Technical Guidelines for emergency and early recovery shelter response in Fiji

V1 – September 2016

About Shelter Cluster Fiji

As defined in Shelter Cluster Fiji Terms of References, developed in 2012 during TC Evan response, the government is leading the Shelter cluster through the Ministry of Local Government, Housing & Environment (MoLGH&E) with the International Federation of Red Cross and Red Crescent Societies (IFRC) as the humanitarian co-lead agency.

Following TC Winton response the Shelter Cluster Fiji Lead agreed to differentiate response and preparedness coordination and priorities framework. As per September 2016 NDMO led process to review clusters TORs, Shelter Cluster Fiji will review its TORs with IFRC as humanitarian co-lead for response, and joined humanitarian co-leads for preparedness between (1) IFRC (Emergency shelter and NFIs prepositioning) & (2) habitat for Humanity (Building Back Safer and trainings). The updated TORs[1] include SCF priorities for response and preparedness, but would need NDMO endorsement or the joined co-lead for preparedness.

This document outlines the framework of technical guidelines and recommendations for shelter in both the emergency and early recovery phases of response following a natural disaster in Fiji. This document is built on the various guidelines developed after TC Evan and TC Winston, working with partners in Shelter Cluster Technical Working Groups and other relevant stakeholders. This is a living document that should be updated and complemented following relevant learning from the shelter sector in Fiji. For more information you could contact

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[1] http://sheltercluster.org/sites/default/files/docs/160913_terms_of_reference_fiji_shelter_cluster_v2_draft.pdf

1. INTRODUCTION

Fiji is an archipelago of 332 islands (of which approximately 110 are inhabited), spread over a land area of approximately 18,300km2 and a geographic area of almost 50,000km2. The country's population of approximately 865,00011 resides primarily on the two largest islands, Viti Levu and Vanua Levu. Fiji is the second largest country in the region after Papua New Guinea.

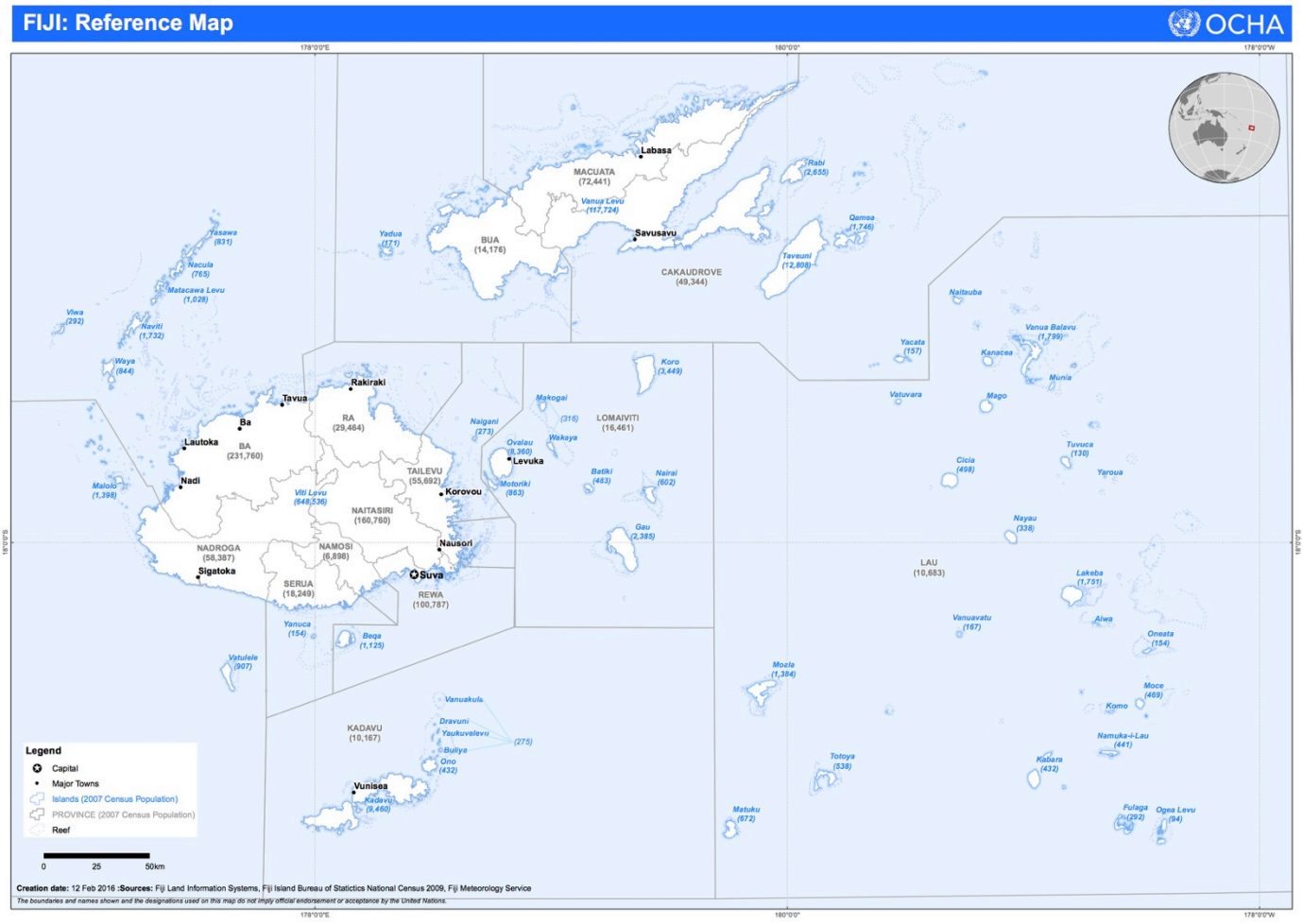
Fiji lies between latitudes 16 – 21 south latitude in the South Pacific, and as such is often in the path of tropical depressions and cyclones. The resulting damage from wind and flooding to the natural and built environment has produced a range of coping mechanisms within the landscape and the population.

Fiji is an archipelago of largely mountainous islands of volcanic origin, with relatively few of its islands being low coral atolls. While it is seen as a refuge from rising seas for the populations of low-lying neighbours (Tuvalu and Kiribati have purchased land in Fiji), Fiji itself is not immune from the impact of climate change. Much of its population live on the coastal fringe, and all major cities and towns are either ports or seaside locations.

Rank	Country	WorldRiskIndex	Exposure	Vulnerability	Susceptibility	Lack of coping capacities	Lack of adaptive capacities
1.	Vanuatu	36.28 %	63.66 %	56.99 %	34.90 %	81.16 %	54.90 %
2.	Tonga	29.33 %	55.27 %	53.08 %	28.66 %	81.80 %	48.76 %
3.	Philippines	26.70 %	52.46 %	50.90 %	31.83 %	80.92 %	39.96 %
4.	Guatemala	19.88 %	36.30 %	54.76 %	35.82 %	81.00 %	47.46 %
5.	Bangladesh	19.17 %	31.70 %	60.48 %	38.23 %	86.36 %	56.84 %
6.	Solomon Islands	19.14 %	29.98 %	63.83 %	44.01 %	85.56 %	61.90 %
7.	Brunei Darussalam	17.00 %	41.10 %	41.36 %	17.40 %	63.17 %	43.53 %
8.	Costa Rica	17.00 %	42.61 %	39.89 %	21.32 %	63.78 %	34.57 %
9.	Cambodia	16.58 %	27.65 %	59.96 %	37.55 %	86.84 %	55.49 %
10.	Papua New Guinea	16.43 %	24.94 %	65.90 %	54.81 %	83.94 %	58.95 %
11.	El Salvador	16.05 %	32.60 %	49.25 %	27.84 %	74.78 %	45.14 %
12.	Timor-Leste	15.69 %	25.73 %	60.98 %	49.93 %	81.39 %	51.61 %
13.	Mauritius	15.53 %	37.35 %	41.58 %	18.02 %	61.59 %	45.14 %
14.	Nicaragua	14.62 %	27.23 %	53.69 %	33.67 %	80.70 %	46.71 %
15.	Guinea-Bissau	13.56 %	19.65 %	68.99 %	52.64 %	89.93 %	64.38 %
16.	Fiji	13.15 %	27.71 %	47.47 %	24.18 %	74.69 %	43.55 %

Fiji, 16th in the World Risk Index 2016 (World Risk Report - Bündnis Entwicklung Hilft & United Nations University – EHS) [2]

[2] http://weltrisikobericht.de/wp-content/uploads/2016/08/WorldRiskReport2016.pdf



Fiji: Reference map (OCHA)[3]

[3] http://www.unocha.org/rop

LOCATION

POPULATION

Total:	909,389
Urban population:	53.7%
Rural population:	46.3%
Urban population growth:	1.45% annual rate
Population density:	48.2 people/km²

ETHNIC GROUPS

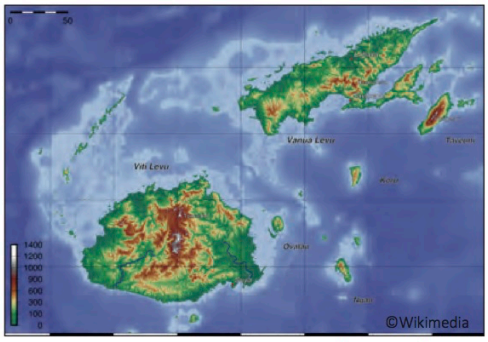
iTaukei (native Fijians):	56.8%
Indian:	37.5%
Rotuman:	1.2%
Others:	4.5%

(data from CIA World Factbook and Preventionweb)

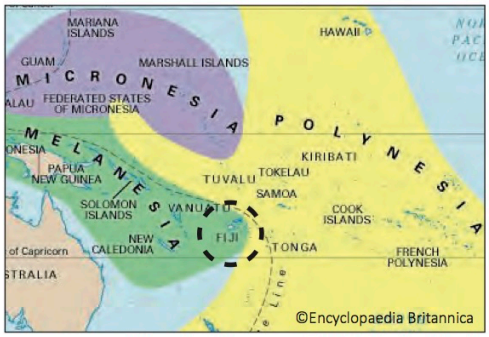
CLIMATE

Tropical marine with slight seasonal temperature variations

Rainy season & South-Pacific cyclone seasons:
November to April



Topography map



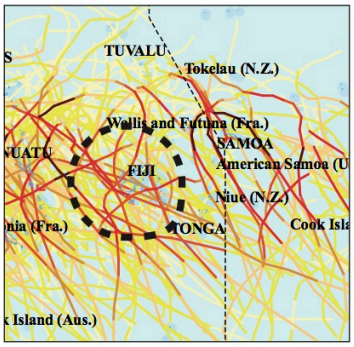
Map of culture areas in the Pacific Islands

NATURAL HAZARDS

- [x] CYCLONES & STRONG WINDS
- [x] EARTHQUAKES
- [x] FLOODS
- [x] TSUNAMI & STORM SURGES
- [ ] LANDSLIDES
- [ ] OTHER:

NOTE:
Cyclones are the most recurrent and devasting hazards

Natural hazard risk map (UN-OCHA)



Storm tracks 1956-2006 (UN-OCHA)

FIJI | BASELINE DATA ON LOCAL BUILDING CULTURE & COPING STRATEGIES | CRAterre 2016 3 / 14

[4] **Fiji: Country profile (Baseline Data on local building culture & coping strategies - CRAterre)**

[4] http://sheltercluster.org/sites/default/files/docs/fiji_baseline_data_on_local_building_practices_coping_strategies_craterre_final.pdf

2. SHELTER CLUSTER RECOMMENDATIONS FOR RESPONSE TO NATURAL DISASTER EMERGENCIES.

2.1 COORDINATION FRAMEWORK

National structures

Recognition of Fiji's vulnerability by the GoF has led to the establishment of a national response framework under the direction of the National Disaster Management Office (NDMO). This is housed within the Ministry of Rural and Maritime Development and National Disaster Management.

Fiji has a strong national structure for disaster preparedness and emergency operations. This is composed of the National Disaster Management Council and the NDMO at capital level and of disaster management committees at the provincial and district level. The country has also developed a National Disaster Plan[5], Disaster Management Act[6] and Standard Operating Procedures for disaster response[7]. The National Cluster System brings together Government ministries and a network of humanitarian actors, with United Nations agencies and international and national NGOs.

