bringing in natural wind and light through the round hole, and the other side opening completely as the main entrance. Enjoy alone garden was designed and constructed by the great literati Guang Sima of Song dynasty, has become a recurring theme in Chinese painting history. This aesthetic image comes from the peach blossom land, which typically reflects the Chinese ancient literati's desire to live in seclusion and stay away from dark politics.



Figure 7 above: Fu Yang Dong Zi Guan village, Hangzhou, designed by Meng Fan Hao; below: The Ancient water towns in Southern Yangtze River painted by Wu Guan Zhong. (Source: Good (2017) Contemporary rural settlement --Hangzhou Fu Yang Dong Zi Guan returned to rural residence Available from:<<u>https://www.gooood.cn/contemporary-rural-cluster-</u> <u>dongziguan-affordable-housing-for-relocalized-farmers-in-fuyang-hangzhou-by-gad.htm</u>> accessed 28 August 2019).

4.0 CONCLUSION

After the Beautiful Village plan was officially listed as a national key development strategy in 2013, a large number of rural construction projects of various types emerged across the country, becoming a new hot spot in the field of design. China's countryside is the world's largest agricultural country with the longest history that are rich and diverse with unique features. They are valuable cultural treasures and should not be replaced or reshaped by modern popular culture and consumer culture. More and more Chinese scholars agree that regional culture is the most valuable content in the practice of rural reconstruction, as Prof Lu said: Organic fusion to local culture protection and rural construction is the core of the "Beautiful Village Construction". We should aim at inheriting local culture as the cutting point and avoid destructive construction.....to build livable home with spiritual sense of belonging.<sup>30</sup>

On the basis of the five aspects that constitute the system of the traditional regional cultural landscape in China, we can further classify and analyse the approaches of rural rejuvenation design practice. From the perspective of typology, it may be helpful for decision makers and designers to choose the starting point of project practice, chart out areas requiring reflection or research and direct the education of designers towards distinction in specific skills to be more effective. In most design practices, these approaches overlap or correlate with each other whereas the comprehensive balance of all aspects of regional culture should be achieved eventually.

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# INVOLVING RURAL CHILDREN IN CO-DESIGN PROGRAMS: EDUCATIONAL EXPERIENCES AND DEVELOPMENTAL BENEFITS

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**Abstract:** This paper draws on data from three architectural co-design projects between Deakin University and rural schools in the Geelong region. It investigates how co-design projects provided unique educational experiences to children and looks at the implications of them on children's development. Each project had a slightly adjusted program to accommodate the lessons learnt from previous projects. The findings showed that children who were involved in the co-design workshops had the opportunities to experience university life, learn architectural skills and literacy, and were inspired to discover new meanings and expectations of their lives.

Keywords: co-design; children; architecture

# 1.0 INTRODUCTION

#### 1.1 Rural Disadvantage

Compared with city dwellers, populations in rural and remote areas of Australia have traditionally been disadvantaged regarding employment opportunities, formal education, income, service provision and access to welfare assistance (Tonts & Larsen, 2002). As a vulnerable social group, children, and youth in rural areas of Australia face limited access to education, training and work experience placement (HREOC<sup>31</sup>, 2000). According to data from OECD<sup>32</sup>'s Programme for International Student Assessment, Australia has one of the largest urban/rural achievement gaps among developed countries (OECD, 2013).

Previous studies have consistently suggested that rural educational disadvantage was related to the lower socioeconomic status (SES<sup>33</sup>) of rural students (Williams, 2005; Sullivan, McConney & Perry, 2018). Student SES is positively associated with educational resources, experiences, and opportunities, both at home and at school, and these in turn are related to academic achievement (Bourdieu & Passeron, 1990). At home, students with higher SES backgrounds are provided with more books, computers, and other educational resources (Orr, 2003), and they are more likely to experience a stimulating learning environment (Nash & Harker 2006). At school, students with higher SES backgrounds are more likely to attend well-resourced schools and are more likely to have experienced and qualified teachers with high expectations (Orr, 2003; OECD, 2005). In addition, high-SES students also benefit from participating in educational activities that increase their performance and navigation in the educational system (Bourdieu & Passeron, 1990).

Although SES remains the strongest correlational factor of rural disadvantage, cross-national research from OECD (2013) found that rural/urban achievement differences are not fully explained by student SES. Instead, educational outcomes are influenced and medicated by a complex web of factors derived from multiple sources such as family, peers, community, schools, and the dominant culture within a society (Sullivan, Perry &

<sup>31</sup> HREOC represents 'Human Rights and Equal Opportunity Commission'.

<sup>32</sup> OECD represents 'Organisation for Economic and Co-operation and Development'.

<sup>&</sup>lt;sup>33</sup> SES in this paper is defined by wealth, parents' education, parents' occupation and parents' income (Easton-Brooks & Davis, 2007).

McConney, 2013). For example, there are evidence that self-aspirations, access to knowledgably mentors, and participating in activities helped low-SES students combat socioeconomic disadvantage and achieve high educational attainment (Johnstonbaugh, 2018).

# 1.2 Collaborative Design with Children

In 1977, findings from UNESCO<sup>34</sup>'s 'Growing up in Cities' project suggested that children should be involved in the design and construction of the settings intended for them (Lynch, 1977). In 1989, the United Nations adopted *Convention on the Rights of the Child*<sup>35</sup>, which claimed that children should access the full range of human rights, especially the rights of inclusion and participation. Since its adoption, the *Convention* has been accepted by every country in the world, except one, making it the most widely ratified human rights treaty in history (Liefaard & Sloth-Nielsen, 2016). In light of the Convention, there have been international initiatives that involved children in urban planning and architectural design across the world such as *Child Friendly Cities* (Riggio, 2002; Wilks, 2010) and *Growing up in Cities* (Chawla, 2002). Reflecting on the collaborative design projects, a solid body of research has been published on the theories (Hart, 1992; 1997), methods (Hanssen, 2019; Lozanovska & Xu, 2013), tools (Driskell, 2002; Bakr, Ei Sayad & Thomas, 2018) and findings (Horelli, 2001; Xu & Izadpanahi, 2016) of collaborative design with children.

