ISLAND BASED DISASTER RESILIENCE ; THE METRICS

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ABSTRACT

HABITAT III is designed to set "a New Urban Agenda' for the 21st Century". However, how that agenda is 'metricated' will be paramount for it to have the reach and impact that it seeks. The common approach is to set a series of goals or targets to which Nations feel comfortable but it is often left as 'interpretive' as to whether projects and programs succeeded in reality. The assumption is that there is no metrication that can cross between different programs, different cultures, different locations and different politically contexts. It is problematic. This paper looks at recent work from Fiji following cyclone Winston that underlines this problematic nature while also suggesting a way to address it. That suggestion is to use a Quality of Life metric and that Agendas like the New Urban need to carefully and deliberately incorporate such a metric so that the outcomes across the framework can be ascertained and readily compared for progress to be achieved.

Keywords: Resilience, Post-disaster, Quality-of-Life

INTRODUCTION

HABITAT III is designed to set "a New Urban Agenda' (NUA) for the 21st Century" (Habitat III 2012). It will be the follow-on from HABITAT II 20 years earlier and while it seeks to set an agenda or roadmap for planners and policy makers for urban areas the key aspect of 'how' is seemingly not considered nor investigated. For example the word 'indicator/s' is used only 4 times in the Zero Draft of the NUA released in May 2016. Measurement was not mentioned at all, policy was mentioned 20 times and plan/s/ning 85 times. Hence, it is currently aimed at planning but will need to be grounded in outcomes for its implementation. UNHABITAT acknowledges (Habitat III 2012) that "this will necessitate the building of local resilience and to take action to remedy critical information gaps which inhibit strategic urban development".

There has been the suggestion that the NUA be connected to the 17 Sustainable Development Goals (SDG) especially given the strong links to Goal 11 on Sustainable Cities and Communities (CAD 2015); and this would automatically connect it to the targets and indicators of the SDG approach. Others such as

American Planning Association (APA) have suggested a framework based on the idea of the "City We Need."(TCWN 2.0 2016) The Sendai Framework for Disaster Risk Reduction DRR is another possible framework. Nonetheless, the NUA will need to reflect some form of the SDG and the DRR of the Sendai Framework. The question posed by this paper is how will the NUA will be operationalised and how will it be metricated; how will those implementing such programs know they are doing the 'right' thing or going in the 'desired' direction? And it examines that using recent work following cyclone Winston in Fiji.

The implementation of the NUA in the Pacific has several issues (EPUF 2015); and one key aspect was how would informal settlements be addressed? In addition the Pacific Island context or Small Island Development States (SIDS) are characterised by the following:

1. They are firstly remote and smaller in scale.
2. They are often clustered but scattered within a geographical area with constraints on the transport and communications between them;
3. Their ecosystems and economies are fragile and vulnerable to natural disaster and their markets are usually limited to tourism.
4. They are dependent on imports and a significant part of their economy is from remittances from family living and working off shore.
5. There is often limited freshwater, natural resources and infrastructure.
6. And perhaps because of this they find that they are at the 'pointy' end of Climate Change with sea level changes for example impacting on fresh water, tourism, infrastructure and their economy's.

So what does disaster resilience mean or even look like in such a context? Chase and Fevrier (Chase Fevrier 2014) suggest that "…..a new paradigm therefore has to emerge. Social cohesion, that is, the formal and informal connections between groups, is critical to the incremental and transformational change necessary for building resilience against the negative impacts of climate change. The new paradigm should therefore focus on creating social capital at the community level, developing capacities at the community and individual household levels, and building social resilience and cohesion by creating redundancies through community networks, social safety nets, and civil society organizations; these provide more than one system of coping so that when one system is impacted the others help with continued functioning. The greater the redundancy, the more resilient the system." Hence, there is the need to deeply engage with communities and understand the creation and transactions of social capital. This seems to be beyond the indicators and frameworks discussed earlier.