The Fiji National Clusters were adopted in late December 2012 during the response to TC Evan, and activated in 2016 for the response to TC Winston. There are eight Clusters as follows: WASH (Water, Sanitation & Hygiene), Shelter, Education, Health & Nutrition, Logistics, Safety & Protection, Food Security & Livelihoods, Public Works & Utilities. The Fiji National Disaster Management Office (NDMO) sits at the "core" of the Cluster system to provide overall coordination and to facilitate central planning and funding issues.

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[5] https://www.humanitarianresponse.info/en/operations/fiji/documen/fiji-national-disaster-management-plan-1995
[6] https://www.humanitarianresponse.info/en/operations/fiji/document/fiji-natural-disaster-management-act-1998
[7] https://www.humanitarianresponse.info/en/operations/fiji/document/fijis-national-emergency-operations-centre-sop-2010

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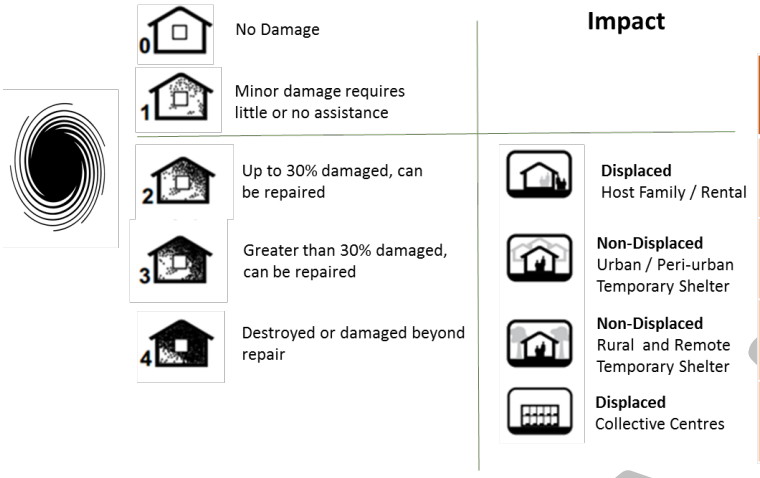
2.2 RECOMMENDED SHELTER RESPONSE OPTIONS

Note: *These response options were identified as technical advice part of the Shelter Cluster Strategy for Fiji for the response to TC Winston[8]. These SHOULD be reviewed to support shelter response strategy to further natural disaster in Fiji.*

a. Emergency Shelter

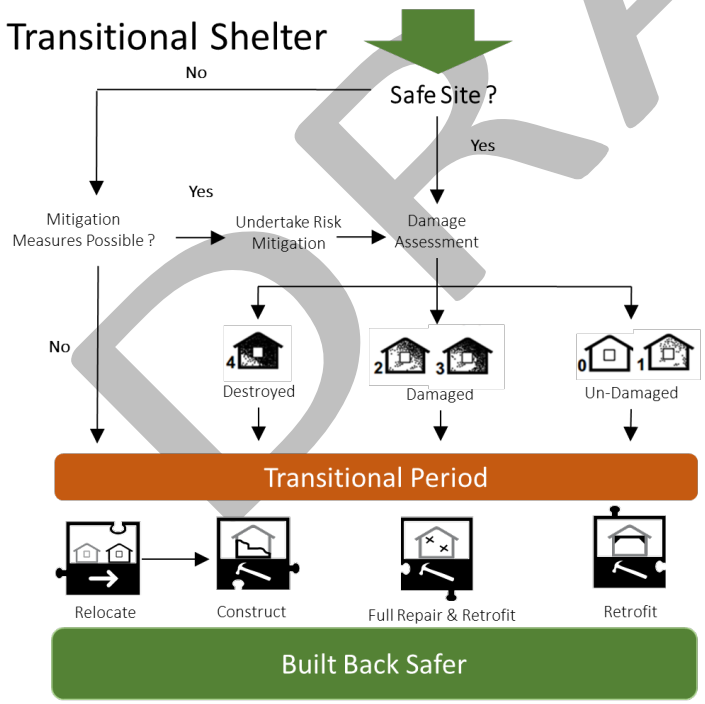
Damage Category 1 - 4



Emergency shelter support options

Protection Support	Tents	Tarpaulins	Tool Kits	NFI	Technical support	Financial
X				X		X
X	X	X	X	X	X	X
X	X	X	X	X	X	X
X				X		X

b. Transitional Shelter



Transitional shelter options are required for households that do not have the resources, or where there are other constraints, that delay recovery. Ideally investment in transitional solutions should promote and contribute toward recovery, such as materials, tools, and technical training and information.

Transitional shelter options

	Protection Support	Materials (In-kind / Cash / Voucher)	Technical Support	Financial
Temp Repairs	X	X	X	
Temp Shelter	X	X	X	
Host Family	X			X
Rent	X			X

To provide SPHERE minimum shelter and protection standards

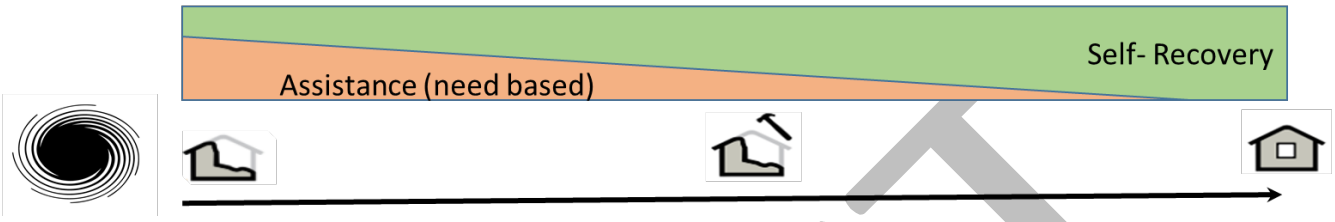
- Access and Protection
- Safe
- Space – Min 3.5m2 / person
- Durable – Sufficient for the period until full recovery is achieved
- Dignified
- Sufficient to meet social / cultural / and livelihood needs

[8]http://sheltercluster.org/sites/default/files/docs/tc_winston_shelter_cluster_hap_160617_v2_with_recovery_guidelines.pdf

c. Shelter Recovery

Considerations for shelter recovery

- To encourage shelter recovery at the earliest, and where possible provide assistance that contributes to this process
- Context and capacity will determine the process of self-recovery
- Assistance is only require up to the point that self recovery has gained momentum and is sustainable.
- Assistance for recovery should be differentiated based on need and be equitable
- Disaster Risk Reduction should be integral to any programs



d. Differentiated Recovery Options

Un-Damaged

Capacity	Safer Building Information	Technical Advice	Support for materials	Support for labour
Low	X	X	X	X
Medium	X	X		
High	X	X		

Damaged

Capacity	Safer Building Information	Technical Advice	Support for materials	Support for labour
Low	X	X	X	X
Medium	X	X	X	
High	X	X		

Destroyed / New Build

Capacity	Safer Building Information	Technical Advice	Support for materials	Support for labour	Advice on Site Selection	House Design	Supervision of work
Low	X	X	X	X	X	X	X
Medium	X	X	X		X	X	X
High	X	X			X		

Note: Regardless of damage category or capacity, the whole community should be provided Safer Building Information and Technical Advice.

e. Assistance modalities, advantages and disadvantages

Assistance Modalities

	Materials (In Kind)	**Cash**	**Voucher**	**Catalogue**
Advantage	• Control of quality • Control of price • Ensures that funds are only used for materials • Assists where people have limited access to markets or where there are logistics issues (islands)	• Provides choice • Open access to the market • Supports local economies • Fast to implement	• Provides choice • Control of quality • Control of cost • Targets support for shelter • Can have agreements with several suppliers	• Provides a degree of choice especially in remote areas • Control of quality • Control of cost • Targets support for shelter • Provides logistics efficiency for remote locations • Orders can be on-line
Disadvantage	• Agency is responsible for logistics • Difficult to provide choice • Can be a long lead time in tendering and arranging logistics • May not support the local markets if materials are directly imported	• No control on the quality of materials • Requires access to markets, which can be difficult for remote communities and vulnerable families • Beneficiary responsible for organising logistics • Can be pressures and temptation for the cash to be used for other purposes (debt, social obligations, etc) • Issues of protection for vulnerable households and groups	• Limited to selected vendors • Is open to abuse where vendors exchange vouchers for cash and take commission • Requires access to markets, which can be difficult for remote communities and vulnerable families • Beneficiary responsible for organising logistics	• Limited suppliers • Requires a tender process to select supplier • Requires assessment to select materials to put in the catalogue • Time and cost of producing the catalogue • Requires administration to process orders and monitor deliveries

2.3 POLICY AND GUIDING PRINCIPLES

Note: *The cluster has agreed to consider the following policy and guiding principles when designing relief and recovery shelter programmes, as part of the Shelter Cluster Strategy for Fiji for the response to TC Winston[9]. These SHOULD be reviewed to ensure that humanitarian policy (in development process under NDMO leadership) is properly reflected here.*

The provision of temporary housing is to be guided by relevant international standards particularly the UN Guiding Principles on Internal Displacement. These principles are integrated into these suggestions and are summarised below. It is the responsibility of the aid community to support Government in meeting its obligations to the affected population.	
	Policy and guiding principles
Guiding Principles	Apply relevant international standards particularly the UN Guiding Principles on Internal Displacement.
	The cluster defined emergency shelter response as tents, tarps, shelter repair kits and tool kits. Transitional shelters will be used were appropriate.
	Use locally available human and material resources in order to achieve maximum participation and empowerment of the local economy without compromising the principles of environmental sustainability.
	Shelter programmes seek to ensure equity across all vulnerable groups. Such assistance should be based on an independent assessment of the level of damage, vulnerability, community resilience, hazard risk, and number of households affected.
	Standardize the relief items. Avoid situation where different agencies provide different packages.
	Disaster risk reduction and mitigation measures are to be integrated into emergency response and recovery
	Support community and owner driven reconstruction to build back safer.
	The emergency shelter response should move quickly into longer-term DURABLE solutions.
	Ensure distributions are well coordinated and dignified to ensure equal access of men and women to shelter materials and NFIs.
	Prioritise good coordination of Cluster members with Cluster Lead MoLGUDH&E. Engage with, and build capacities of local authorities and Government coordination bodies.
	Ensure proper linkages with relevant Clusters as appropriate, especially Health, Water-Sanitation, Protection.
	Ensure mainstreaming of cross-cutting issues.
	Explore and encourage the use of alternative technology for providing construction materials. Such alternative technology should be environmentally friendly and easy to use.
	Encourage and enable the participation of affected communities in assessments, planning, implementation, monitoring and evaluation of shelter programmes.

