

Fiji IAP SIGUS Workshop on Incremental Housing

**INCENTIVIZING ENVIRONMENTALLY RESILIENT BEHAVIOR
AT THE INDIVIDUAL LEVEL
THROUGH NATIONAL INCREMENTAL HOUSING POLICY**

Kelly Heber



INTRODUCTORY REFLECTIONS

Over MIT's Independent Activities Period in January 2013, MIT's SIGUS Group in the Department of Architecture and Planning under the leadership of Professor Reinhard Goethert organized fieldwork in Suva, Fiji. My role was as an environmental policy analyst, with funding through my department. Immediately upon landing in Fiji it became clear that the Fiji of guidebooks is starkly different than the area in which we would conduct key informant interviews for a two-week period.

Suva is a polluted, congested, yet manageably small city on a peninsula on the east coast of the main island of Fiji, *Viti Levu*. On my first day I was able to visit every major site listed in the guidebook, which bills Suva as a place where one would go in order to escape from resorts, and "rub shoulders" with locals. To me, this was travel book code for "a polluted industrial city that tourism officials would probably prefer Westerners not to see." But there is a lot more to Fiji's story that seems to be swept under the rug when Westerners come to the island for luxe honeymoons or for beer-fueled backpacking gap years. There are no white sandy beaches in the coastal strip surrounding Suva, only highly polluted and silty mudflats that are exposed twice daily with the tides. A coastal mangrove barrier is highly fragmented but for the most part, non-existent since Suva is Fiji's major port for both import-export trade as well as for the docking of cruise ships. This was a remarkable absence for an island nation threatened by intense tropical cyclones and inevitable sea level changes.

Beyond these environmental observations, impressions on the socio-economic well-being of residents began to suggest that the idealized island life for average Fijians is somewhat of a cruel myth. In every grocery store that I visited, sugary drinks and processed snacks were cheaper and more readily available than water or fresh foods. There seemed to be an element of mistrust between the two major ethnic groups on the islands, as one of the first things I was told by a cab driver of Indo-Fijian descent was that Fijian drivers tend to be more honest than Indo-Fijian ones like him! All of these small observations began adding up over the course of my stay, and really started to gel in place on the day that we visited the now defunct parliament, which lies dormant following the military coup of 2006. Many of these first impressions on how the native Fijian population lived solidified over the course of our fieldwork.

Brief as our stay was, I base the following paper on a series of rich yet impressionistic interviews and observations gained through field work that spanned locations ranging from the slums of urban Suva, to the rural farming areas further inland, to the fish markets in the heart of the port. My role on

the trip as an environmental analyst informs my assessment of the barriers Fiji faces to proper land use planning in urban settlements, as well as bridges to these barriers in an incremental housing scheme with environmentally resilient components. This account begins with a brief review of current scholarship covering small island developing states, their political economy, and sustainable development policies the impact the environment. Then, I discuss my data and analyze it in an impressionistic way to describe hypothetical policies that could link incremental housing strategies and environmentally resilient behavior.

POLITICAL ECONOMY OF FIJI: PROBLEMS WITH CLOSE SECTORAL PROXIMITY AND ECONOMIES OF SCALE

Small Island Developing States (SIDS) such as Fiji are among the most vulnerable states in the world (Strachan and Vigilance 2011). Aspects of their vulnerability include their small land mass which results in intense competition over natural resources, a closer-than-usual proximity between varying economic sectors, an inability to achieve economies of scale due to its domestic manufacturing markets, and an increased exposure to extreme weather events.

In the case of Fiji, domestically manufactured items were incredibly hard to come by in local shops because of the shortage of domestic manufacturing stemming from a lack of opportunities to grow and ultimately create economies of scale. The government encouraged consumption of domestically produced items such as powdered milk and sugar, but this ad campaign, visible on a limited number of billboards, seemed to suggest more was domestically manufactured than the reality of simple trips to the supermarket would suggest.