Previous studies have consistently suggested that co-design is an effective tool to empower children and young people. It fosters an intrinsic sense of self-esteem and self-efficacy and prepare them for citizenship (Chawla, 2002). What's less clear is their developmental implications on the participating children: what are children's experiences, what skills did they develop from these co-design programs, and how did they change children's perceptions of themselves. In this paper, we will investigate co-design projects from these angles.

# 2.0 RESEARCH CONTEXT

# 2.1 Geelong, Australia

Geelong Region is in south-western Victoria, Australia; between 75 and 160 kilometres from Melbourne (as shown in Figure 1 & Figure 2). It has a population of around 350,000 people and covers almost 9,000 square kilometres of land. The name "Geelong" is derived from the aboriginal word of "Jillong", which means "bay", "ocean", or "a place of the sea bird over the white cliffs" (Xu, Elkadi & Leao, 2011; Carbines, 2019).



<sup>34</sup> UNESCO represents United Nations Educational, Scientific and Cultural Organization.

<sup>&</sup>lt;sup>35</sup> Convention on the rights of the child will be referred to as the 'Convention', here and after.

# Figure 1: A map of Geelong

Geelong region consists of many coastal and rural regions and is well known for its Great Ocean Road and some of the best surfing beaches in the world. It bases its economy around education, health, research, manufacturing, tourism, service, and other industries, and offers an attractive lifestyle and living choices in its coastal towns (Carbines, 2019).



Figure 2: Aerial view of Geelong CBD

Despite its economic and population growth, Geelong region has many rural and regional communities that are identified as the most disadvantaged suburbs in Victoria, suffering from social isolation, inadequate access to health care facilities (Rooney, 2016), high rates of unemployment and crime, drug, and violence use (Dundas & Ainsworth, 2015; Editorial, 2019), as well as natural disasters such as bushfires, floods and droughts (Tippet, 2019).

# 3.0 RESEARCH QUESTIONS

The School of Architecture and the Built Environment of Deakin University is in the Geelong city and has been constantly involved in collaborative design projects with schools in rural and regional communities of the Geelong Region. These co-design projects were warmly embraced and well-received by local schools. In 2012, the school principal wrote to us: "Northern Bay P-12 seeks to improving student retention at school by providing an innovative, supportive and responsive learning environment to help students overcome challenges, achieve better academic outcomes, expand personal potentials and rise from poverty...I think it is a great idea to have architectural staff and students work with our students on architectural design projects."

The data from co-design programs of Deakin University offers a unique opportunity to look at the developmental implications of co-design projects on participating children. Drawing on a rich body of research data collected in 2000, 2011 and 2012, this paper looks at how co-design programs help children combat rural educational disadvantage and improve educational outcome. The questions we want to ask are:

- What were the resources and experiences these co-design projects provided to children?
- What skills did children learn from these co-design projects?
- What were the developmental implications of these co-design projects on children?

# 4.0 **RESEARCH METHODS**

Three methods were used in data collection: (1) Observation of children's behaviours and experiences during the design workshops, (2) Analysis of children's design portfolios including drawings, models, and writings, and (3) semi-structured interviews of schoolteachers and architecture students. The nature of this research is flexible: studies that can be done using simple techniques in any situation, and can be easily modified to suit interests, conditions and priorities (drawing on implications from Lynch, 1977).

Content analysis and thematic analysis were used to analyse the data, and the findings were presented in the forms of images and texts.

# 5.0 THE THREE CO-DESIGN PROJECTS

Three collaborative design with children projects were analysed in this paper. All of these three co-design projects used fictional inquiry – creating fictional situations, artefacts and narratives - as the technique to stage the co-design programs, as many previous co-design projects have proven that this is an effective technique to stage the collaborative design situation and stimulate children's design activities (Dindler and Iversen 2007; Dindler 2010).

These co-design programs were executed over a span of four to eight weeks, and the participants' numbers ranged between 40 to 180. The programs all started with a lecture, during which an university lecturer talked to children about 'what is architecture'; followed by several weekly design workshops where university students paired up with children in small groups to develop the design proposals; and finished with a design review and exhibition. In each project, architecture students and children formed small design teams and worked as design partners. Children drove the design ideas and architecture students filter, scribe and represent their design ideas (Lozanovska & Xu, 2013). By encouraging genuine design partnerships, we witnessed how children's imagination and architecture students' creativity inspired and complimented each other to achieve outstanding design outcomes.

# 5.1 Project 1: One World, Two Cities

Project 1 had a four-week program and it aimed at designing a playground for Wales Street Primary School. In 2000, 90 first year architecture students from Deakin University and 90 Grade 3 and 4 children from Wales Street Primary School participated in this project. This project was incorporated into the educational curricula of both institutions. The participants formed 30 design teams, each consisting of three architecture students and three children.

The fictional theme of 'One World, Two Cities' was used to stage the design situations and inspire children's imagination. In this fantasy world, there was a Black City and a White City, co-existing. The idea was inspired by 'Yin and Yang': Polar opposites or seemingly contrary forces that are interconnected and independent in the natural world. The Black City represented the underworld, which was secret, subconscious, invisible, nocturnal, real, and earthly. The White City represented the visible and conscious world, related to presentation, dressing, masks and illusions, and of higher realms and heavenly.