[9] http://sheltercluster.org/sites/default/files/docs/tc_winston_shelter_cluster_hap_160617_v2_with_recovery_guidelines.pdf

	Ensure that site planning reduces the risk of exploitation and abuse of women, girls, boys and men through choice of location, lighting and provision of public spaces for the social, cultural and informational needs of women, girls, boys and men.
	Consider the different design needs of women and men, and persons with specific needs as well as ensure that shelter design is appropriate for the climate, social and cultural context.
Policy	Ensure relocations due to hazard mapping are fair and equitable. The community to be relocated and the planned host community should be consulted and fully involved in the decision-making process.
	In the first phase there is an emphasis on tarpaulins for roofing, but it's also recognized that quick support is needed to assist those trying to build makeshift emergency shelter or repair damaged houses – shelter materials, repair kits, tool kits, etc..
	When markets allow vouchers are considered an acceptable methodology. But they must be supported with appropriate levels of training, technical support/guidance and monitoring.
	Maximise use of salvaged building materials.
	On-site / owner-driven construction is the preferred methodology. This methodology should be supported by the appropriate level of technical training, guidance / supervision and monitoring – including the distribution and explanation of 'build back safer' educational materials and transitional shelter design information.
	Opportunities should be sought to encourage integration with livelihoods, e.g. building material markets, skilled artisans and unskilled labour, transportation of materials, etc.
	Tents are the least appropriate form of emergency shelter, the sheltering option of last resort. The use of tents has been seen to delay recovery.
	Cash-for-Work or Food-for-Work are acceptable methodologies; these should be used in combination of a wider package of support. Use common standards as advised by the Government, men and women should receive equal pay.
	Prioritize allocation of resources according to agreed vulnerability criteria, and according to capacities and presence of Cluster members.
	Prepare timely transfer of responsibilities to local institutions, including Information Management unit if applicable.
	Emergency responses focus on the effective and timely provision of emergency *and* transitional Shelter. The shelter response reflects the linkages between shelter risk reduction, preparedness, relief, recovery, and development, resulting in a seamless transition from emergency to recovery and reconstruction.
	Where income-earning shelter programming is either not possible, shelter programmes could identify alternate means of participation, such as skills-training in basic construction, for groups in the community that have not traditionally been in charge of building. Participation in shelter construction can offer women and girls greater financial independence.
Strategy	Support market-led/owner-driven recovery initiatives through self-help support at community level
	Work with Gov't and local authorities to inform households consistently and coherently through mass media on policy directives as they emerge, including, for example: – New policies

	– Technical advice (e.g. practical and affordable storm resistant construction techniques) – Mechanisms for (land tenure) dispute arbitration
	Advocacy for relocations to be community driven and supported by appropriate level of development
	Establish need for emergency and temporary shelter solutions based on level of damage, vulnerability, community resilience, hazard risk, and number of households affected
	Assistance should be prioritized equitably according to vulnerability (e.g. child and female-headed households, the elderly, and physically disadvantaged)
	Support those living with host families, self-settling in urban and rural areas, and, should it prove necessary, developing appropriate infrastructure for unplanned or planned camps.
Aim	To complement Government and civil society efforts in providing all disaster-affected persons with safe, appropriate, and habitable shelter – at least one safe room per household – in dignity, to defined international standards.
Objective	The overall objective of the shelter cluster is to work in partnership with local government and communities to provide shelter support to the affected population through the following actions: • Provision of emergency shelter kits • Provision of partial shelter repair kits • Provision of full shelter repair kits • Provision of and/or advocacy for temporary shelter solutions • Provision of and/or advocacy for permanent shelter solutions • Disaster Risk Reduction education and construction training initiatives • Facilitate the coordination of prepositioned shelter-related non-food items • Promote durable solutions • Encourage preparedness • Assist in the development of evacuation centre assessment and management guides In case where permanent solutions cannot immediately begin, adequate interim recovery shelter solutions should be provided. All interventions aim to prioritize the most vulnerable while at the same time providing disaster risk reduction education and training to the wider community. Time-bound and prioritised indicators of success will be pre-agreed within and between Clusters against which progress will be measured.
Standards	Provision of emergency and transitional shelter assistance will strive to comply with minimum standards as outlined in the following documents: Technical Guidelines and Standards established by the shelter cluster in Fiji: (http://www.sheltertcluster.org/Fiji) The Sphere Project; Humanitarian Charter and Minimum Standards in Disaster Response, 2011; Chapter 4 (www.sphereproject.org) Transitional Settlement of Displaced Populations; Chapter 7 (www.shelterproject.org) Guide to the use and logistics of family tents in humanitarian relief: (http://www.plastic-sheeting.org/ref/tents.pdf)
IM	Maintain an integrated monitoring capacity using common methodologies, definitions, and indicators

	Carry out trend analysis of planned vs. actual and report/inform where targets are not achieved
	Geo-statistical mapping of variables as available
	Reporting within the Cluster – all members must report information to the cluster lead
Phasing	Work with the Government on hand-over planning for reconstruction from the outset using early recovery frameworks as appropriate
	The cluster has agreed to consider the following policy and guiding principles when designing relief and recovery shelter programmes, as part of the Shelter Cluster Strategy for Fiji for the response to TC Winston[1].
Comms	**Climate Suitability**
	Social/ economical Suitability
	Cultural suitability
	Resource effectiveness
	Appropriate Location
	Site Risk Mitigation

2.4 SHELTER CLUSTER KEY PRINCIPLES AND PARAMETERS

Key Principles

Coordination: With local government, coordinating agencies, and other actors to avoid overlapping, gaps and ensure efficiency.

Transition: Ensuring a smooth transition to safe secure housing, avoiding households becoming "stuck" on their pathway to recovery.

Self-recovery: Supporting the self-recovery efforts of the affected population, using enhancing existing, skills, and capacities.

Build Back Safer: Ensuring that families and communities are supported to design, construct and maintain their shelter and settlements in ways that reduce their vulnerability to future hazards.

Participation: Encouraging participation at all stages including assessments, procurement, design, construction, monitoring and evaluation.

Engagement: Shelter assistance solutions should be negotiated with local government, addressing specific vulnerabilities, hazards, local policies and capacities, actively engaging affected communities in the discussion of their future.

Accountability & Transparency particularly to affected population should be mainstreamed in all shelter programs.

Protection: Programs must ensure that human rights are respected.

Gender & Diversity: Women, men, girls and boys of different ages and backgrounds have distinct needs and capacities and it is vital that shelter programmes incorporate them into the design and implementation of projects.

Vulnerability: The most vulnerable members of society, through prioritisation of assistance programs and through adjustment of programs to the specific needs of vulnerable groups.

HLP: Housing, land and property (HLP) rights including the right to an adequate house, protection from eviction (security of tenure) and other HLP rights should be respected and supported. Shelter programs should include assistance for vulnerable families to improve their HLP status and should not discriminate on the basis of tenure.

Key Parameters

Safe: all programs should include and model the 8 key shelter cluster DRR messages.

Foundation: That hold the building up, down and from toppling over, resistant against pests and rot.

Tie-down: from the bottom up: ensuring continuous tie-down though all elements of the construction from the earth to the top of the building.

Bracing: In both directions in each plane of the building, from strong point to strong point, designed to act in both tension and compression.

Roofing: Wind resistant shape, of adequate strength and fastenings.

Adequate: All programs should ensure the adequacy of their shelters.

Space: As per Sphere standards 3.5m^2 per person, 18m^2/HH undercover space and 45m^2 settlement area.

Durability: For the period of intended use, min 2yrs for temporary and 9yrs for permanent.

Drainage: Fall of 100mm over first meter from house and pathway for water to drain away.

Ventilation: Min1m^2 opening in two walls of the structure, Min 1/2m^2 ventilation to all rooms.

Ceiling height: Min floor to ceiling height at the lowest point of the walls of 2.1m (7ft).

Privacy: The design should allow addition of at least one internal division to ensure privacy.

Security: Should be securable to ensure personal safety and safety of goods.

Accessibility: Address the needs of those with reduced mobility.

Appropriate: All programs should be designed to be appropriate to the affected community.

Culturally: Respect expression of cultural identity and ways of life using locally available material, design and technologies.

Local context: Addressing the particular needs of communities such as urban versus rural context.

Environmentally: Minimise adverse impact to and from the local and natural environment, enhancing the environment where possible.

Climatically: Enhance human thermal comfort by reducing radiation and increasing air flow. Allow for protection from tropical rains and strong winds.

Access: All shelter programs should ensure access to the facilities required to carry on daily life.

Cooking: Ensure access to culturally appropriate food storage, preparation and cooking facilities.

WASH facilities: Ensure access to appropriate water & sanitation incorporating hygiene promotion.

Livelihoods: Ensure ongoing access to existing livelihoods and where possible support the repair of damaged livelihoods as well as creating new livelihood opportunities.

Community facilities: Ensure access to communal facilities such as health care facilities, schools, government offices and public transport.

Settlement Planning should address the holistic design and development of both new and existing settlements, (villages, towns, cities, and their neighbourhoods), considering not only houses on individual sites and its safety, but also the infrastructure and services which surround and support them such as networks, (transportation, sewage systems, electricity supply) and community facilities (community centres, health care centres, schools, market places, places of worship, parks and playgrounds).

2.5 DESIGN PRINCIPLES

Climate Suitability	- Ventilation	Design of the shelter to allow adequate ventilation to reduce internal temperatures. The design should allow for climate suitability improvement (e.g. option to include further openings, to add further partitions).
Social/ economical Suitability	- Locally available material, utilising familiar techniques - Options for further improvement - Accessibility	Local procurement, where availability and available quality permits, should be prioritised; this stimulates local economy and reduces unnecessary transportation costs. Use of well-known materials and techniques will promote the participation of the beneficiaries in construction process and its maintenance. Use of familiar construction techniques will allow families to make improvements as money becomes available. Shelters should provide options for access of disabled people.
Cultural suitability	- Typology according to household activities, privacy and gender as well as options/capacities of reconstruction.	Design shelters to meet local household activities, as well as local cultural requirements. The design of the shelter should enable flexible use of both available interior and exterior space. Respect design and techniques adopted by beneficiaries when building their own shelter.
Resource effectiveness	- Use salvaged materials. - Allow future reuse of materials. - Minimize impact on natural resources	The use of salvaged materials is encouraged when in good condition (bricks, door/window-frames, roof beams etc.). Provide best practice guidance on material selection and re-use to prevent detrimental construction methods. Select quality construction materials for transitional shelters that can further permanent solutions. Consider construction techniques that enable dismantling and reuse of materials. The choice of materials should avoid increased pressure on limited locally available natural resources.
Appropriate Location	- Location - Land tenure	Shelter should be constructed at or near the existing homestead, without inhibiting permanent housing process. Minimise exposure to hazards: avoid hazardous locations and apply DDR recommendations. Take account of access to livelihoods- the ability for small business and trade in or near the location. Ensure proper land rights for minimum 10-years tenure for permanent

		sites.
Site Risk Mitigation	- Cyclone - Hurricane - Earthquake - Rains and Floods	Shelter design must include earthquake and cyclone, hurricane resistant techniques (Build Back Safer). Shelters to be built on safe portions of land. Drainage of the area around the shelter to be examined. When necessary, construct water diverting features or rainwater containment.

2.6 EMERGENCY SHELTER AND NFI INTERVENTIONS.

Emergency shelter support should be in the form of tarpaulins with materials such as ropes, fixings and some tools to secure them. Tents may also be an effective means by which people can return to their home sites. Non-food items may also be appropriate to deliver in the emergency phase. These can include household and tool kits, blankets and kitchen utensils. It's strongly recommended to support people by providing safe shelter awareness, at least through distribution of relevant Information Education and Communication (IEC) material[10], especially for the proper use of tarpaulins, in order to extend the lifespan of emergency shelter provided.

These may be distributed in –kind if available, but in some contexts it may be possible to do a voucher system (or CTP) if the market could supply these products. In general, Fiji has a well-developed private sector capable of supplying considerable quantities of hardware. Where possible, cluster partners should be advised of the areas of distribution to avoid both over-lapping and to minimise gaps.

Fiji's extended family unit may also be able to provide emergency shelter to families, either in nearby villages or with relatives in the cities.

In particularly vulnerable locations that are prone to future disasters, inhabitants should be encouraged to seek safer locations as early as possible. This is not always achievable, given land tenure arrangements or even personal preference. In such cases of families staying in high-risk areas, then it should be ensured that temporary housing solutions are at least re-locatable.

2.7 SUPPORTING SELF-RECOVERY.

Because a large percentage of Fiji's housing stock outside of major cities is owner built, local, and in particular rural, householders are quick to self-recover. This normally takes the form of recycling salvaged materials and building makeshift shelters on, or near, the site of the pre-cyclone house. Tarpaulins maybe stretched over remaining roof frames.

Within the traditional village structure there is a strong tradition, and obligation, for housing to be a communal responsibility. While there may be villagers specialised in carpentry, who assume a role of supervisory guidance, it can be assumed that many men in the village have construction experience. With this skill base it is possible for villages to 'self recover'. However, with the introduction of modern

[10] Relevant IEC material could be found on shelter cluster website
http://sheltercluster.org/sites/default/files/docs/ifrc_shelter_tool_kit_instruction_flyer_1.pdf

materials, and the upgrading of construction standards, it has become apparent that traditional skills alone are not sufficient to produce a disaster resilient house.

It is also apparent that modern materials cannot be procured from the surrounding environment, as with traditional building materials, but rather must be purchased on the market. Interventions as assistance to self-recovery should include both technical guidance and some level of supply of building materials.

2.8 BUILDING BACK SAFER.

a. What is the Building Back Safer (BBS) approach

Building Back Safer (BBS) approach has replaced Building Back Better (BBB) approach because what constitutes a 'better' house is largely a value judgment.

BBS involves building structures that have improved capacity to survive hazards. It also involves working with the occupants of the buildings to respond and recover from these incidents.

BBS recognises coping mechanisms and traditional construction methodologies which are at the core of vernacular architecture; therefore shelter interventions should respect and promote expressions of cultural identity and ways of life using locally available materials, design and technologies.