The extremely close links of various economic sectors in Fiji is best illustrated through the effects of development on Fiji's primary economic engine: its coastal resources. Coastal zones are the most densely populated regions of Fiji, and marine ecosystems (beaches, coral reefs) attract millions of dollars in tourist revenue annually. In addition, Fiji and other SIDS have large EEZ's, or ocean zones where Fijian fishers or contracted parties have exclusive rights to collect fish and other harvestable marine resources. Large EEZ's mean that offshore fisheries constitute the second largest chunk of GDP behind tourism (Lal 1990). Output from activities in wide ranging economic sectors ultimately degrades the same environmental resource. To illustrate the point, bad farming practices, construction efforts with hazardous runoff, export-oriented shipping, and hotel effluent are drivers of environmental change with different sectoral starting points, but only one end point: the surrounding marine ecosystem. Be it

not for this ecosystem, Fiji would suffer damages of \$500 million FJD annually in lost tourism revenues in addition to the 40,000 jobs tied to tourism (Narayan 2004).

FEATURES OF AN APPROACH TO POLICY DESIGN UNDER A NATIONAL SUSTAINABLE DEVELOPMENT STRATEGY

International and regional institutions have identified these challenges, and planned coordinated efforts to try and solve them. In order to solve the problem that limited space creates on the Fijian economy and economies of other SIDS, the United Nations through its 1992 Earth Summit called upon these states to adopt a national sustainable development strategy (NSDS). Sustainable development is broadly defined as the stage where a country's economic development occurs at a rate that does not lessen the quality of life of future generations. When a state uses a NSDS approach to crafting policy, it incorporates a few rules across the board into the policy-making process. These rules include the following principles: government is not exclusively responsible for sustainable development, society shares some of the burden; development must be participatory with all interested stakeholders helping to design and implement policy; planning and management has to happen across different sectors (for example, the Ministry of Environment and the Ministry of Forestry); there needs to be a shift from a process that favors projects to a process that puts systems in place at the national scale; and government agencies and policy actors must adapt when policies fail. In other words, every policy designed by government follows these rules in order to fall in line with the NSDS. A follow-up conference, the 1994 Global Conference on the Sustainable Development of SIDS, recognized the uniquely keen vulnerabilities of these island nations, and set up a framework for implementing NSDS' into policy design. Following these meetings and agreements, Fiji is currently incorporating the rules set forth in the NSDS into its policy-making process. Every Ministry we visited reminded people of this process with banners, posters, and stickers saying that this was an ongoing process.

Hirano observes that Fiji's inclusion of NSDS principles in government's policy making is standard practice (2008). This observation is partially supported by my interviews with policy-makers and practitioners in the Ministry of Environment and the Ministry of Foreign Affairs. There is however a noticeable capacity gap in practitioners at high levels, some of whom were unable to outline specific strategies taken by Fiji to implement policies regarding a range of things, from adaptation to climate change to requiring environmental impact assessments. The problem seemed to be traced to dispersed financial instruments to fund initiatives, with pockets of money spread around ministries to accomplish the same thing. This keeps with the spirit of the NSDS feature relating to cross-sectoral planning and

management. In reality though, many stalled projects or fragmented projects lay in the wake of such decisions. For instance, several different ministries including Agriculture, Forestry, International Affairs (which oversees climate change matters) and Housing all had programs designed to enhance conservation of mangroves.

In line with NSDS rules described above, a frequently touted governmental program in Fijian ministries is to foster local participation in the planning and implementation of environmental policies. Since environmental policies are closely linked to development issues, these will be discussed in depth in the following pages. Participatory planning involves government consultation of local stakeholders, local private businesses, and local civil society groups. Once needs are outlined, policies are designed and implemented via networks of these actors. Clarification is needed on formal Fijian government protocol regarding stakeholder selection methodology. Who can act as a stakeholder? How can long-term relationships between interested stakeholders and government be strengthened? Who is responsible for implementing policy once it has been designed, and how are they held accountable?

I feel that these questions gleaned through exploratory research can begin to address a major problem with participatory policy design, and NDS principles as well, in the Fijian context: how can Fijian ministries and their partners move from fragmented capacity to implement sustainable development policy to a more systematic, national-scaled approach to implementation? Research suggests the answers to this question can be traced back to recurring problems such as civil society lacking the capacity to have an ongoing dialogue with government, inefficient resource allocation, and the challenges associated with involving a wider range of stakeholders. It seems that in Fiji's case, involving more NGOs in the budget allocation processes of various ministries may be a solid first step to reduction of fragmentation. An example from my experience in Fiji involves afforestation of mangroves which is happening in a few locations by a few different NGO's as either offsetting projects offered to tourists or as climate change mitigation projects for villagers. If these NGOs were incorporated as part of a networked national strategy to afforest mangroves, by delegating a ministerial responsibility to them through budgeting and performance measures, perhaps fragmented efforts could begin scaling up.