The playground was comprised of 30 fragments: six bridges, two tunnels, one railway line, five spires/towers, two embankment walls, one bat-cave, two entry systems, two pathways with lights, one maze, one city stair, three secret cells, two suspended magic walls, one river and one mountain. Each team picked one fragment of the playground to work on and explored the chosen fragment in the forms of drawings and models. Through a series of workshops, the teams developed their design ideas, using the media that the team members were most comfortable with (drawings, models, storytelling, computer, etc.) to explore and present the design ideas. The final product of this project was a 1:20 scale model of the playground (Lozanovska 1999; Lozanovska & Xu, 2013).

There were three sequential stages to this project: (1) Preparation (Form design groups & explore the fantasy city ideas); (2) Design Development (Develop the playground fragments through drawings, models, and storytelling) and (3) Exhibition & Design Review.

# 5.2 Project 2: Dragon and Its Shelter

This project has an eight-week program and it aimed to design some play structures for Roslyn Primary School. In 2011, 12 architecture students from Deakin University and 48 Grade 5 and 6 children from Roslyn Primary School participated in this project. This project was incorporated into the educational curriculum of Roslyn

Primary School, while architecture students from Deakin University participated as research volunteers. The participants formed 8 design teams, each consisting of one architecture students and six children. A two-hour design workshop was organized on each Thursday afternoon during this project.

The fictional theme of 'Dragon and its shelter' was used to stage the design situations and inspire children's creativity. In this fantasy world, there were dragons living in Roslyn Primary School and they built different forms of shelters in the school. Children were encouraged to explore the fictional theme and imagine dragons in different forms and possibilities.

At week five, the dragon model built by one design team was chosen through a voting process. According to the story written by this design group, it was a dragon from another planet, who was injured and landed on the playground of Roslyn Primary School. The dragon became friend with the children, and he shed his skin for children to play on before he returned home (pages 246 -247, Xu & Izadpanahi, 2016).

The dragon skin, in the shape of a dragon, became the basis of the play structures. It was then divided into eight parts (in the shapes of a dragon's head, neck, tail, etc), and each design team picked one part to work with. Each design team then defined the function, location, and size of the chosen body part of the dragon; and developed it into a play structure (Izadpanahi, Xu, Elkadi & Ang, 2012; Xu & Izadpanahi, 2016).

There were four sequential stages to the project (Figure 3): (1) Introduction to Architecture (Children had a lecture about architecture and learnt to build some famous buildings from newspapers; (2) Sketch Design (Children were encouraged to explore their ideas of dragons and shelters through sketch drawings and models; (3) Exhibition (An exhibition was held at Roslyn Primary School, and one of the dragon models was voted as the most popular by students and visitors; and (4) Design Development (Children were guided to choose a site and draw architectural views to represent the play structure).



Figure 3: Program of 2011 "Dragon and its shelter"

# 5.3 **Project 3: Black & White City**

Project 3 aimed to design a fantasy city urban intervention inserted into the current fabric of Geelong CBD. We used the same fictional theme as Project 1 - 'Black & White City' - to stage the design situations and inspire children's creativity. The project explored both imaginative and realistic dimensions, in that the urban intervention was inspired by the fantasy of Black & White City, yet it existed as a manifest and tangible entity entailed through site, scale and materials in Geelong CBD.

During November and December 2012, ten Deakin architecture students worked with thirty Grade 6 - 8 children from Northern Bay College on this project through a five-week program. They formed five design groups, each consisting of two Deakin students and six Northern Bay students. By the end of week four, each group was expected to achieve (1) A model of the urban intervention, presented in the size of 1 - 4 square meters (the scale can be different depending on the design); (2) A poster, using the technique of photo montage, showing the relationship between the urban intervention and the existing Geelong City. On week five, a design review and exhibition were hosted in the gallery of School of Architecture and the Built Environment of Deakin University (Mcgibbon, A, 2012).

There were three sequential stages to the project: (1) Forming Groups & Sketch Design; (2) Design Development; and (3) Exhibition and Design review.

# 6.0 FINDINGS

Children who participated in these co-design projects were provided unique educational resources such as talks from university lecturers, tutorship from university students, and architectural drawing and modelling materials provided by research funding. Through a series of design workshops, children developed architectural skills and literacy including site analysis, drawing, modelling, measurement, calculation, and presentation. In

addition, they found role models in architectural students, which inspired them to think about themselves differently and start to have different expectations of their futures.

# 6.1 Children Get to Experience the University Life

Comparing to adults, children are more limited in their range of movement, while they have greater hunger for stimulus as their growth feed on it. Attractive spaces, where interesting activities can be seen or engaged in, should be made accessible to children. This will reduce their boredom and deepen their development (Lynch, 1977).

The co-design projects made the university setting accessible to children and gave them the experiences of a spectrum of places, people and activities. During the co-design projects, all the participating children had the opportunity to travel to Deakin University by school buses. They worked with Deakin university staff and students in the design studios, laser-cutting workshop and gallery. In 2012 'Black & White City' project, we even hosted all the co-design workshops in Deakin's design studios (Figure 4).



Figure 4: Children worked in the design studios, laser cutting room and gallery

Asked to talk about their favourite part of the co-design project, children repeatedly mentioned their visits to Deakin University such as 'I really liked the excursion' and 'I really liked going to Deakin Uni'. They wrote about the design studio they visited and the architectural models they saw: 'We saw the room where the architects study...there, we saw some of the models they were working on'; "Leon<sup>36</sup> showed off some of the sculptures that the (architecture) students made, and then we went into the classrooms they were like ten times bigger than (our) classrooms'.

# 6.2 Children Learnt Architectural Skills and Literacy

Teaching children design skills and literacy was the main reason that motivated school principals and teachers to support our co-design projects. In 2011, responding to the invitation letter from Deakin University, a school teacher wrote back: "As primary teachers we are always thinking about new ways to get an idea across or to engage our kids...we thought about getting the kids to come up with a design for something, it could be our school grounds, a playground, a skate park or a garden development...what we would love is for someone or some many to sit with the kids for an hour or so a week and to show them how to draw a plan, how to represent a tree, to work on sale and to look for ideas, pitfalls etc, things that are needed when it comes to planning and developing an idea and even eventually building it..." In 2012, responding to an invitation letter from Deakin University, the school principal responded saying that he wanted to 'build design skills and literacy for the participating children, thus empower them as potential environmental designers.'