Strategies to increase long-term resilience are considered essential through promotion and use of the building code and related regulation when possible.

b. Building Back Safer 7 key messages

The Shelter Cluster in Fiji has agreed on the 7 Building Back Safer (BBS) principles and key messages which should be considered as a priority for BBS awareness and training programs: (1) Building Location/Site of the building, (2) Foundations, (3) Fixings/Connections, (4) Bracing, (5) Roof, (6) Accessibility and (7) Preparedness:

1. SITE YOUR HOUSE SAFELY:

- ✓ *Build your house on a safe site by identifying and trying to avoid potential hazards in your location and build as well as you can to resist them.*
- ✓ *Certain vulnerable sites need to be avoided, such as hilltops, coastal zones, flood plains and valley mouths.*
- ✓ *Raise your house in flood-prone situation*

2. BUILD ON STRONG FOUNDATIONS:

- ✓ *Build Deeply anchor your house to the ground with strong foundations, setting the posts at least .75 metre deep in the ground. Posts and stumps should be spiked and set in concrete.*
- ✓ *Ensuring foundations are suitable to your building's location and ground conditions*

3. TIE-DOWN FROM BOTTOM UP & USE STRONG JOINTS - NAILS ARE NOT ENOUGH:

- ✓ *Ensure that you have strong connections at all joints – the roof material to the roof timbers, the roof to the walls and the walls to the foundations.*
- ✓ *Houses have from 5 to 9 joints, each one of which must be reinforced with more than nails.*
- ✓ *Build every joint so it can't be pushed or pulled apart. Nails alone are not sufficient to hold joints together when subject to cyclonic forces. Strong connections can be made with cyclone straps, rope and wire.*

4.BRACE AGAINST THE STORM:

- ✓ *Strong bracing stops your house being pushed over or pulled apart by the wind.*
- ✓ *Brace between the strong points of your house.*
- ✓ *All wall and roof panels should be diagonally braced.*

5. A GOOD HOUSE NEEDS A GOOD ROOF:

- ✓ *Build your roof with the right shape and pitch, and nail down well to protect against a storm. A roof with 4 slopes (hip), and slopes within the 30 to 45 degree range, is best able to cope with cyclonic winds.*
- ✓ *Roofing iron is best secured with cyclonic screws, with each flute fastened around the edges.*
- ✓ *Porches & verandas should be constructed on separate wall plates, rather than be continuous with the main roof. Eaves should be minimized, with 450mm considered the maximum span.*

6. LEAVE NOBODY BEHIND:

- ✓ *Building Back Safer should include the minimum measures to enhance accessibility of your house to people with current or future physical impairments. It's cheaper to include them while rebuilding rather than to retrofit later on your house.*
- ✓ *Site the house such that any steep slope is at the back, rather than at the entrance.*
- ✓ *Ramps instead of (or as well as) steps. Ramps should have a slope of between 1:10 and 1:12, be at least 900mm wide, have a non-slip surface and a kerb on each side.*
- ✓ *Handrails should be installed, at a minimum, on the ramp, porch, toilet and shower.*
- ✓ *All doors a minimum of 900mm wide, with a lever-type handle about 1 metre off the floor, and there should be no doorsill.*
- ✓ *Toilet/bathroom/shower doors should all open outwards.*

7. BE PREPARED.

- ✓ *Preparedness is critical because it is the main way to reduce the impacts of a disaster.*
- ✓ *All openings in walls should have a means of Shuttering. It is important to start taking actions and prepare now.*
- ✓ *If a disaster is coming you should tie-down your house, protect windows and openings, elevate valuable items during floods, secure loose items so they won't be blown away.*

c. Building Back Safer trainings

It is apparent that training both builders and owner builders in stronger building techniques should be an integral part of a self-recovery program. The aim of the Building Back Safer trainings is to ensure that there is a coherent approach towards strengthening the Building Back Safer principles for humanitarian actors working with the Fijian Government so that the country can better withstand future cyclones.

The BBS technical training aims to support communities' self-recovery and reconstruction. By enhancing carpenters and homebuilders understanding of Building Back Safer construction methods in the villages and settlements, through 'learning by doing', these trained community members would then be more able to support other households in the reconstruction of stronger and more resilient shelters.

Public awareness of the need to build stronger houses, while necessary, is not sufficient to ensure that the message is actually translated into improved construction. For this to happen there must be training workshops targeted to local carpenters and builders. And this training in the long run must be incorporated into certificate and apprentice construction courses. For Fiji these workshops must be practical and 'hands on', where participants learn by doing.

d. Building Back Safer Information Education and Communication (IEC) material

It is also ideal if any shelter activity as training, workshop or repair assistance can be accompanied by a selection of BBS posters and brochures, which can remain in the community or the household.

Shelter Cluster Fiji – Building Back Safer - Information Education & Communication (IEC) Material	Link to document	Source
Help for Homes - Tips to Build Back Safer - A5 booklet (in English) - Compilation of IEC Material developed after TC Winston. *To be translated in Fijian Hindi and Fijian (TBC)*	https://www.sheltercluster.org/sites/default/files/docs/2016.09_build_back_safer_booklet_v7_small.pdf	Shelter Cluster Fiji
Building Back Safer tips - 2 posters (in English) **-** IEC material (updated after TC Winston)	https://www.sheltercluster.org/sites/default/files/docs/build_safer_2016_english.pdf	Shelter Cluster Fiji
Building Back Safer tips - 2 posters (in Fijian) - IEC material (updated after TC Winston)	https://www.sheltercluster.org/sites/default/files/docs/build_back_safer_poster_2016_2_page_fijian.pdf	Shelter Cluster Fiji
Building Back Safer tips - 2 posters (in Fijian Hindi) - IEC material (updated after TC Winston)	https://www.sheltercluster.org/sites/default/files/docs/build_back_safer_poster_2016_2_page_hindi.pdf	Shelter Cluster Fiji
Building Back Safer - A Little Money Poster (in English) **-** IEC material (developed after TC Winston) *To be translated in Fijian Hindi and Fijian (TBC)*	https://www.sheltercluster.org/sites/default/files/docs/22.07.2016_uni_a_little_money_poster_a3_v1.jpg	Shelter Cluster Fiji
Building Back Safer - When nails are not enough - Poster (in English) **-** IEC material (developed after TC Winston) *To be translated in Fijian Hindi and Fijian (TBC)*	https://www.sheltercluster.org/sites/default/files/docs/22.07.2016_uni_when_nails_are_not_enough_poster_a3_v1.jpg	Shelter Cluster Fiji
Building Back Safer - Retrofit your EXISTING house - Poster (in English) **-** IEC material (developed after TC Winston)*To be translated in Fijian Hindi and Fijian (TBC)*	https://www.sheltercluster.org/sites/default/files/docs/22.07.2016_uni_retro_fit_your_house_a3_v1.jpg	Shelter Cluster Fiji
FIJI: Coping with Cyclones & Other Natural Risks - Learning From History - Poster (in English) **-** IEC material (developed after TC Winston, in partnership with CRATerre) *To be translated in Fijian Hindi and Fijian (TBC)*	https://www.sheltercluster.org/sites/default/files/docs/fji_local_housing_coping_strategies_poster_def_0.pdf	Shelter Cluster Fiji / CRATerre

2.9 USE OF CASH AND VOUCHERS IN FIJI.

TO BE COMPLETED

2.10 ASSESSMENTS AND MONITORING

TO BE COMPLETED

2.11 DOs AND DONTs OF DISTRIBUTION IN FIJI.

It is important to understand the protocols for working in Fiji at both the government and village level. Agencies must introduce themselves at the Divisional level and explain their proposed plan of action. From here it is possible to have introductions at provincial or council level. Working in villages would then require contact with the chief or headman, while working in many settlements would require contact with the local committee.

2.12 LOGISTICS

SEA FREIGHT. Fiji is serviced by many international and national freight lines, and has international ports at Suva, Lautoka and Labasa. Importation of shelter items through these ports should be done through a shipping agent who is familiar with customs, quarantine, and VAT issues. They also will have connections to facilitate land transport as well as on-freight to out-lying islands. Many islands are serviced only by a ferry/freight service, there being no airline service. These services can be affected by the weather, and cargo space may be restricted, so advanced planning will be necessary in many situations.

AIR FREIGHT. Fiji is serviced by international airlines largely through Nadi, but also with a few direct flights to and from Suva. Inter island flights are scheduled on a regular basis for most major cities and islands, but a range of charter services are also available.

For both Sea and Air Freight see; www.yellowpages.com.fj - Freight Forwarders (incl. custom clearance)

You could access more information on Logistic Cluster website http://www.logcluster.org/countries/FJI

2.13 DEFINITION OF HOUSEHOLD AND AVERAGE SIZE IN FIJI

Note: These information, from Fiji Bureau of statistics are extracted from the 2007 Census Analytical report that could be downloaded on
http://www.statsfiji.gov.fj/component/advlisting/?view=download&format=raw&fileId=1870

Households and families are the fundamental units of all societies and information should preferably be available for both. However from the data collection point of view, particularly in censuses, the household is a far more convenient unit of enumeration than the family. With regard to location, the household is usually specific whereas this is often not the case with families. This is particularly important in many developing countries where the family may embrace an entire clan.

Censuses (as well as surveys) conducted in Fiji have always used the household as the basic unit of data collection. It is therefore essential that the concept household and conditions for household membership are precisely defined and known by all census (survey) staff. As during the previous censuses, the 2007 census household was again defined as consisting of :

"those persons who usually eat together food prepared for them in the same kitchen and who together share the work and cost of providing the food."

A household may consist of one or more persons and may occupy a whole building, part of a building or many buildings. It is important to stick to the correct interpretation of a household. It should, however be kept in mind that in the majority of cases, the household will be a family living in a single dwelling.

The above household definition implies that:

· Two or more groups of persons living in the same dwelling but each with their own separate eating and housekeeping arrangements are considered as two or more separate households.

· A domestic servant eating with the household is included with this household. However, if this domestic servant cooks and eats separately, he/she will be considered as a separate household.

a. Households by ethnicity and geographic sector

Table X-1 presents the number of households and persons by ethnicity and geographic sector, enumerated in Fiji during the 1996 and 2007 Censuses. Some households consist of persons with a different ethnic background. These households have been classified according the ethnicity of the head of household. As expected, during the most recent intercensal period 1996-2007, the proportion of Fijian households has drastically increased whereas the proportion of Indian households has drastically decreased. This is the case for both geographic sectors but more so for the rural than for the urban sector.

Table X-1: Households and persons in these households (nr and %) by ethnicity and geographic sector in 1996 and 2007.

Ethnicity	All Sectors				Rural Sector				Urban Sector			
	Households*		Persons		Households*		Persons		Households*		Persons	
	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%
2007 Census												
Total	**174,117**	**100.0**	**829,932**	**100.0**	**85,588**	**100.0**	**409,529**	**100.0**	**88,529**	**100.0**	**420,403**	**100.0**
Fijian	88,826	51.0	470,328	56.7	51,865	60.6	261,864	63.9	36,961	41.8	208,464	49.6
Indian	74,601	42.8	312,646	37.7	31,032	36.3	135,672	33.1	43,569	49.2	176,974	42.1
Other	10,690	6.1	46,958	5.7	2,691	3.1	11,993	2.9	7,999	9.0	34,965	8.3
1996 Census												
Total	**144,239**	**100.0**	**767,756**	**100.0**	**76,555**	**100.0**	**413,726**	**100.0**	**67,684**	**100.0**	**354,030**	**100.0**
Fijian	66,782	46.3	389,114	50.7	41,215	53.8	230,961	55.8	25,567	37.8	158,153	44.7
Indian	68,978	47.8	337,606	44.0	33,088	43.2	170,647	41.2	35,890	53.0	166,959	47.2
Other	8,479	5.9	41,036	5.3	2,252	2.9	12,118	2.9	6,227	9.2	28,918	8.2

Note *These are households living in private dwellings (PD) only

2007 Census Analytical report, p 325 (Bureau of statistics)

b. Average household size

The average household size at the time of the 1996 and 2007 Censuses is presented in Table X-2.Users are again reminded that the averages in this table only include households residing in private dwellings (PD). The inclusion of households in non-private dwellings (NPD) would lead to meaningless averages. During the inter-censal period, the average household size for all sub-populations by ethnicity and geographic sector has continued to decrease.