But here is the rub; much of the research is geared to producing these frameworks as a way to understanding the relationships between key factors. For example, the framework in Figure 1 shows the pathway to a Village based Resilient Response and is one that I currently use for both research and teaching. It's a very useful framework.
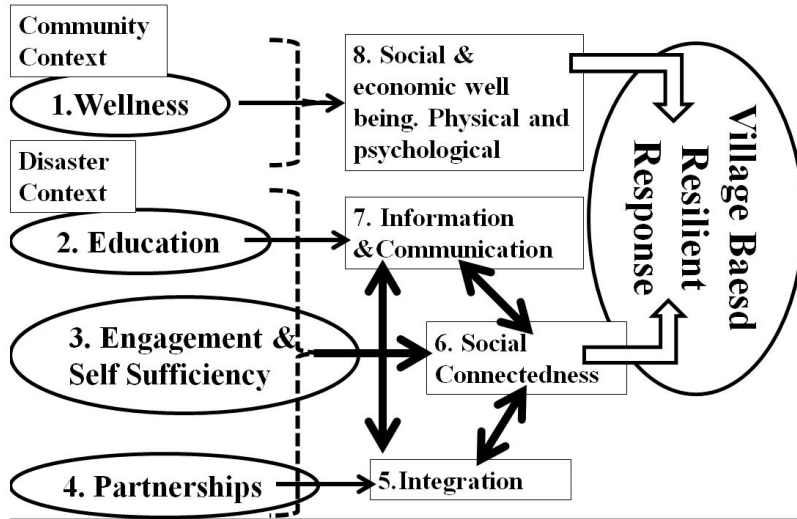
Figure 1. One Resilience Framework
Source: adapted from Chandra et al 2011

It suggests that there are two contexts, the Community one (wellness) and Disaster (education, engagement and self-sufficiency, and partnerships). These create the outcomes numbered 5 to 8 and together with the cross cutting aspects of monitoring and resource prioritisation create a platform for a resilient response. However, the centrality of social capital as earlier hinted at by Chase and Fevrier is not seemingly there: and while there is Social Connectedness the role of social media could be argued as splitting social capital and social connectedness (SCCCHP, 2011). But we will come back to this model.

Tropical Cyclone Winston

Tropical Cyclone Winston hit Fiji on the 20 and 21 February, 2016. The category 5 cyclone resulted in 44 deaths and the evacuation of over 62,000 people into nearly 900 evacuation centres (SHAP 2016). It damaged or destroyed an estimated 28,000 houses as it passed through the Fiji Islands (see Figure 2). And the discussions amongst the affected towns and villages once they had stabilised was how to get back to where they were, how could they find and activate such a resilient response? Frameworks like that in Figure 1 became important and a study was proposed to see how well villages were responding, 4 months after Winston.
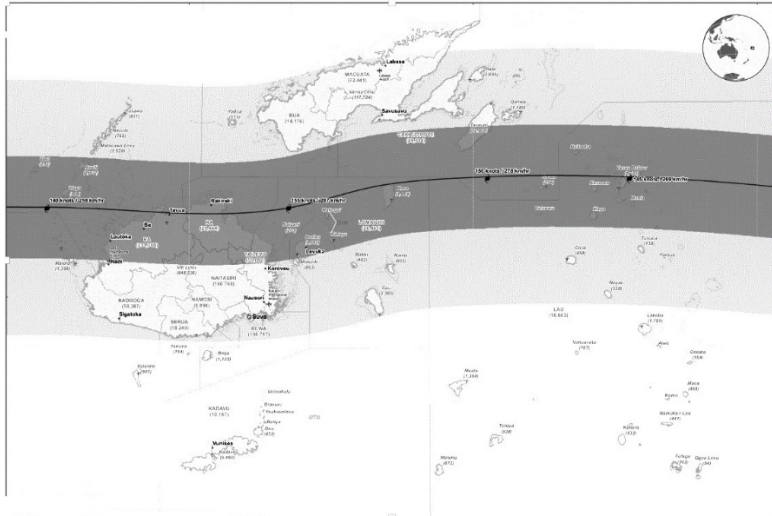
Figure 2. The Path of Cyclone Winston Across Fiji (right to left)
Source: www.sheltercluster.org

THEORY/RESEARCH METHODS

Village Selection

The FRCS sub office in Rakiraki which was the Fijian town at ground zero of the affected area on the main island of Viti Levu had been working in several villages and it suggested that Nokonoko could be used for such a study. The village had been heavily damaged during the cyclone with over 60% of houses losing their roofs. Power had been cut off and was still off in June 2016 when the village was surveyed. The new roofs (seen as lightly shaded) in Figure 3 below show the extent of damage caused by Winston.