# Site analysis

A site analysis is a research activity that looks at the existing conditions of a project site prior to starting any design, which enables the designer to weave the new design with the existing fabric of the site. Site analysis enables the designer to work out a design solution that responds to the location, context, physical features, as well as human and cultural characteristics of the site. Each architectural work and its site mutually influence

<sup>&</sup>lt;sup>36</sup> To comply with Human Ethics requirements from Deakin University and Department of Education, pseudonyms were used in this paper on all the participating architecture students and children.

each other, and their relationship remains constant (Mahdavinejad, Shahrigharahkoshan & Ghasempourabadi, 2012).

During the 2011 'Dragon and It's shelter' project, children went for several walking tours around the schoolyard and chose their favourite places as the locations of their future design. During the walking tour, they talked about what they liked about the school and what they would like to see in the future. With the help from architecture students, they also drew plans and sketches of the chosen sites (Figure 5).



Figure 5: Picking sites and draw maps

Prior to the first workshop of 2012 'Black and White City' project, architecture students went for a site visit without children for safety and logistic reasons. During the first workshop, they printed maps, satellite images and photos of the site, which helped children understand the physical and cultural features of Geelong City. With these visual aids, children talked about their understandings of different areas of Geelong City and started to draw sketches on maps to indicate the locations of their design (Figure 6).



Figure 6: Analysing the site of Geelong City through photos and maps

# Sketching and Modelling

Conceptual design is the phase where designers start developing ideas, coming up with a proposed scheme and possibly moving to another one. For most architects, sketching and modelling are the means by which design imagination and critical thinking intersect during conceptual design process (Bilda, Gero & Purcell, 2006).

In the co-design projects, we encouraged children to draw sketches and build sketch models to explore their initial design ideas. For example, in 2011 'Dragon and its shelter' project, children were encouraged to draw their imagined dragons on tracing paper and build sketch models of the dragons using play doughs and other materials (Figure 3). In 2012 'Black & White City' project, children drew sketches of their imagined urban intervention and built sketch models using cardboard boxes. After the design concepts have been formed, architecture students drew up the model pieces in CAD and sent the CAD files to laser cutting machines.

Following that, the MDF boards were finely cut into pieces, and children helped build the final presentation model.

We found that children were quite capable at drawing sketches and building sketch models. In addition, sketching and modelling provided a media for architecture students to translate and interpret children's design ideas. For example, in 2012 'Black & White City' project, one design team proposed 'In-Between' as an urban intervention to Geelong city, which is an ovoid-shaped structure to be hung in between the existing buildings to provide a space for retreat. We can clearly see the link between the initial sketches (Figure 7), the sketch model and the final MDF model (Figure 8).



Figure 8: Sketch model and presentation Model of 'In-Between'

#### Measurement

We tried to teach children architectural measurement by measuring human bodies, and we found that most children were able to learn this technique. We asked each group to find the tallest child in the group and measure his or her body including arm span, shoulder span, and heights from floor to shoulder (Figure 9). With the help of architecture students, some children also measured classroom furniture to understand the relationship between the size of human body to the environment around them.



Figure 9: Children learnt to measure human bodies and classroom furniture

After the measurement, children wrote down the dimensions in their journals. Some children who were strong at maths were encouraged to calculate the mean average of the measurements of different people and set it as a 'benchmark'. Other children who were good at drawing were encouraged to draw diagrams to illustrate the measurements.

#### Architectural Drawings

In contrast to the free hand sketches that were used to set out the designer's thoughts on the fly (Suwa, Gero & Purcell, 2000; Bilda, Gero & Purcell, 2006), architectural drawings were developed for the purpose of construction, which communicate a building's form to its builders (Scheer, 2014). Plans, elevations and sections can be imagined as mentally slicing the building and imprint the elements in the cut plane on a piece of paper (Scheer, 2014). Drawing skills of an architect takes years to develop.

During Week 7 of 'Dragon and its Shelter' project, we tried to teach children the concept of architectural views and the technique of drawing to scale. We asked each of them to represent their playground structure by a scaled drawing. It turned out that most children were keen to learn but struggled to understand the concept of architectural views and had difficulties to learn this drawing technique.

For example, one architecture student wrote in his field note: 'Nick maintained his attention to detail and focused on buildability, including structural details...he finalised a good elevation working drawing on yellow trace...Naomi worked on her design a little more and was quite intent in wanting to learn how to scale the irregular form, by using the X and Y axis method... she also produced an elevation with its yellow trace copy...Jack was intended in learning how to draw the irregular shape to scale...he does not think as methodically as Nick but nonetheless was very engaged in the process...Terry primarily showed no real concern or regard to the concept of "scale drawing"...he would put his graph paper on the floor and persist in sketching freehand ideas in his journal...Generally, the group's understanding of scale and measurement was poor, and much work was needed to develop even slight understanding. Their skills of simply ruling a straight line with use of a ruler were also rather clumsy...' (Figure 10)



Figure 10: Most children's drawings showed very limited understanding of architectural views and scales

Because of the struggle and frustration of failing to teach children to do scaled architectural drawings, architecture students gathered around after the workshop to talk about their experiences. A student said: "Today was awkward...how can I get them to understand size and dimension in relation to the strange shape...it's very difficult at this stage"; another architecture student added: "Section is so difficult...it's so confusing even for us".

# 6.3 Children Found Role Models in Architecture Students

Children see Architecture Students as 'Role Models'

'Working with the kids were very enjoyable...especially some of them were like...they looked up to you as a student...I don't know, in a way, say the girls were just following me around, they really looked up to me... they asked me all these questions like 'what do you do', 'where you come from' and 'how did you get there', like they wanted to, ah, it was like I saved a future path for them... you could see everything that has in them.' – Olivia H<sup>37</sup>, a female architecture student who participated in 2012 Black & White City project.