Table X-2: Average household size by ethnicity and geographic sector in 1996 and 2007

Census	Ethnicity	All Sectors	Rural Sector	Urban Sector
2007	**Total**	**4.8**	**4.8**	**4.7**
	Fijians	5.3	5.0	5.6
	Indians	4.2	4.4	4.1
	Others	4.4	4.5	4.4
1996	**Total**	**5.3**	**5.4**	**5.2**
	Fijians	5.8	5.6	6.2
	Indians	4.9	5.2	4.7
	Others	4.8	5.4	4.6

2007 Census Analytical report, p 326 (Bureau of statistics)

2.14 ABOUT LOCAL BUILDING CULTURE IN FIJI

Note: These information, are extracted from the "Baseline Data on local building culture & coping strategies" developed by CRAterre in March 2016 that could be downloaded on http://shelftercluster.org/sites/default/files/docs/fiji_baseline_data_on_local_building_practices_coping_strategies_craterre_final.pdf

a. Land tenure

Fiji is divided into provinces which consist of several *tikina* (districts). Each *tikina* is made of several *koro* or villages. More than 80 percent of the land is registered by the land owning unit (*mataqali* / clan) of Indigenous Fijians while the others include State hold, freehold land and leases. In the past decades, an important migration from rural to urban areas has been registered, leading to several squatter settlements located in risk-prone areas. Settlement refers to place of residence on lease, owned land, or at will apart from villages.

b. Local housing & constructions types

Existing housing can be subdivided according to various quality and materials used. Low-cost and/or owner-built houses can be classified into one of the three categories: traditional, transitional or formal housing.

Traditional housing:
lightweight flexible construction and 4-slope hipped roof for better wind resistance

Transitional wooden housing:
partial damage after 2016 cyclone Winston

Formal low-cost housing:
cement block masonry with anchoring for roof structure

Transitional CI sheet housing:
elevation on stilts for better protection from floods

Remarks on the three construction types:

• According to recent census, only a very limited portion of the population is actually living in traditional housing, so-called bure. Most of the families live in “temporary” (lean-to, vale vkakenani) and “permanent” (bungalows, vale tudei) dwellings.

• Building materials for the transitional and formal types must be imported in significant quantities from outside the country and then shipped from distribution points. This increases the overall cost and can result in long waiting periods before a house can be assembled. This situation is further exacerbated in the aftermath of a disaster increasing recovery time and costs.

• Generally, traditional and transitional houses have external kitchens in a detached small building and pit-toilet located outside.

• Kitchens and additional buildings, which are usually much less sturdily built than the homes, are frequently almost totally wiped out during cyclones and earthquakes. Flying debris from the structures (occasionally even the entire units become airborne) often causes sever damage to houses that might otherwise have weathered the storm.

c. Traditional housing

Fijian traditional housing is often referred as *vale vaka-viti* (Fijian’s house) or *bure* in present days, although originally *bure* meant men’s house. This type of house is still found in large numbers throughout the country, with a great variety of shapes, architectural styles and materials used. These one-room thatched houses are particularly well adapted to the local climate and environment. They are comfortable, inexpensive to build and maintain, and often display great craftsmanship and woodworking skills in their construction.

Various types of traditional housing across the country (©Intertect)

Traditional house: woven mat walls are fixed on the outside with additional wood elements to improve resistance to wind pressure; the top of the roof is reinforced with an additional layer of special grass tied to a timber beam protrunding from two sides of the roof

Scattered houses and tree barrier for reduced vulnerability to wind

A net of woven reeds is applied on the rafters to better fix the thatching

Elevated stone platform for protection from floods and soil erosion.
Small eaves and steep roof for reduced vulnerability and improved durability

Structure

Foundations. Platform of large boulders and earth raised from a foot up to 3 or more feet from the ground. On the inside the floor is covered with coconut leaf mats.

Main structure. Strong corner posts and wall posts from hardwood round timber set in the ground before the construction of the stone platform.

Roof. A wooden roof frame erected on top of the posts lashed together by coconut fibre ropes and covered by a thatch made from grass (pandanus) or other palm leaves stitched together and laid in sections overlapping one another. In recent years, many thatched roofs have been replaced by corrugated iron (C.I.) sheets.

Walls. Mats made of woven bamboo or reeds are attached on the external side of the posts, often supported by small vertical posts to reinforce the walls in the centre. In some areas, grass thatch walls are also used.

Connections. Traditionally, the house is bound together with ropes made from coconut fibre (magimagi) or other natural materials.

Resilient construction practices

• Settlement pattern with scattered buildings helping to cut the wind flow reducing the impact on construction.

• Vegetation belt around the settlement help to reduce the speed of strong winds.

• A 45° hipped 4-sided configuration of the roof as protection against strong winds.

• Steep slope of the roof allows rain to shed quickly and away from the house, improving durability of thatching.

• Few inches eaves reducing uplift and risk of damage to the roof under strong winds.

• The house elevation on mounds protects from flooding and storm surges.

• Stones are placed all around the elevated mounds filled with soil to protect from erosion.

• Strong hardwood corner posts buried sufficiently to resist uplift.

• Lightweight and rope tying providing ability of the structure to bend and sway without collapse (ductility) during cyclones and earthquakes.

• Round shapes gables for improved wind resistance.

• Even though extensive structural damage may result from cyclones, a total collapse of the bure is rarely lift-threatening as they are lightweight structures and, because they are woven together, components will not fly off to cause major harm to the occupants.

Construction weaknesses

• Modifications to bure construction, such as the use of nails, iron roofing and the reduced use of some traditional hardwoods because of their limited availability, render many recent built bure more vulnerable.

• Possible lack of rigidity and bracing of the structural frame.

• Possible lack of stability of the overall structure if the base of the posts is rotten.

• The primary causes of structural failure are generally:

- separation of the roof from the walls caused by uplift and failure of the connections between the roof and walls;

- collapse of the walls resulting from lack of rigidity in the centre portion of the wall;

- failure of the corner post due to deterioration of the wood in the ground.

Bioclimatism & confort

• Improved ventilation thanks to the elevated floor, the reduced width of the house and a high thatched roof.

• The thickness of the walls varies according to climate. In dry areas rows of reeds are lashed together and form a screen which allows ventilation. In wet areas this screen is lined with thatch on the outside.

• Houses were built with open frames with generally no interior subdivision. Control of privacy, security, wind, and wind-blown rain are provided with lightweight moveable screen elements.

• Houses are very dark and dim inside as no windows are provided to reduce the strong outside light and to keep a cool indoor temperature.

Lifespan & maintenance

• The hot and damp climate limits the durability of the buildings to approximately 20 years. However, if well constructed it may last for 30 to 40 years.

• A particular types of reeds are tied together to thicken the topmost part of roof thatching.

Construction process

• The relatively narrow width decreases structural spans and the need for heavy structural members.

• For a medium size bure, it takes about 2 weeks for the material collection and 4 weeks for the construction with 8 men and the master carpenter.

• Traditionally, housing construction was always carried out by the collective work of village people. It began with a person who wished to construct a new one or to re-thatch the roof conveying the request to the chief who was in charge of organizing village meetings to discuss whether the construction was necessary. Once the village people agreed, they decided who involved and what tasks each had.

• Materials used for the traditional housings are obtained in and nearby villages. The carpenters and fellow members have an extensive knowledge on location and availability of resources for construction.

• Traditional construction in villages has been replaced by housing with newly introduced materials and styles in the latter half of the XXth century. It is hardly practiced in most villages in present day, however, there are still elderlies who have knowledge and skills based on their past experience.

• The 200 years old village of Navala, situated in the Nausori Highlands, still maintains today its traditional way of building and living as a result of the decision by the village committee.

• In recent years there has been a general decline in the level and quality of building skills that is evident in the damage levels observed after recent cyclones. For example, the timber posts which form the main structural components of the bures are insufficiently imbedded in the ground. Roofs that were traditionally bound together and to the main frame of the building are now nailed, with a dramatic loss in strength.

d. Transitional housing

Transitional houses are temporary or interim structures erected by families until they can afford more formal houses. In addition to the type of materials used, a usual criteria to determining if a house is formal or transitional is by whether or not it has interior running water and sanitary facilities. Transitional houses are the most vulnerable type of buildings, frequently adopted by squatters to whom lack of title to land is a disincentive to make improvements, and by people living from subsistence farming in rural areas which the limited cash income does not allow to make many improvements on housing.

Wall types of transitional timber-framed housing (from left to right): with woven mats, CI sheets and timber boards (©Intertect)

Timber-framed house: the elevated floor protects from soil humidity

CI sheet house: tilting shutters can be easily fixed during cyclones

Structure

Foundations. None or in some cases short concrete piers.

Main structure. Saw timber frame with elevated wooden platform

Roof. 1-side sloping or 2-side gabled roof covered with CI sheets and more rarely with pandanus thatch.

Walls. Palm or bamboo woven mats, CI sheets, timber boards

Connections Nails

Resilient construction practices

• Construction on stilts as protection from floods, coastal erosion and sea level rise.

• The platform is generally elevated above the ordinary level of local floods.

• Large corner posts anchored to the ground providing enough strength to hold down the building during strong winds.

• Corner bracing is sometimes used to improve the strength of the structure.

• Flexible materials and lightweight structures that can sway and bend during earthquakes with reduced risk of injury in case of collapse.

Construction weaknesses

• Sometimes, there is some provision for anchoring the frame to the concrete pier, but usually the building simply rests on the posts greatly increasing the vulnerability of the whole house that can be lifted off and toppled over during cyclones or slip from the piers during earthquakes.

• Corrugated iron sheets if poorly attached to wooden frames (nails frequently too short) can fly away and cause serious injuries and damages during cyclones.

• Weak connection of walls to the frame, especially in the corners, can cause walls separation and "box explosion" under strong winds.

• Low angled, gabled roofs with large overhanging caves are very vulnerable to strong winds.

• When construction budget is limited, there is a tendency for using less CI sheets resulting in a reduced slope of the roof with an increased vulnerability to wind and higher risk of tearing off.

Bioclimatism & confort

• Woven mat walls allow for improved ventilation as air can pass through while CI sheets considerably increase heat inside.

• Tilting wooden shutters protecting from sunlight while ensuring cross ventilation.

• Increased ventilation and protection from ground moisture thanks to the elevated platform.

Lifespan & maintenance

• Woven mats if properly maintained can will last for many years and can be upgraded by replacing them with boards.

• Elevation of the base of the posts for protection from moisture and increased durability.

Construction process

• These houses can be built very quickly in a matter of a day or two with extensions made over time.

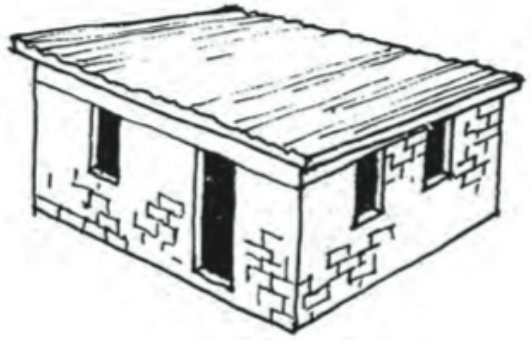
• In squatter dwellings, materials come generally from former houses and wood is collected from the nearby timber mills or "borrowed" through relatives and friends.

• Thanks to their lightweight they can be easily moved.

• Wood frame houses were in the past affordable to almost all income groups. In the last decades, because of the cost of lumber, this type of house has become almost as expensive to build a cement block and steel house.

e. Formal low-cost housing

Owner-built and government-subsided housing consists of a variety of concrete block and more formal wooden frame structures. In addition, this category also includes government-aided housing often built after a disaster using a variety of prefabricated panel systems transported to the affected areas and erected on site.



Ordinary formal low-cost housing with cement block masonry (©Intertect)

Government-subsided low-cost housing

Structure

Foundations. Cement block wall, cement foundations

Main structure. Cement block masonry walls unreinforced or reinforced with steel rods; wooden frame

Roof. 1 sloping, gabled or hipped roof Timber structure with CI sheet covering

Walls. Cement blocks; timber boards

Connections Steel rods, nails

Resilient construction practices

• Connection of the roof structure to the masonry walls:

- A portion of the steel rods used in the reinforcing columns is left protruding out of the ring beam. A boars plate is laid on the top of the ringbeam with a hole drilled for the rod to pass through. The rod is bent over to hold the plate down. The roof trusses are then attached to the plate.