Another frequently cited barrier to implementing sustainable development policy rests in the challenges presented by various institutions with overlapping mandates, roles, and responsibilities. When institutional arrangements are confusing even to those who work within government, some type of reorganizing is probably necessary when seeking to reduce fragmented policy implementation efforts. This need for reorganization harks back to the NSDS principle of "adaptive-ness."

My interviews with professionals in the Ministries of Housing Urban Development and Environment, officials at the US Embassy, the Ministry of Foreign Affairs, and the Environment Department, led me to the conclusion that trying to trace roles, policies, and responsibilities for a single issue: afforestation for climate change adaptation was extremely challenging for me as a researcher, and the respondents in the interviews as well. Governance, or the power points of decision-making and policy implementation, takes the shape of a complex network in many countries both developed and developing, so complexity is not surprising (Jones et al. 1997). Multiple ministries working on sustainable development programs is a necessary institutional arrangement given the cross-disciplinary planning and coordination recommended by NSDS principles. However, in the case of Fiji, interviews suggested the current arrangement lead to backlog, stalled implementation of critical policy, and confusion over who is doing what. This may be a problem best solved by Fiji's National Council on Sustainable Development, designed to support the implementation of relevant policy, and coordinate between implementing agencies. However, Research shows that this institution suffers a major lack of funding and capacity to act (Hirano 2008).

DATA COLLECTED

Over a two week period working on a team, I conducted 12 in depth semi structured interviews to construct a descriptive case to answer the following question: How can incremental housing policy incentivize behavior change at the individual level that leads to environmentally resilient outcomes? Five environmental concerns emerged among respondents that could be used as tools to design housing policy to incentivize certain behaviors. They are outlined in the table below:

Environmental characteristics of households in squatters' settlements	Number of respondents (out of 12) who expressed this sentiment
Expressed desire to shed the cost of utilities	12
Expressed a strong concern of natural disasters including flooding and cyclones	8
Held a desire for formal and dependable access to electricity (because their current access was severely constricted or non-existent)	3
Currently uses pirated utilities either water, power or both	8
Lacked a guttering system on their home to control storm water runoff	10

Preceding the interviews with the squatters, I then interviewed several senior officials in the ministries affiliated with environmental policy design. Their responses were combined with the interviews of squatters in order to come up with the following ideas for strengthening the environmental resilience of informal Fijian settlements as they transition to formal settlements. The vehicle for incentivizing environmentally sound behavior change at the individual level could be a coupling of incentives with a housing policy that views incrementalized building as legitimate.

Since Suva and urban areas in Fiji in general are facing a housing shortage, and not a land shortage, combined with the fact that building skills are widespread among squatting communities, incremental housing policy that legitimizes current squatters and allows them tenure rights is the first step to inducing environmentally resilient behavior change. The legal legitimacy will allow them some form of equity to make small loans to pay upfront costs of certain environmental investments on their homes. The table below outlines suggested routes to incentivize environmentally resilient behavior, and its justification through my interview data.

<i>Suggested policy</i>	<i>Justification</i>	<i>Financing mechanism</i>
Solar panels required on all new homes and retrofitted onto all old homes over ten year period	The desire to save on power bills was universal, solar panels can pay for themselves over a three and a half year period as outlined in the section below with ratepayers paying utility bills as normal	Subsidy could be financed through the GEF or through climate change NGOs or as a CDM offsetting project
Payment for environmental services (PES) scheme related to land owners with at least 9m ² of green space for biodiverse floral plots	Nearly every household had some type of significant green space surrounding their property. In a PES scheme, a technique gaining serious traction and attention in multilateral institutions, homeowners could be paid rents to maintain a biodiverse lot. This rent need not be in case, but perhaps in vouchers to contribute to payments for solar panels or rain catchment devices.	GEF as it is tied to the Convention on Biological Diversity
Mandatory guttering systems that trap storm water runoff in cisterns and retrofitting old households over a ten year period	Even on squatters' communities build on steep hills and along small ravines, there was a significant absence of an effective water management system to mitigate the effects of extreme weather.	Disaster relief funds from TC Evan, 50-50 cost share with government subsidy and private payments from homeowners to replace their monthly water bill
National, systematic effort to afforest mangroves with a simultaneous no-net-loss program coupled with a plan to outsource labor to villages	Many different government agencies were simultaneously working to conserve mangroves as a way to mitigate effects of intense weather events. These efforts were fragmented and poorly coordinated. It seems like NGOs have seen pilot success stories, and could be valuable partners if invited into an official role in government budgeting processes.	CDM projects