Role models refer to important figures who have a significant influence on a child's life. Role models serve several functions related to support and inspiration, help orient children toward their futures, and promote optimism and the discovery of meanings in their lives (Chen, Lee, Cavey & Ho, 2013).

<sup>&</sup>lt;sup>37</sup> To comply with Human Ethics approvals from Deakin University and Department of Education, pseudonyms were allocated to all participating architecture students and children.



Figure 11: Children and architecture students working together

Participating in co-design projects gave these children the opportunities to work with talented architecture students (Figure 11), who motivated and inspired them to look at the world differently, discover meanings of their lives, and set different expectations for their futures.

# 6.4 Children were Inspired to Think about a Future in Architecture

Working with architecture students has motivated many children to want to learn more about architecture, and even inspired some of them to see a future path in architecture. For example, at the end of 2011 *Dragon and its shelter* project, some children wrote to us saying: "I really like all the architects"; "I enjoy architecture and designing things"; "I've loved learning about architecture and would like to learn more"; "I really like this program and it's getting me thinking that I want to be an architect"; "I think that next time we should be able to design buildings ourselves".

# 7.0 CONCLUSION

Children in rural Victoria have long been suffering from socio-economic disadvantage, educational disadvantage, sense of alienation and powerlessness. Increased access to global information through various media forms (such as internet and TV) has served to exacerbate the sense of powerlessness: Children are able to see what is possible and occurring elsewhere but have little active engagement.

This study analysed three co-design projects between Deakin University and rural schools in Victoria. The aim of the co-design projects was to empower children through involving them in collaborative design programs. We found that the aims of the design projects were well met, and we argue that co-design is an effective tool to help rural children find ways out of poverty and indignity.

Through co-design projects, children had the opportunities to visit School of Architecture, Deakin University and experience university lives. They worked in the design studios, visited laser-cutting workshop, and presented their design in the university gallery. The university setting provided educational resources and experiences that they did not have access to otherwise. Being able to get access to these university resources and experiences is one powerful step of helping these children navigate and challenge the educational system and strive for better educational attainment.

In addition, children had the opportunities to learn architectural design skills and literacy. Although most of them struggled to learn the architectural skills that involved abstraction (such as architectural views and drawing to scale), they were quite capable to practice and learn the skills that involve concrete manipulation including site analysis, drawings, and sketches, assembling architectural models, and measurement. These skills complimented their existing skill sets and empowered them as potential environmental designers.

Moreover, many children found role models in Deakin university architecture students, who were young adults with high levels of intelligence, skills, and aspirations. Research has found that low-SES students rely on

knowledgeable mentors for guidance and activities needed to navigate the education system (Johnstonbaugh, 2018). Being able to work closely with and get to know Deakin architecture students inspired children to look at their lives and think about their futures differently. Therefore, we believe co-design projects brings out positive developmental outcomes for the participating children.

#### HUMAN ETHICS APPROVAL DECLARATION

The projects presented in this paper were approved by Human Ethics Advisory Group of Deakin University (STEC-32-2001-XU) and Department of Education and Early Childhood Development (2011-001336 and 2012-001671).

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# **RE-INVENTORY OF INDIGENOUS VILLAGES OF BALI AGA, A STUDY OF SOCIO-CULTURAL AND ARCHITECTURAL FOR CONSERVATION OF TRADITIONAL ARCHITECTURE AND HERITAGE IN BALI**

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**Abstract:** The research examines the Indigenous villages or Bali Aga in Kintamani that adopt the original culture, and traditional architecture. There is a significant change especially in architecture implementation of traditional houses in the villages. The research seeks to re-invent the Indigenous villages to consider the study of the community including socio-cultural and architectural for conservation purposes. The research uses a qualitative method through observation, interviews, and depth literature review to obtain the information of socio-cultural and traditional practices in the villages. The research founds there remain traditional styles of houses although there are many changes in the house appearance from traditional into modern.

Keywords: re-inventory; Bali Aga; conservation; Indigenous and heritage; Kintamani

# 1.0 INTRODUCTION

The Indigenous Villages called Bali Aga are located mostly in the North of Bali Island. These Bali Aga communities significantly apply the genuine culture and tradition into their life and traditional architecture which differ to other villages in the South part of Bali. The villages in the southern part of Bali were affected from the Majapahit Kingdom era, while the Bali Aga was not affected. There was a study regarding Indigenous Villages of Bali Aga in 1989 by Public Work of Bali Province that inventoried approximately 38 villages across the island. Other scholars from local and overseas also depict their research through photograph books, book researches, and other research publications. The documentation and inventory have been done by the Bali Province approximately 30 years ago. To address this, the research aims to re-inventory the extant of Bali Aga in Kintamani remembering there was no updated of the existence of the Bali Aga for 30 years. The grand tour founds there a significant change in architectural of traditional houses into modern style. Further, there a shifting of socio-cultural of Bali Aga villages caused by economic and technology development. However, it can be stated that the Bali Aga still strongly adopt the original socio-cultural and traditional practices in the community.

The methodology of this research is using a qualitative method, data collected through observation to get valid information about the Bali Aga village's condition in Kintamani regarding the socio-culture of the community and architecture of the village. The interview was conducted to the elders of the village to gain deep information about the village socio-culture that originality of Balinese culture. The literature review was used to gain better information regarding the village history, norms, traditions that relate to the intangible aspects of the village. The research also used the previous research to compare the condition in the past and current time, to understand how far the changes happened. Research from Muller (2011) gives information from her fieldwork in the year 1980s, and the inventory from Bali Province in 1989 described the existence of architecture of the houses in the year 1990s. The data present through descriptions, pictures, tables, and diagrams to explore the Bali Aga village's condition. The research conducted in eleven villages along the Kintamani area which selected through random sampling due to the condition in the field of research including time, accessibilities to the villages, and the ease of meeting to the elders. The data was analyzed through the qualitative description and supported by the literature review to encounter suitability between literature and the field. The research recommends strategies to conserve the heritage of traditional building through reinventory and document the Bali Ada villages as a source of information of the Bali Aga existences for academic purposes, for public, wide community and the Bali Governance.