- Bolts are imbedded in the cement when the ring beam is poured. The plate is then attached by bolting it down.

Construction weaknesses

• If properly built, a concrete block house can withstand the forces of both earthquakes and windstorms. If improperly built and reinforced, this type of construction is the most dangerous. Damage caused by the wind pushing against an unreinforced or poorly reinforced wall can cause collapse due to excessive wind pressure on the outer surface of the wall. Total or partial collapse can cause serious and deathly injuries due to the weight of cement blocks.

2.15 LOCAL COPING SRATEGIES

Note: These information, are extracted from the "Baseline Data on local building culture & coping strategies" developed by CRAterre in March 2016 that could be downloaded on http://sheltercluster.org/sites/default/files/docs/fiji_baseline_data_on_local_building_practices_coping_strategies_craterre_final.pdf

a. Vulnerability reduction practices for construction

• Lightweight collapsible houses if cyclones or earthquakes are stronger than the capacity of the construction to withstand. By doing so, the occupants will not be injured and a new structure can be quickly and easily rebuilt using materials available from the former house.

• Systems to secure and stabilize the building or some of its parts:

- Roofs and windows are secured by tying together the ends of two dry coconut leaves and laying then over the roof, with the heavy base hanging downwards.

- Tying the roof down with ropes and fastening it to large sturdy trees.

- Banana leave veins woven and tied with green coconut leaves and use them to cover the thatched roofs to keep them intact.

- Tyres, heavy cement bricks and sacks filled with sand are placed onto CI sheet roof to avoid blown off.

- Cutting of big trees near the house.

• During cyclones, bure roofs were often blown off in one piece and deposited on the ground nearby, where because of their shape they provide a very safe and stable shelter for the people who crawl underneath and sit upon the rafters. In traditional times, this process was frequently hastened and made less hap-hazard by removing the roof before the wind.

• During floods, some communities live on shelves strung on the rafters, diving in and out of the door and cook and move around on rafters of bamboo and banana stems.

• Fijians traditionally prepared for each hurricane season by propping up and tying down houses on the month of October, when the season of storms and cyclones is supposed to start. Nowadays they usually wait for more immediate signs, or radio announcements; however, some practices for vulnerability reduction are still in use (for example, tying to roof structure to nerby sturdy trees).

b. Additional coping strategies for disaster preparedness & recovery

Community cooperation & self-help

• The chief's house was traditionally used as the evacuation centre and recent assessments reported that bures are still today often used as communal shelters during cyclones.

• From the onset of disasters, most communities display considerable cohesion as members provide mutual assistance: for instance for cleaning up of debris and putting the village back into a liveable condition, sharing of meagre resources.

• Where there was widespread destruction building materials (reeds, pandanus, or bamboo) may have become scarce, but access to them through inter-community linkages was undoubtedly a common occurrence. Community cooperation was a key to post-disaster recovery: affected households could stay with other communities while waiting for recovery and non-affected communities could assist affected communities in the recovery process, bringing foods and building materials.

• Following a disaster, many affected households have arranged their own repairs through voluntary involvement of family and local communities, instead of deferring the repair works until the arrival of some form of government or civil society assistance.

Traditional warning systems

In rural willages, people know several natural warning signs foretelling a cyclone. Traditional effective practices- such as blowing the conch shell or beating wooden drums- are still used today to issue disaster warnings to complement modern technical methods.

Season calendar

The names of the months refer to various natural phenomena. For instance, the period from March to May is known as the “rainy season” when heavy rains are expected while the period from December to February is often called “hot season” or also “sail-wrapping season” to indicate that sailling is not normally undertaken because of the danger of cyclones.

Famine crops & disaster-resistant food

After crisis, communities were relatively self-sufficient in food resources thanks to their knowledge about comestible wild plants, the use of a wide range of plants able to resist to various natural hazards and supplementary crops - so-called “famine crops” - that were rarely consumed in time of plenty.

Among traditional means of food preservation, particular cooking and drying processes were also used to prepare long-lasting emergency reserves that can be stored for 15 months without deterioration

Scatered crops & land fragmentation

In rural areas, crops were scattered in different locations with differential vulnerability between species and sites to reduce the risk of a total devastation from extreme events.

2.16 FIJI HOUSING SECTOR, From TC Winston PDNA Summary

Note: These information, are extracted from the “Post-Disaster Needs Assessment Tropical Cyclone Winston, February 20, 2016” that could be downloaded on http://sheltercluster.org/sites/default/files/docs/post_disaster_needs_assessments_cyclone_winston_fiji_2016_online_version.pdf

Prior to the havoc wreaked by TC Winston, Fiji was a relatively well-housed nation in terms of number, size and quality of its housing stock albeit housing conditions lack uniformity across all areas. Around 57 percent of houses consist of reasonably well constructed timber frames with either wood or tin iron cladding, while a further 40 percent are made of concrete/masonry construction. Over the years, the use of traditional bure housing has given way to concrete and fixed timber frame construction, which lends itself to easier fitting of plumbing and electricity supplies. The median floor area of Fiji’s houses are large, on the order of 80m2 (concrete) and 60m2 (timber frame), reflecting a mature housing stock that has been incrementally consolidated by homeowners over a number of years.

Housing Sector Background

No single public agency in Fiji is responsible for housing, and housing-related legislation is spread over at least 14 separate Acts including, for example, the Town Planning Act, Subdivision of Land Act, Public Health Act, Local Government Act and Fijian Affairs Act, all administered by different ministries. In an attempt to address the risks inherent in this fragmentation, in 2011 the government adopted, for the first time, a National Housing Policy, which aims to provide ‘Affordable and Decent Housing for All.’ It encompasses an ambitious and broad range of measures to address Fiji’s housing challenges, including housing assistance

for rural villagers, security of tenure in squatter/informal settlements, coordinated provision of trunk infrastructure to open up new land for housing, rationalizing rents charged by Native Land Owning Units, provision of housing finance and regulatory reforms. Importantly, the policy recognizes housing as a private good and as meeting basic needs, and is a key indicator of social wellbeing. It also strongly endorses the government's move away from direct delivery of housing to involvement in activities that create an enabling environment and to working in partnership with the private sector, NGOs, civil society organizations and communities to address the country's housing needs. The policy not only provides a sound framework for development of the housing sector, but it also contains principles and approaches that would be equally relevant for housing reconstruction following a disaster.

Making use of data available from FBOS[11] and data derived from adjusted modelling undertaken by the 2010 Pacific Catastrophic Risk Assessment and Financing Initiative (PCRAFI), the population of 182,015 households was calculated to be living in a total housing stock of some 146,292 units in 2015, indicating a country-wide occupancy rate of around 1.3 households per building although this was not uniform throughout the country. In a number of provinces in the Northern and Eastern Divisions which are experiencing population out-migration, occupancy rates were below 1, whereas in the faster growing Central and Western Divisions, and particularly in the Suva-Nausori and Nadi-Ba urban corridors, occupancy rates were higher at 1.45 per housing unit, indicating that the supply of affordable housing has not kept up with population growth.[12] In response to unmet demand and opportunities for supplementing household incomes, according to the 2008/2009 HIES, around one in three families in urban areas rented out at least one room in their house and, deriving supplementary income from this activity.

The country's land on which housing is built is codified into three main tenure forms, namely iTaukei (native) land (87 percent), state land (6 percent) and freehold (7 percent). According to the 2011 National Housing Policy, around 63 percent of households lived on freehold or leasehold land and a further 29 percent lived in village settlements where they are afforded secure tenure through their community status (Ministry of Local Government, Urban Development, Housing and Environment, 2011). The high overall security of tenure is reflected in both the quality of the housing stock and median house size. Table 44 shows the wall materials of the pre-Winston housing stock by division.

Table 44: Housing Stock by Type of Wall Material and Distribution by Division

Division	Concrete	Timber frame/ Wood	Timber frame/ Tin iron	*Bure*	Makeshift/ Other	Total No. Units
Central	25,092	12,102	17,676	672	518	56,060
Eastern	2,901	4,691	3,333	207	83	11,215
Northern	2,564	7,122	5,683	539	379	16,287
Western	27,271	9,600	23,660	1,409	790	62,730
Total	**57,828**	**33,515**	**50,352**	**2,827**	**1,770**	**146,292**

Source: MLGHE

The above table indicates that approximately 57 percent of houses consist of reasonably well constructed timber frame with either wood or tin iron cladding, and a further 40 percent of houses are made of concrete/masonry construction. Over the years, the use of traditional bure housing has given way to

[11] FBOS, 2011; FBOS, 2007.
[12] The concentration of the housing deficit in urban rather than rural areas is also reflected in the fact that although urban areas account for 51 percent of the population, they account for only 46.3 percent of the housing stock and, by corollary, the 49 percent of the population which is rural occupies 53.7 percent of the housing stock.

concrete and fixed timber frame construction, which lends itself to easier fitting of plumbing and electricity supplies. The Fijian vernacular bure house type currently constitutes only 3 percent of the overall housing stock, although accounting for 10 percent of houses in the Northern Division and 7 percent in the Eastern Division. Drawing on the digitized building footprints collated under PCRAFI, the median floor area of Fiji's houses are large, around 80m2 (concrete) and 60m2 (timber frame), reflecting a mature housing stock that has been incrementally consolidated by home owners over a number of years. According to a number of construction industry experts consulted during the course of the PDNA, 'like-for-like' house replacement costs would be in the order of F$750/m2 for concrete houses and F$650/m2 for timber frame housing, equivalent to a median house value of F$60,000 (concrete) to F$40,000 (timber frame).

However, the housing characteristics for the estimated 15 percent of the population living in some 240 informal settlements (primarily located in and around the Lami-Suva-Nausori and Nadi-Lautoka-Ba urban corridors and in Labasa town) point to less permanent structures. The settlements are far from homogenous, but based on a 2015 survey of 31 informal settlements,[13] only 10 percent of houses were concrete and the remaining 90 percent were timber frame and tin iron of varying construction quality and, in many cases, built using recycled materials. The lower quality overall in comparison to the wider housing stock is likely to reflect variables, such as a higher incidence of poverty found within many informal settlements and uncertainty regarding tenure security, in particular in those settlements located on privately-owned land.[14]

Within the constraints of available statistics, determining the proportion of women headed households who are home or land owners is not possible. While women's participation in most types of economic activities is not restricted in Fiji, iTaukei women have limited rights to inherit customary land or to own immovable property and, similarly, patriarchal inheritance preferences tend to dominate the freehold and leasehold markets. However, under Section 35 of the Bill of Rights in the 2013 Constitution, the State must now "take reasonable measures within its available resources to achieve the progressive realization of the right of every person to accessible and adequate housing and sanitation."

In an effort to assist lower income groups, the Government of Fiji provides subsidized serviced housing lots and mortgage loans88 for home ownership (Housing Authority of Fiji) or Public Rental Board apartments. A number of privately established and funded social (subsidized) housing schemes exist for the extremely poor and destitute, supported by charitable groups (for example, the Model Towns Charitable Trust), church groups (for example, the Housing Assistance & Relief Trust (HART) and the People's Community Network borne out of the Ecumenical Centre for Research, Education and Advocacy), and NGOs (for example, Habitat for Humanity Fiji). The houses under all these schemes are well constructed from concrete or timber frame/tin iron materials. However, while assisting the housing needs of at least some extremely poor households, as in most countries, the supply of public and social housing has been unable to keep up with demand. The Housing Authority market demand survey in 2013 estimated that demand for units was 18,948, most of which (16,816) were in the Central Division. The Public Rental Board has a waiting list of around 4,600 units. Overall, Fiji's housing stock is largely (90 percent) in private ownership.

[13] Informal settlement survey carried out by the People's Community Network, November 2015.
[14] Informal settlements have grown on all categories of land in Fiji. The settlements on state land (including settlements established 40 or more years ago) tend to be located within town boundaries; settlements on iTaukei land are found within urban areas and also in less regulated peri-urban areas; and a smaller number of settlements are on freehold land.

2.17 FIJI BUILDING CODE & HOME BUILDING MANUAL

The current National Building Code of Fiji was completed in 1990 but was not enacted by Government until 2004 where it falls within the ambit of the Fiji Public Health Act Cap 111. Within the Code reference is made for the compliance with relevant Australian and New Zealand Codes where specific compliance details are not provided in the Code. The code, however, has only been selectively applied and enforced, largely within the cities and as a condition of lending authorities, the insurer and reinsurers. In more recent times the increasing frequency of natural disasters has reawakened the need, at the very least, of ensuring that future construction has the capacity to protect, rather than endanger, lives and for the code to be more widely applied and enforced.