Figure 3. Nokonoko Village Damage
Source: Field survey

Field observations noted the following (relevant to the Resilient Framework of figure 1):

1. Wellness: Health and social programs were being run by the Fijian Red Cross Society FRCS together with a strong and obvious community network based on family and kinsman ship.

2. Education: Ongoing information on programs such as Governments Help for Homes and other organisations were widely known within the village. In addition there were 8 Red Cross Volunteers that lived in the village and so it was well connected in terms of information. In addition it was on the main road between Suva and Rakiraki and was readily accessible.

3. Engagement and self-sufficiency: There was a strong participatory decision making through the village Council of Leaders and many had already started working on the repair of their houses.

4. Partnership: There were strong connections with the FRCS especially with the village chief also being the chairperson of the FRCS Rakiraki sub office; and the village school had re-opened.

Thus, there was noticeable wellness and there appeared to be strong social connectedness; and the expectation was that the village had responded well. This perhaps can be sensed in the photographs of the village in figure 4 below that show the survey team having a meal with the villagers, the surveying their houses or inspecting the rebuilding that was occurring spontaneously. It was certainly evident to the survey team. However, this conclusion was to be heavily questioned by the subsequent survey.

Figure 4. Nokonoko Village Resilience
Source: Field survey

Methodology: The Use of Quality of Life as a Metric.

According to Sharpe there are at least 38 QoL models (Sharpe 2005) that seem to fall into the 3 following categories (adapted from Galloway 2005):

1. Type 1: The most common, usually says little about the possible components of QoL because they are usually based on semi objective data such as GDP, health statistics, cost of living or employment data. For example Life satisfaction and religion by Mookerjee and Beron and the Quality of Life Report, New Zealand.
2. Type 2: Break down QoL into a series of components, dimensions or domains, or identify characteristics deemed essential to any evaluation of QoL. Alternatively, they identify a number of dimensions of general QoL, but may not necessarily claim to cover every possible dimension. For example WHO QoL Tool, Universal quality of life model, the DASS42, the Life Assessment Questionnaire (LAQ) and the Quality of Well-being (QWB) Scale.
3. Type 3: Explicitly tailored to meet the objectives of a specific piece of research or sector. May therefore overlook or exclude certain dimensions of QoL considered less relevant to the research aims. Alternatively, may refer only to one or a small number of the dimensions of QoL commonly in the health-related QoL They can also be a "hybrid" of types 1 and 2. For example Multi-level Assessment Instrument (MIA) and the PRECEDE-PROCEED

The DASS42 QoL tool was used for this study firstly because it was well known and had been extensively used prior to Fiji (Potangaroa et al 2014); but there were also several other reasons.

Why Select the DASS42?

The Depression Anxiety Stress Survey DASS42 (consisting of 42 questions) and was selected because it has the following advantages over other QoL tools:

1. It does not need a before and after survey to draw relative comparisons. This meant that the QoL could be characterized from one survey. This was a major advantage.
2. It has been designed for use by non psycho-social professionals and so could be readily used by building professionals and it was readily available from the internet.
3. It deals with the "ubiquitous" situation rather than the clinic situation and hence could be readily apply to the village context.
4. The questions are phenomena-logically based and are largely trans-cultural. This makes them easier to ask, generally easier to understand and allows direct answers.
5. And importantly in post disaster reconstruction situations, would not generate expectations amongst the villagers. Any survey work carried out post disaster can carry "unintended expectations". For example, the need to know what percentage of people could build their own houses could be ascertained by simply asking "would you be able to rebuild your own house?" However, the "expectation" is if they are not then someone might help them and so people are encouraged to

answer "no" even if they can. Moreover, changing the question to "how would you rebuild your house?" suggests there could be various assistance packages and instead encourages people to say they are worse off than they might be in the expectation they might get something regardless. However, asking respondents to grade from 0 to 3, with 0 meaning "Did not apply to me at all" to 3 meaning "Applied to me very much, or most of the time" a question like "I found myself getting upset by quite trivial things" does not raise any similar expectations. This is the format of the DASS42.