# 2.0 UNDERSTANDING OF BALI AGA AND BALI APANAGA

The Bali Aga is referred to the community that still adopts the original culture and tradition of Bali. Historically this community fled to the highland areas as Reuter (2002) give name as 'the Mountain Balinese' and

Covarrubias (1974) define Bali Aga as 'Bali Highland'. They stay mostly in the foot of the mountains, hilly areas, some stay along the lake, and in the mainland areas of Bali Island. This Bali Aga as a result without cultural influences from the Majapahit Kingdom, while in reverse, called Bali Apanaga (Dwijendra, 2009). Yudantini (2015) concluded there are two types of cultures of Bali which during the Majapahit era as a key point of the beginning of Bali Apanaga and before the Majapahit era for the Bali Aga greatness. These two types of culture still extant adopted by the Balinese as heritage conservation, especially for the Indigenous Balinese traditional architecture.

Most Bali Aga villages are facing the linear pattern with three zones lay from the upstream to downstream (mountain to the sea or the kaja-kelod/North to the South). The upstream has primary value and it functions as a village temple; in the middle has the madya/middle value which located the settlement and its facilities. Meanwhile the impure zone for the cemetery and other public functions. The traditional Bali Aga houses contain twelve pillars that called the *tampul roras* or the sakaroras. The housing unit is facing a linear pattern and contained four to ten houses in one unit house in a row with no fence. The pattern creates open space in the center as a plaza and as an orientation of the buildings and circulation. The *adat* (tradition) system in the Bali Aga villages called the *ulu apad* (elders) system. Most of Bali Aga people work in agriculture and fishermen. The Bali Aga commemorate cremation by buried the corpses, it is called the biye tanem. The villages are also applying mass cremation. Only Trunyan Village applies "primitive - sky burial" where the people lay the corpses down on the earth's surface (Reuter, 2002). Bali Aga villages do not apply the caste system or called the nyineb wangsa. The wedding ceremony has a unique tradition. Bali Aga villages adopt the second marriage called the *bakti jauman* or the *pekandelan* ceremony. This the second marriage of the couple is continuing of the first marriage called the *biokaonan* that held in the groom's house, the second marriage is held in the village temple of Pura Bale Agung. This marriage as the naur kelaci or the bakti kelaci means to inform and complete their status of marriages in the village by offering pigs or cows. The ceremony of the second marriage usually carried out together or mass marriage. The Bali Aga commemorate village's festival annually called the ngusaba desa. Every village has a different tradition of the ngusaba desa. Tenganan Village celebrates the ngusaba desa through the pandanus war. In the Kintamani most of the villages celebrate the ngusaba desa called the ngusaba tegen through offering the agriculture's harvest.

In reverse, Bali Apanaga more influences by the Majapahit Kingdom era. The settlement pattern uses the Tri Mandala concept that including primary zone as the holy function (temple), the middle zone for housing, and the impure zone for the graveyard and public facilities. The people work as farmers, fishermen, and the trader. The kin system uses the Catur Wangsa, the four types of community that defined by the obligation i.e. the Brahmana (priest), the Kesatria (leader), the Wesia (trader), and the Jaba (common people). The governance system is collective and headed by the *bendesa adat* or the *kelihan adat*. Most people embrace Hindu and Buddhist. The housing pattern uses the compound pattern and creates a *natah* (plaza) in the center of building composition. The Bali Apanaga applies the *ngaben* ceremony through burning the corpses in the *setra* (graveyard). The wedding ceremony is personally celebrated by the family.

# 3.0 RESULTS AND DISCUSSION

# 3.1 Socio-cultural Re-inventory of Bali Aga Villages in Kintamani

Bangli Regency lies between 115° 13' 48" to 115° 27' 24" East Longitude and 8° 8' 30" to 8° 31' 87" South Latitude. Bangli Regency is located in the middle of Bali Island and Bangli Regency has no coast. Bangli Regency has an area of 52,081 Ha or 9.25% of the total area of Bali Province. Bangli Regency consists of 4 sub-districts including Kintamani, Bangli, Susut, and Tembuku; and it consists of 72 villages. Kintamani Sub-district has an area of 70.44% (366.92 km<sup>2</sup>), Bangli Sub-district with an area of 10.81% (56.3 km<sup>2</sup>), Susut Sub-district 9.47% (49.3 km<sup>2</sup>), and Tembuku Sub-district 9.28% (48.3 km<sup>2</sup>) (BPS Kabupaten Bangli, 2018). Kintamani Sub-district land use in 2017 consists of rice fields (110 hectares), plantations (6,201.6 hectares), dry farm (15,113.1 hectares), community forests (1,602 hectares), State forests (9,341.3 hectares), and non-agriculture land including roads, settlements, offices, rivers, and others (4,324 hectares) (BPS Kabupaten Bangli, 2018). Bangli, 2018). Based on geographical position, Kintamani Sub-district bordered by Buleleng Regency to the

north; Karangasem Regency to the east; Buleleng Regency and Badung Regency to the west; and Bangli Subdistrict and Gianyar Regency to the south. The population in Kintamani Sub-district in 2016 was 41.91% or 93.80 thousand people with a population density of 255.66 people per km<sup>2</sup>.