The Code itself is a working document used mainly by building professionals operating in the private industry and the regulating authorities within the urban centres. It was determined that the essence of the Code should be made available to a wider audience by interpreting best practice for the most commonly constructed types of housing. The "Home Builders Manual" also completed in 1990, interpreted code requirements to the then current building practices. This manual provides practical guidelines for the construction of one/two storey houses, plus explains design and siting requirements, as well as fixings, for what would now be described as a Build Back safer approach with the home owner/builder or residential builder in mind.

Following TC Winston and the extensive destruction it brought to public buildings (including schools, which were de facto evacuation shelters) the rebuilding process for public buildings is now proposed to be in line with engineering to withstand a upper cat 2 cyclone for intermediate repairs, to Cat4 cyclone for the long term retrofitting of existing buildings or low cat 5 cyclone as new standards for school buildings and evacuation centre. This may have an impact on standards used in the "Home Builders Manual", so it would be advisable to have all plans verified by a member of the Fiji Institution of Engineers of the appropriate grade, qualification and experience.

Fiji Institution of Engineers, 19 Domain Rd, Suva www.engineersfiji.org.fj

See www.yellowpages.com.fj Engineers- Consulting.

For copies of the National Building Code of Fiji and the Home Builders Manual see

www.sheltercluster.org/pacific/fiji

2.18 PRE-POSITIONING OF NFIs.

The Pacific Logistic Cluster has developed the Pacific Stock Mapping Tool, where main partners are updating on monthly basis their prepositioned and NFIs Stocks in 15 countries in the pacific. The July 2016 update could be found on https://www.sheltercluster.org/sites/default/files/docs/pacific_stock_mapping_-_july_2016.xlsx

For more information, please contact the Logistic Cluster on http://www.logcluster.org/countries/FJI

3 SHELTER AND NFI TECHNICAL SPECIFICATIONS

3.1 TARPAULINS

	Recommended Minimum Standards	Notes
Recommended size of individual tarpaulin or sheet	6m by 4m.	For rolls or large area sheets it's important that they are cut to ensure they are usable, but also maximise their number.
Number of tarpaulins or sheets distributed per family	Family size less than 6 members two tarpaulin or equivalent sheets per family	2 tarpaulins are the accepted minimum international standard.
	Family size greater than 6 members a minimum of two tarpaulins or equivalent sheets per family	Additional tarpaulins should be allocated if supply permits.
	For damaged houses with family size less than 6 members to have one tarpaulin	This to allow roof protection

Some reference for good practice details for fixing tarpaulins and materials can be found on:

Temporary structures in hot climates
https://www.sheltercluster.org/sites/default/files/docs/Temporary%20structures%20in%20hot%20climate.pdf

IFRC shelter kit instructions

https://www.sheltercluster.org/sites/default/files/docs/IFRC%20shelter%20kit%20flyer%20instruction%201.pdf

IFRC shelter kit specification

https://www.sheltercluster.org/sites/default/files/docs/IFRC%20Shelter%20Kit.pdf

3.2 TENTS

Item	Recommended Minimum Standards	Notes
Tent materials	Equivalent to IFRC or UNHCR standard material specifications http://procurement.ifrc.org/catalogue https://www.sheltercluster.org/sites/default/files/docs/IFRC%20Family%20Tents.pdf	The family tent and the frame tent
Life span	Maximum recommended time for tents as a place of main habitation is 3 months.	

Tent planning	Tent site planning and layout can be found on: https://www.sheltercluster.org/sites/default/files/docs/Guide%20to%20the%20Use%20and%20Logistics%20of%20Family%20Tents.pdf	
Fire safety	Tent 'Fire Safety and Winterisation Leaflet' can be found on: http://www.ifrc.org/PageFiles/95528/IFRC%20TENT%20INSTRUCTION%20SHEETS-modified%20by%20%20alpinter.pdf	

A guide to the use and logistics of family tents in humanitarian relief, published by UNOCHA can be downloaded from http://www.josephashmore.org/publications/tents.pdf

3.3 SHELTER TOOLS AND MATERIALS

Contain construction material and tools, and target those at or returning to damaged or destroyed houses in place of origin. The kit should provide necessary support to ensure that minimum sphere standards can be reached. See also: IFRC Shelter Kit Guidelines

Items and Purpose	Details	Value
Tools		
To assist the emergency and recovery construction. Kits to be shared no more than 1 kit per family. The equivalent in cash / voucher may be provided.	Kits to contain (minimum): Hammer Saw 75mm Nails – 0.5kg 40mm Nails – 0.5kg Roof Nails – 0.5kg Rope (6mm) – 30m Shovel	
Fixings construction kit		

Materials, cash/vouchers (if markets are functioning or alternatives like fairs can be arranged)	Galvanised Metal Strap – 25mm x 1mm with punched holes – 54m (2 x 27m rolls) 100mm Galvanised Nails – 2kg 40mm Galvanised Nails – 1kg Roof (Umbrella) Nails – 3kg	
Timber for repair		
To supplement salvaged timber for construction	60 meters of 4 x 2 inch treated softwood timber	
Roof sheets		
Iron roof sheets that are sufficient to cover an area to meet SPHERE standards for transitional and permanent house construction	10' x 2'6", 26 SWG – 10 sheets 10' Verge flashing – 4 lengths	
Materials for reconstruction		
A range of materials that would be needed to construct a 6x4m timber shelter. Other options may be considered	Timber for studs, roof, and floor (4x2) – 270m 2 ½ Galvanised Nails (for cladding and flooring) – 2.5kg Timber cladding (6") – 360m Or CGI (9'x2'6") – 27 sheets Floor Boarding (6") – 160m Or 18mm exterior plywood (8' x 4') – 9 sheets Doors - 1 Window – 2 Finishes – Paints and Preservatives	

For information on selecting NFIs see:
http://www.ifrc.org/PageFiles/95759/D.03.a.04.%20NFIs%20for%20Shelter_IASC.pdf

3.4 TEMPORARY/TRANSITIONAL/CORE SHELTERS

Transitional shelters are shelter provided during the period between a disaster and the achievement of a long-term shelter solution. It provides a habitable covered living space, a secure, healthy living environment with privacy and dignity for those living within it.

The shelters are designed so that material are re-useable for when families can move onto a more permanent site, contributing towards construction of semi-permanent and permanent houses.

All Temporary/Transitional Shelters should have appropriate WASH facilities, particularly in relocation situations.

Indicators	Standards	Foreseen Challenges
Size	Minimum of 18m^2 covered living space for a family of 5	
Timeframe	Structure needs to able to last a minimum of 12-18 months	Ability to move onto permanent site
Location	- Location on plot shall allow further incremental development of shelter - Allow space for DRR measures - 100 families per hectare maximum	Lack of space to add to shelter Lack of access to funds or skill to build
Use of salvaged material	- Only qualified salvaged materials (e.g. avoid burnt, decayed, swollen material) - Check amount of salvaged material available to beneficiaries - Design of shelters not fully to rely on availability of this type of material.	Ensure quality of salvaged materials
Plot preparation	- Properly clear site from physical hazards (e.g. flood and other debris, trees likely to fall, salvaged material, also from neighbouring plots) - Properly prepare site following DRR principles (good compaction of construction site) – Be aware of river silt deposit, not a quality base soil	
Construction process	- If possible apply traditional, well-know construction methods based on existing skills of available labor Construction process to be speedy (pre-fabrication of components reduces on site cutting or drilling) and simplified to enable the participation of semi or un skilled labour.	
Foundation	- Excavation should be deep enough to reach stable or hard soil type. - Ensure good compaction of earth - When possible ensure PCC layer beneath foundation – Raise plinth 6-9” above flood water level. See Flood risk map (attached)	
Floor level	- Raise floor level to prevent ingress of low surface water - height according to location, min. 10cm	

Structure Structure (cont.)	- Inform on simple solutions to improve the shelters resistance: e.g. braces, improved joists, ratio length: width, slope and overhang of roof etc.) - Ensure that frame material (eg. Wood or metal) bear the load rather than fasteners/fixings. - Current local practice to treat bamboo and wood members uses burnt engine oil or paint. - Ensure water drainage from the roofs. - *Transitional shelter*: Lightweight frame anchored to ground temporarily - The structures of transitional shelter should be demountable to allow the reinstallation of the shelter in a new (or original) location or the reuse of the materials.	
Head height	- Flat roofs height should be 9ft (2.75m) - Double pitch roofs: -60% of shelter should have min. height of 7ft (2.1m)	
Hazard	Standards	Foreseen Challenges
Heavy Rains and Floods	- Pitch Roofs: slope min 0,5% gradient. - Recommended extension of eaves: min. 6". - Raise plinth level high enough to protect the base of the wall. - For block construction use plaster on external walls to increase life span of wall.	
Earthquake	- Match design of shelter to local seismic risk. - Seismic resistance techniques to be incorporated into site selection, shelter form, the location of openings, foundations, bracing and ring beam connections - Openings weaken the structural integrity of walls – ensure load above the openings is transferred to other structural components. - Roof beam to overhang min. 6" on each side - Walls to integrate braced structure	
Fire Hazards	- Perform site planning and disseminate information on	

	appropriate safe use of fire near the shelter.	
Cyclone, Typhoon, Hurricane/ Strong Winds	- Form of shelter: rectangular or square type (ratio length to width approx. 1:1 or 1:1.5) - Secure shelter to the ground (strong foundations, lightweight frame anchored to ground) - Roof structure with adequate strength for proposed roofing material - Apply metal strapping to reinforce roof structure to withstand hurricanes, earthquakes - Sufficient pitch to withstand winds: 2-pitched roof: min. 30°- 45°, 1-pitched roof: 12°-14°	

3.5 PROTECTION, GENDER AND DISABILITY.

People of different ages and gender have varying needs following a disaster, and similarly have different capacities to fulfil those needs. For the design of recovery shelter programs, planners and designers should consult widely to ensure a gender equality approach to projects. This process starts with disaggregated data from field surveys and continues through to the monitoring of interventions as well as developing a close liaison with the Gender and Protection Cluster.

Some 20% of the Fiji population has been estimated to require, or would benefit from, planning that incorporated improved disability amenity into house design. Shelter Cluster Fiji has considered these provisions most appropriately incorporated within the BBS Guidelines.

- Recommendations for disability access to be included in core shelter designs.
- Site the house such that any steep slope is at the back, rather than at the entrance.
- Ramps instead of (or as well as) steps. Ramps should have a slope of between 1:10 and 1:12, be at least 900mm wide, have a non-slip surface and a kerb on each side.
- Handrails should be installed, at a minimum, on the ramp, porch, toilet and shower.
- All doors a minimum of 900mm wide, with a lever-type handle about 1 metre off the floor, and there should be no doorsill.
- Toilet/bathroom/shower doors should all open outwards.
- While strictly not part of shelter, but rather being bundled under infrastructure, is the topic of paving, drainage and footpaths. These are of particular concern to all disabled as soon as they leave their house. Access to and from the house to community/extended family facilities would seem to come under design considerations essential to the utility of the house. This would be particularly important in relation to access to storm shelters, and the use of facilities therein.

For further information consult “All Under One Roof” guidelines on
http://www.ifrc.org/Global/Documents/Secretariat/Shelter/All-under-one-roof_EN.pdf

3.6 SPHERE STANDARDS REFERENCE.

The Sphere Project is a voluntary initiative that brings a wide range of humanitarian agencies together around a common aim – to improve the quality of humanitarian assistance and the accountability of humanitarian actors to their constituents, donors and affected populations.

The Sphere handbook, Humanitarian Charter and minimum Standards in humanitarian Response, is one of the most widely known and internationally recognized sets of common principles and universal minimum standards in life-saving areas of humanitarian response. It includes a section on shelter, settlements and related non-food items.

For further information: http://www.sphereproject.org/handbook/

3.7 INDICATIVE LIST OF BUILDING MATERIALS AND HARDWARE SUPPLIERS IN FIJI.

R.C.Manubhai & Co LTD..PO Box 9 Ba See www.rcmanubhai.com.fj

Vinod Patel & Co. LTD See www.vinodpatel.com.fj

Carpenters Hardware 46 Matua St., Walu Bay See www.carphardware.com.fj

Kasabias LTD 75 Suva St., Suva See www.kasabias.com.fj

BlueScope Lysaght (Fiji) PL 169-71 Lakeba St., Samabula, Suva.