It was developed at the University of New South Wales, in Sydney Australia (Lovibond 1995). And is a "set of three self-report scales designed to measure the negative emotional states of depression, anxiety and stress" and was "constructed not merely as another set of scales to measure conventionally defined emotional states, but to further the process of defining, understanding, and measuring the ubiquitous and clinically significant emotional states usually described as depression, anxiety and stress" (DASS 2006). The characteristics of high scorers on each DASS scale are as follows:

1. Depression scale: self-disparaging, dispirited, gloomy, blue, convinced that life has no meaning or value, pessimistic about the future, unable to experience enjoyment or satisfaction, unable to become interested or involved, slow, lacking in initiative.
2. Anxiety scale: apprehensive, panicky, trembly, shaky, aware of dryness of the mouth, breathing difficulties, pounding of the heart, sweatiness of the palms, worried about performance and possible loss of control.
3. Stress scale: over-aroused, tense, unable to relax, touchy, easily upset, irritable, easily startled, nervy, jumpy, fidgety, and intolerant of interruption or delay.

A further 13 questions were added to the 42 that make up the core of the DASS42 as follows:

0 Did not apply to me
1 Applied to me to some degree or some of the time
2 Applied to me to a considerable degree, or a good part of the time
3 Applied to me very much or most of the time.

43 Did you feel lonely in the last week   0   1   2   3
44 Do family say that things are getting better   0   1   2   3
45 How often in your 'spare' time did you help a sports club, church or other group without pay   0   1   2   3
46 How would you describe your wider family connection   0   1   2   3
47 I have access to traditional food sources   0   1   2   3
48 I have access to the internet   0   1   2   3
49 What is the highest education in your family _____
50 What is your age in years   _____ years
51 What is your sex, female or male   F   M
52 How many are there living in your house   _____number
53 How many bedrooms are there in your current house   _____number

54 What is your household income (please circle) 0-5k/ $5-17k/ $17-30k/ $30k+

55 What do see as the 3 key issues for your family (please number 1 first to 3 last)

[ ] Housing   [ ] Health   [ ] Employment   [ ] Crime   [ ] Drug and alcohol

[ ] Schooling   [ ] Education   [ ] Other (specify).

The DASS42 and its Severity Table

One significant advantage (mentioned above) was not requiring a before and after survey. This is because of what the DASS42 developers call a Severity Table, shown in tabel 1 below. This table can directly "characterise" the DASS42 scores based on one study (Lovibond 1995). Experience with this QoL tool has further suggested the typical interventions show in the last column on the right with the "extremely severe' usually being at an individual level rather than a community one.

Tabel 1. The DASS42 Severity Index Table (Devilly 2005)

	Depression	Anxiety	Stress	Intervention
Normal	0 – 9	0 – 7	0 – 14	OK
Mild	10 – 13	8 – 9	15 – 18	Minor issues, resolve internally.
Moderate	14 – 20	10 – 14	19 – 25	Major issues, resolve externally
Severe	21 – 27	15 – 19	26 – 33	Major issues, resolve externally.
Extremely Severe	28+	20+	34 +	Professional pyscho-social intervention.

RESULTS AND DISCUSSION

The 88 surveys were entered into an EXCEL spreadsheet using the 3 self-reporting scales of the DASS42 for analysis. That gave the following average figures:

1. Depression 15.0 Moderate
2. Anxiety   14.9 Severe
3. Stress   18.4 Mild

And it was immediately apparent because of the elevated depression and high anxiety scores that there were issues; and that these were being outwardly managed so as not to be apparent. This finding was informally confirmed by the 8 Red Cross staff that lived in the village but sudden we were looking at a very different situation then what we might have thought based on the Resilient Framework. Moreover, if this was one of the better performing villages (as we had noted) then what was the situation for those villages that weren't 'performing well'….what was their situation?

A check on the differences between women and men did not suggest that there were significant differences as show in tabel 2 below. That is surprising as women in a post disaster context are usually 1 level lower in terms of their QoL than

men on the severity table characterisation. In this village there was no such difference.