There 25 Bali Aga villages are located in Bangli District (Yudantini, 2015). Although the Kintamani Subdistrict consists of 48 villages spread from the west to the east (BPS Kabupaten Bangli, 2018), only 19 villages are classified as ancient villages (Bali Aga). Table 1 shows that Sukawana Village, Trunyan Village, and Songan A Village have the most extensive areas, there are 33.61 km<sup>2</sup>, 19.63 km<sup>2</sup>, and 17.01 km<sup>2</sup>, respectively. Figure 1 illustrates the mapping of Bali Aga villages in Bangli Regency.



Figure 1: Bali Aga Villages distribution in Bangli Regency. (Source: Yudantini, 2015, p. 132)

N 0	Villages	Sub-district	Area (km <sup>2</sup> )	No.	Villages	Sub- district	Area (km²)
1.	Bayung Gede	Kintamani	10.24	11.	Sukawana	Kintamani	33.61
2.	Kedisan	Kintamani	11.75	12.	Catur	Kintamani	7.56
3.	Songan A	Kintamani	17.01	13.	Belantih	Kintamani	9.05
4.	Songan B	Kintamani	11.88	14.	Blandingan	Kintamani	6.00
5.	Trunyan	Kintamani	19.63	15.	Pinggan	Kintamani	16.53
6.	Buahan	Kintamani	14.23	16.	Batur Utara	Kintamani	3.36
7.	Sekardadi	Kintamani	8.40	17.	Batur Selatan	Kintamani	13.86
8.	Abangbatudinding	Kintamani	14.33	18.	Batur Tengah	Kintamani	4.74
9.	Suter	Kintamani	12.56	19.	Kintamani	Kintamani	15.13
10	Satra	Kintamani	11.63				

Table 1: Bali Aga villages in Kintamani Sub-district

#### (Source: Yudantini, 2015)

Most of the Bali Aga villages in Kintamani are Hindus and have at least three types of temples, there are Kahyangan Tiga temples (three villages temples including Bale Agung Temple, Puseh Temple, and Dalem

Temple), one the *subak* (irrigation) temple and one other temple such as Dadia or Kawitan Temple (a clan temple). In most villages, Bale Agung Temple (Pura Desa) is located in the center or core and as an orientation of village patterns that tends to be linear. This can be seen in the pattern of villages in the villages of Bayung Gede and Buahan Village. Most of the Puseh Temple is adjacent to Bale Agung Temple. As a traditional village with an *ulu apad* system, all religious activities in the village's temples are led by the Kubayan (elders).

In the government system, Bali Aga villages in Kintamani still implement a customary government system called the *Apad* or the *Ulu Apad*, which is known as the *struktur tegak* or the *struktur keduluan* (elders system). The *ulu apad* has variation members. Mostly it has a total of 40 members consisting of 20 people on the right side and 20 people on the left side when they carry out traditional ceremonies. There are also 18 members of the *Ulu Apad* called the *saing nembelas*, such as those in Suter and Abangbatudinding villages. This the *saing nembelas* (*kiwa-tengen* or right-left is equal in number) consists of Jero Kubayan (2 people), Jero Singgukan (2 people), Jero Catu (2 people), Jero Balung (4 people), Jero Cacar (4 people), and the Jero Juk (4 people) so that the total number of members is eighteen (18) people. Meanwhile, for the administrative governance system, it is called the *pengalang*, which accommodates the community numbers. This the *pengalang* system consists of Jero Mekel as the village leader, followed by Jero Bendesa, Jero Penyarikan, and Jero Pemangku. All are working together to support village programs both funded program from the governance and the programs from village self-sufficiency funds. In Belantih Village, it applies the pure ulu apad system which means that members are chosen by natural processes, while the impure *ulu apad* system is inherited from their children and grandchildren or descendants.

The death ceremony is carried out through burial or the *biye tanem* as a characteristic of the Bali Aga tradition. The *biye tanem* means the body is buried for cremation, but only a symbol of death is burned for cremation (the *ngaben*). Some villages implement mass cremation within a certain period which is usually 4-5 years. While the cemetery is distinguished for public and infants (rare). For instance in Belantih Village, it has 3 cemeteries (three *setra*), namely Setra Bunut, Setra Selulung, and Setra Wayah. The grave was distinguished for infants in the upper stream of the cemetery, for nobles in the North East side as a primary area, and the grave for common people is located downstream of the cemetery. However, cemeteries in Suter Village, infants are placed downstream (the *teben*) of the cemetery. In Suter Village and Abangbatudinding Village, the implementation of mass cremation was carried out at the level of the *dadia* (clan), that subsidies from the village office. While Trunyan Village is known for its 'primitive' sky-burial (Reuter, 2002), where the corpses are placed on the ground and protected by triangles bamboo (the *ancak saji*) to avoid animal disturbance. This system is the only one in Trunyan Village and Bali. The cemetery of Trunyan Village is protected by a Taru Menyan tree that serves as a neutralizing air from the odor of the corpses. Most of the people of Bali Aga villages in Kintamani are hiding their castes (the *nyineb wangsa*), but in Belantih Village, there was one clan who used their caste, namely Arya Kuta Waringin in Kayu Padi Hamlet.

The annual festival or ceremony is unique in the Bali Aga villages is called the *ngusaba desa*. Each village has its uniqueness of the *ngusaba* ceremony held in Bale Agung Temple. The *ngusaba* is a ceremony to offer thanks to the ancestors for prosperity and fertility. Suter and Abangbatudinding villages commemorate the *ngusaba tegen* that offered the agricultural harvest. There are three offerings (the *tegenan*) that are often given by the community. The first *tegenan* offered the ancestors that been cremated (the *ngaben*); the second *tegenan* offered to start from the lowest to the highest ancestors. The *tegenan* for the infants held in front of the entrance of housing, the second *tegenan* is held in Puseh Temple, and the first *tegenan* is carried out at Bale Agung Temple.