BlueScope Pacific Steel(Fiji)PL Leonidas St., Walu Bay

The above first four hardware and building supply companies have depots and offices in all major cities. They have delivery connections with both land and sea transport, and enabling contacts to facilitate importing, customs, VAT etc..

There are a number of local hardware stores in each Division stocking a wide range of commonly used building materials and tools.These can be located in www.yellowpages.com.fj under the headings Hardware (Retail & Wholesale), Building Materials and Timber Merchants.

3.8 FURTHER GUIDANCE & USEFUL REFERENCE DOCUMENTS (not exhaustive)

Assessments		
HHI Imagery Interpretation Guide - *Guidance on assessing wind damage to structures*	https://www.sheltercluster.org/sites/default/files/docs/harvard_hi_sat_imagery_interpretation_guide3.pdf	Harvard Humanitarian Initiative / March 2016

Fiji Shelter Cluster Cyclone Evan Assessment Form – *Template*	https://www.sheltercluster.org/sites/default/files/docs/fiji_cyclone_evan_shelter_cluster_assessment_form.docx	Shelter Cluster Fiji / Janurary 2013
Assessing Local Building Cultures - A Practical Guide for Community Based Assessment	https://www.sheltercluster.org/sites/default/files/docs/assessing_local_building_cultures_a_practical_guide_for_community_based_assessment_craterre_112015.pdf	CRAterre & partners / November 2015
Technical Guidance		
Fiji Red Cross Society – Core Shelter Technical Drawings	http://sheltercluster.org/sites/default/files/docs/frcs_-_ifrc_-_certified_construction_drawings_-_230816_-_copie.pdf	Fiji Red Cross Society / IFRC –2016
Fiji National Building Code	http://www.mit.gov.fj/images/pdf2016/fiji%20national%20building%20code.pdf	Government of Fiji / 1990
A Partial Commentary on the Fiji National Building Code - *Explanantions of the more complex provisions of the Fiji National Building Code*	http://www.mit.gov.fj/images/A_Partial_Commentary_of_the_National_Building_Code.pdf	Pacific Building Standards Project / December 1990
Fiji Home Building Manual - *Manual for the use of para-professionals and professionals for the speedy design of simple houses that conform to the National Building Code*	http://www.mit.gov.fj/images/2016/home%20building%20manual%20fiji.pdf	Government of Fiji / September 1990
Extending Impact - *Factors influencing households to adopt hazard-resistant construction practices in post-disaster settings*	http://static1.1.sqspcdn.com/static/f/752898/26141328/1429718340770/extending-impact-2015.pdf?token=3XjxTFBu8%2BF4LU2CAAVhq7NEAfs%3D	Catholic Relief Services / 2015
Managing Post-Disaster (Re)-Construction Projects - *How-to guide*	http://www.crs.org/sites/default/files/tools-research/managing-postdisaster-reconstruction-projects.pdf	Catholic Relief Services / January 2013
Technical Guidelines for Utilization of Downed Coconuts and Trees - *Typhoon Haiyan/Yolanda*	https://www.sheltercluster.org/sites/default/files/docs/technical_guidelines_for_utilization_of_downed_coconuts_and_trees.pdf	FAO / 2014
How to Work with a Chainsaw – *Guidance*	https://www.youtube.com/watch?v=Do5DfkHBhtg	Husqvarna / 18 October 2012

About Fiji and the Pacific context		
Human Settlements development and disaster risks in Pacific Island countries - Report	https://www.sheltercluster.org/sites/default/files/docs/human_settlements_development_and_disaster_risks_in_pacific_island_countries.pdf	South Pacific Programme Office of the UN Department Of Humanitarian Affairs and UN Department of Economic and Social Affairs / 1998
Traditional Coping Strategies and Disaster Response: Examples from the South Pacific Region - Report	http://www.hindawi.com/journals/jeph/2013/264503/	By Stephanie M. Fletcher, Jodi Thiessen, Anna Gero, Michele Rumsey, Natasha Kuruppu,and Juliet Willetts / 2013
Cyclone-Resistant Housing for Developing Countries - Report	https://www.sheltercluster.org/sites/default/files/docs/cyclone-resistant-housing-bre.pdf	Building Research Establishment / 1988
Fiji Shelter Risk Country Profile - Draft Report	https://www.sheltercluster.org/sites/default/files/docs/fiji_shelter_risk_country_profile_2013_draft.pdf	Shelter Cluster Fiji / 2013
Shelter Cluster Fiji Case Study - Cyclone Evan	https://www.sheltercluster.org/sites/default/files/docs/1260500-fiji_shelter_cluster_case_study-en-lr02_tl.pdf	Shelter Cluster Fiji / 2012
Housing, Land and Property Rights		
Key Housing, Land and Property (HLP) Principles for Shelter Partners - Guidance note	http://sheltercluster.org/sites/default/files/docs/overview_-_key_hlp_principles.docx	Global Shelter Cluster
Shelter & Construction Guidelines		
The Sphere Handbook: Humanitarian Charter and Minimum Standards in Humanitarian Response - Guidelines	http://www.sphereproject.org	Sphere Project / 2011
Plastic Sheeting guide - Guidelines	https://www.sheltercluster.org/sites/default/files/docs/Plastic%20Sheeting%202007_0.pdf	IFRC - Oxfam / 2007

Owner-Driven Housing Reconstruction guidelines -Guidelines	https://www.sheltercluster.org/sites/default/files/docs/ODHR%20Guidelines.pdf	IFRC / 2010
Shelter Safety Handbook: Some Important Information on How To Build Safer - Handbook	http://www.ifrc.org/PageFiles/95526/publications/305400-Shelter%20safety%20handbook-EN-LR.pdf	IFRC / 2011
Assisting Host Families and Communities after Crises and Natural Disaster - A Step-by-Step Guide - Guidelines	http://ifrc.org/PageFiles/95186/IFRC%20DRC%20Assisting%20host%20family%20guidelines-EN-LR.pdf	IFRC / 2012
Participatory Approach to Safe Shelter Awareness		
Participatory Approach to Safe Shelter Awareness (PASSA) – Guidelines	http://www.ifrc.org/PageFiles/95526/publications/305400-PASSA%20manual-EN-LR.pdf	IFRC / 2011
Introductory Video about PASSA - Youtube video	https://www.youtube.com/watch?v=f6B-aFNT388	IFRC / 2011
Gender, Protection & Inclusion		
IASC Gender Handbook - Gender and shelter in emergencies - Handbook	http://www.ungei.org/resources/files/12.pdf	IASC
Tip Sheet: Addressing Gender-based Violence (GBV)-related Risks in WASH Assessments and Initial Programme Design. Global Protection Cluster, GBV Prevention & Response - Guidance note	http://www.humanitarianresponse.info/operations/philippines/document/tip-sheet-addressing-gender-based-violence-gbv-related-risks-wash	Global Protection Cluster / 18 Nov 2013
Guidance on Including Older People in Emergency Shelter Programmes, (2011) - Guidelines	http://www.helpage.org/download/4d7f5a8b98378	HelpAge International IFRC / 2011
Disability Checklist for Emergency Response: Adapted from Disability Task Force - Checklist	http://www.handicap-international.de/fileadmin/redaktion/pdf/disability_checklist_booklet_01.pdf	Handicap International
CARE International Rapid Gender Analysis - Tropical Cyclone Winston, Fiji - Report	https://www.sheltercluster.org/sites/default/files/docs/ll-care_tcwinston_rapidgenderanalysis.pdf	Care International / March 2016
Checklist for Protection Mainstreaming in Shelter - Checklist	http://sheltercluster.org/sites/default/files/docs/checklist_for_protection_mainstreaming_in_shelter.docx	Global Shelter Cluster

Gender equality in Shelter & NFI Interventions - Checklist	http://sheltercluster.org/sites/default/files/docs/gender_equality_in_shelter_nfi_interventions.pdf	IASC Gender Marker September / 2012
Protection Checklist - TC Winston	https://www.sheltercluster.org/sites/default/files/docs/protection_checklist_-_revised_for_tc_winston_final.pdf	Safety & Protection Cluster Fiji / February 2016
Gender and Shelter - Guidance on integrating gender into shelter programs	http://www.redcross.org.au/files/2011Gender_and_Shelter.pdf	Australian Red Cross / 2011
Gender in Shelter Activities in TC Winston - Quick Tips	https://www.sheltercluster.org/sites/default/files/docs/gender_in_shelter_activities_in_tc_winston_-_quick_tips_v2.pdf	IASC GenCap & Safety & Protection Cluster / march 2016
Environment		
The State of Asbestos in the Pacific - *Analytical Report*	https://www.sheltercluster.org/sites/default/files/docs/the_state_of_asbestos_in_the_pacific.pdf	SPREP
National Guidelines for Disaster Waste Management in Fiji - Asbestos	https://www.sheltercluster.org/sites/default/files/docs/extract_fiji_national_guidelines_on_disaster_waste_management_asbestos.pdf	SPREP
Asbestos in Emergencies - *Simple and practical guide for transitional settlement and reconstruction practitioners*	https://www.sheltercluster.org/sites/default/files/docs/asbestos_in_emergencies.pdf	Shelter Centre & ProAct Network / 03 March 2010
Copper-Chrome-Arsenic (CCA) Treated Timber - *Guidance*	https://www.sheltercluster.org/sites/default/files/docs/copper-chrome-arsenic-cca-treated-timber.pdf	Better Health Channel / Government of Australia
Environmental Resources for Shelter Cluster Fiji - *Index*	https://www.sheltercluster.org/sites/default/files/docs/shelter_resources_for_fiji_march_2016.pdf	WWF / March 2016
Cyclone Winston - Fiji Environmental Issues - *Report*	https://www.sheltercluster.org/sites/default/files/docs/2016.03.02_cyclone_winston_-_fiji_environmental_issues.pdf	WWF / March 2016
Fiji Forest Harvesting Code of Practice	https://www.sheltercluster.org/sites/default/files/docs/government_of_fiji.pdf	Government of Fiji / 2008
Accessibility		

Disability inclusive shelter key messages - Technical Guidance	http://sheltercluster.org/sites/default/files/docs/disability_inclusive_shelter_key_messages.docx	Protection Cluster / 27 April 2015
Inclusive post-disaster reconstruction: Building back safe and accessible for all - 16 minimum requirements for building accessible shelters - Guidelines	http://sheltercluster.org/sites/default/files/docs/16-minimum-requirements-for-building-accessible-shelters_0.pdf	CBM
All Under One Roof: Disability-inclusive shelter and settlements in emergencies - Guidelines	http://sheltercluster.org/sites/default/files/docs/all_under_one_roof_-_disability-inclusive_shelter_and_settlements_in_emergencies.pdf	IFRC, Handicap International & CBM / 2015
Fiji Disabled Peoples Federation - Shelter Disability Assessment	https://www.sheltercluster.org/sites/default/files/docs/fji_3w_snapshot_shelter_cluster_1600505.pdf	Fiji Disabled Peoples Federation / 28 April 2016
Guidelines for Physical Accessibility for Shelters - Physical design aspects that support shelter accessibility	http://www.pacificdisability.org/getattachment/Resources/PDF-Resources/Guidlines-on-Physical-Accessibility-for-Shelters.pdf.aspx	Pacific Disabillity Forum / September 2013
WASH	Link to document	Source / Date
Sanitation in Emergencies - Guidance	https://www.sheltercluster.org/sites/default/files/docs/emergency_sanitation_materials.pdf	WASH Cluster Fiji / 2016
Fiji National WASH Cluster Guidelines for Emergency Sanitation	https://www.sheltercluster.org/sites/default/files/docs/fiji_national_wash_cluster_guidelines_for_emergency_sanitation_16th_march.pdf	WASH Cluster Fiji / 16 March 2016
Fiji National Building Code - Latrines	https://www.sheltercluster.org/sites/default/files/docs/building_code_latrines.pdf	Government of Fiji
Fiji National Building Code - Rain Water Harvesting	https://www.sheltercluster.org/sites/default/files/docs/rain_water_harvesting_building_code.pdf	Government of Fiji