Tabel 2. Characterisation of DASS42 Data Based on the Severity Tables by Sex

	Women	Men
Depression	15.0 (moderate)	15.0 (moderate)
Anxiety	15.2 (severe)	14.7 (severe)
Stress	18.0 (mild)	18.8 (moderate)

Neither did an age break down of the data. All ages appear about the same with a slightly better QoL shown by those in the 30-39 age bracket (see tabel 3).

Tabel 3. Characterisation of DASS42 Data Based on the Severity Tables by Age

	Depression	Anxiety	Stress
Less than 30 years	16.4 (Moderate)	16.3 (Severe)	18.7 (Moderate)
30-39 years	13.2 (Mild)	12.4 (Moderate)	16.3 (Mild)
40-49 years	14.8 (Moderate)	15.6 (Severe)	17.9 (Mild)
50+ years	15.4 (Moderate)	15.3 (Severe)	19.8 (Moderate)

The additional survey questions from 43-55 did go somewhat further and the following was noted:

1. Despite being related by family and having kinsmanship networks and where family connections and volunteer work was reported as "applied to me to a considerable degree, or a good part of the time" by 66% of the village; the flip side was that 34% of the villagers reported that they were 'lonely' for "considerable degree, or all of the time": with 15% reporting for all of the time! This apparent loneliness or social disconnection was directly linked to a significantly lower QoL at the 'severe' level. This meant that people with a severe characterisation in any one of the 3 self-reporting categories were reporting high social disconnection. Thus, addressing the priorities areas listed in 2 below would greatly increase their QoL while at the same time start to address their other issues.

2. Villagers selected housing (43%) schooling (24%) and education (18%) in that order as their 3 key issues for their families. The difference between schooling and education was that schooling was attendance at the local school while education was schooling outside the village. However if villagers 2nd and 3rd choices were included the priorities changed to housing (31%) and health (30%) being essentially first equal; followed by schooling (20%) and then education (11%). The key in this list appears to be getting schools operating and community based health programs into the villages. While housing is number one on the priority list it would be more problematic to implement, more costly and slower than schooling and health.

3. The average family size was 5.9 and the number of people per bedroom was 3.4 suggesting a level of overcrowding. This could/would be reflected in the health statistics.

4. The average household income reported was 0-5,000 Fijian Dollars/year. To put this into some perspective a basic 6x4 metre shelter was costing in the order of 8,500-10,000 Fijian Dollars. This may have been why shelter was the number one priority.

5. This may also be why 60% of the village relied entirely on traditional food sources and that 74% relied on it for a considerable amount of the time or more. Thus, the village heavily relied on what it could grow or gather.

6. Interestingly, 34% reported that the highest educational qualification in their family was University based, 43% reported technically based or higher and 88% secondary or higher. This seems unusually high for the University qualification but suggests that there could be skills that could be developed from within the village; and also why there are 8 FRCS volunteers from it.

There are ostensible under lying issues that the village may need to address. What they are exactly will come from interviews with families and in particular those families with a lower QoL. The QoL Approach does not pin point those issues but as can be seen in this example high lights where they are occurring despite apparent evidence to the contrary. At the same time, health programs and school refurbishment should be promoted via innovative approaches given that it will not be feasible to address all schools following an extensive category 5 cyclone event.

CONCLUSIONS

The idea that a framework alone is sufficient has to be questioned. The case study used in this paper is one of many others that the author has encountered and underlines that aid and development personnel in the field need to scrutinise what they are observing with an independent approach. That could be a QoL approach similar to what was outlined in this paper.

In the case of Nokonoko it seems that despite an ongoing resilient response the village has issues of well-being that should be addressed and dealt to perhaps within the 3 or 4 identified priorities of housing, health, schooling and education. They are perhaps not hard to identify in any case.

Certainly, there has to be more than photos of 'happy' people to justify what is happening in a village; and this study should serve as a cautionary note for using such approaches but also that the NUA will need a metrication in which it can be based that touches on both the qualitative and quantitative which brings us back to where we started this paper.

ACKNOWLEDGEMENT

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