The wedding is also a unique ceremony in the Bali Aga villages. The villages of Suter and Abangbatudinding implement mass wedding ceremonies, in this case as a continuation of the first marriage ceremony. The first wedding ceremony is held in each house with a small and simple ceremony (the *biokaonan*). The second marriage ceremony is a continuation marriage called the *bakti jauman* that held in Bale Agung Temple (Village Temple). This mass wedding ceremony subsidies by the village office. There are 8 to 10 couples joint the mass

wedding that also called the *pekandelan* ceremony that is offering a *bakti kelaci (klaci*) in the form of a small pig. If each married couple is from the same village or is called the *krama uwedan* (original), thus they have to offer 2 pigs as the *klaci*. If the other bride or groom comes from another village then only offer 1 pig. In ancient times, these pork offerings would be slaughtered, and the meat distributed to the public as a notification that someone was carrying out a marriage. However, nowadays the tradition of meat distribution has not been carried out since 2002. These pork offerings are handed over to the village to be cashed and become the treasury for the village so that they can be used for other activities.

# 3.2 Architectural Re-inventory of Bali Aga Villages in Kintamani

The settlement pattern of Bali Aga villages uses a linear pattern that influenced by topography. The linear pattern is found in most villages such as Sukawana, Pinggan, Belantih, Suter, Abangbatudinding, Trunyan, Bayung Gede, Kedisan, Sekardadi, Kintamani and Buahan. In one housing unit consists of several houses with a linear pattern. There are 4 to 10 houses in one unit and most of the population is not in one kin. Houses are open and there are no borders or fences in the one-unit house. These traditional values can be learned that people have a good relationship to trust each other. This is also for security in the village which involves everyone in control and monitoring the village environment. The traditional houses are called the *tampul roras* or the *saka roras*. A traditional house consists of 4 functions, including kitchen, bedroom, shrines (the *pelangkiran*) and terrace or the *ampik* or the *terampe*. The house has a simple function as a residence where people carry out their activities in one place in their house except for livelihood. The kitchen room as a place to cook daily food, the bedroom as a place for rest at night, a sacred place as worship place to the ancestors and the *ampik* or the *terampe* to receive guests, socialize, prepare offerings (the *banten*) and functioned as a place for clean water tanks that comes from rain.

The traditional house (the *sakaroras*) in Buahan Village consists of the *lobang dangin* as a holy place, the *lobang dauh* functions as a parent's bed, and the *lobang delod* is a sleeping room for children. The *patokan* is located between the *lobang dangin* and the *lobang dauh*. There is the *ketungan* located in front of the *patokan* that has a function as a ladder. The kitchen is called the *paon* or the *punapi* due to there is a traditional fireplace in the kitchen. Above the *punapi* (fireplace), there is a place to put firewood and put or hang the pork. The *peluangan* is located in the middle of the room which is the orientation of all existing rooms. The *peluangan* is touching the ground. The traditional structure and construction for the *sakaroras*, especially the rooms or the *bale-bale* have *sunduk* (wood beam construction) that creates space between the *bale-bale* and the ground. Finally, in the front of the *sakaroras* there is an open space called the *amben* as the terrace. In this the *amben* there also is located a small *lincak* or terrace that function as a place to put agricultural goods.



Figure 2: Linear pattern in Belantih, 1980s (Muller, 2011); and current pattern in Belantih Villages.

The houses in the village of Suter are called board houses or the *sakaroras* (Figure 4). The existence of the *sakaroras* is already difficult to find. Most people build a new housing style in the farm. The results of the

interview, that there are only about five households who still have the *sakaroras*, while most of the houses are already changing into modern style. The *sakaroras* house consists of a bed and a kitchen (the *punapi*), but in some board houses (the *sakaroras*) there is no kitchen in the *sakaroras* because the kitchen is moved to another place.



Figure 4: The Sakaroras in Suter Village and its elevation.

The changes in building appearance occurred in several villages that cannot be avoided. This has happened in several villages in Kintamani such as Belantih Village, Suter Village, Abangbatudinding, and many other villages. There are several buildings have been changed in the architectural including the housing pattern, the dimensions become larger (Figure 2 and 3), thus this affects the change of the building appearances. This change causes the need for space to live in. The changes in the use of new materials have also happened. The shingle bamboo of the roof has been changed into zinc or tile. The new house uses concrete for structure rather than wood and ceramic for the floor and wall covers to replace to soil (*tanah polpolan*).



Figure 5: The house's change and the uses of new material in Suter Village and Belantih Village.

# 4.0 CONCLUSION

The conservation of Bali Aga Villages in Kintamani for both socio-cultural and the architecture is inseparable from the awareness of its owner in maintaining the values of authenticity that have been inherited from generation to generation. Holistically, Bali has two different cultures, but both are based on Hinduism. These two cultures are the result of the influence of Majapahit culture in 1343 AD where there two types of culture retain the original culture of Bali and the culture that adopted the Majapahit influences. This research recorded the existence of Bali Aga villages in Kintamani in terms of history, norms, and customs. Most cultures still retain their original culture, but some villages have begun to adjust to the current needs that are relevant to the lives of their communities. There are things that they believe in and don't dare to deny to not carry out these habits and traditions. For example, the second marriages in some villages are still being carried out where the community strongly believes that if they don't do it, they will face undesirable things in their lives.

In the term of architecture, founds that most villages have changed their traditional housing to modern types and use new or modern materials. This is also unavoidable because the community's economy is improving and of course they want to have a place to live with a better appearance. But it is very worried about this condition, if all people change their traditional houses, of course, the extinction will occur. For this reason, the research is very urgent to carry out further research and recommends for the government to provide an understanding of the importance of local values because it is a reflection of identity. This is undeniable considering that Bali is a tourism destination that is known for its unique cultural and traditional architecture. For this reason, it is very urgent to conduct socialization and provide an understanding of traditional values. This study also recommends further research on the use of renewable materials that still have characteristics similar to local materials, given the increasing scarcity of local material sources.

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