IN DEPTH BREAKDOWN OF SUGGESTED POLICIES

I. Energy efficiency

Housing policy that legitimized incremental building within reasonable constraints can couple with environmental initiatives that benefit homeowners by reducing their utility costs, while providing the social good of climate change mitigation. Climate change mitigation is a mainstream policy goal of the Fijian government. Energy efficiency is a major component of this effort. It is not hard to see how a national requirement for new homes to have solar panels, coupled with a subsidy that splits the upfront cost with homeowners could incentivize environmental behavior (though private gains) by way of eliminated utility bills. Complete units in Fiji sell for \$2500 FJD. If government were to subsidize a 50-50 cost share, and residents were to pay fees that matched what they once paid for utilities (\$30 FJD/month) a homeowner could pay their share in 3.5 years.

II. Ecosystem-Based Management

Ecosystem-based management or EBM is a principle in Fiji's NSDS. It is defined by the Ecological society of America as a management system utilizing adaptive techniques to achieve measurable ecological targets. In an adaptively managed ecosystem, managers recognize up front that uncertainty over how an ecosystem will behave under various conditions will always be present. This is different from traditional ideas on management that assume the behaviors of an ecosystem can be predicted through a highly complex simulation model. Managers use models in adaptive management, but only as a loose guide up front to help them design treatments to administer to an ecosystem. A treatment could include anything physically added or removed from an ecosystem, such as a settlement, or artificial wetlands built at the fringes to mitigate pollution. These treatments are monitored through time and treated as hypotheses for desired ecosystem responses, and if responses prove undesirable, treatments are changed (hence the word "adaptive"). Besides adaptive management, EBM acknowledges up front that humans are a part of the ecosystem being managed, and not merely drivers of ecological destruction.

In terms of a national strategy to manage Fiji's terrestrial and ecological ecosystems, EBM serves as a "good fit" since it meets all of the above principles of a NSDS approach to policy design. In terms of our exploratory fieldwork, many of the slums or "informal settlements," where squatters built their homes around Suva were filled with large, connected webs of green space containing highly diverse

species of plant life. Biodiversity, or the number of different living species in a given ecosystem, has major implications for mitigating the adverse effects of climate change. These are extensively discussed in the relevant literature (see also *ibid* Glowka et al. 1994, Heywood 1995, Meyers 2000, Ehrenfeld 1988, Sala et al. 2000, and Loreau 2002). For the sake of making this account practical, I will describe what biodiverse floral green space, as seen in informal settlements in Fiji, can do for the residents of such areas around Suva. In the squatters' settlements, nearly every home was surrounded by a minimum of nine square meters of greenspace, with ad hoc estimates at between 5-7 separate plant species in such a space. Homeowners, in the event of a sudden temperature change, will experience a less dramatic die-off than would a similar homeowner with a less biodiverse lot. This resilience of surrounding flora is useful to prevent erosion and flash flooding in the event of extreme weather, as such plant species with roots of varying depth anchor soil (and housing settlements that rest on soil) in place.

Homeowners can be incentivized by government to maintain biodiverse lots. This "payment for environmental services" scheme can pay residents, not necessarily in cash payments, for maintaining a lot with a pre-decided amount of biodiversity. Given that many squatters have this already, this is money in their pockets tied to environmentally resilient stewardship of their lot. Some respondents suggested problems with the way certain residents disposed of waste recklessly, PES may also stem this behavior. Funding for a PES system could be tied to the Clean Development Mechanism which pays for projects in the developing world to offset emissions of industrial producers in the developed world.

III. Addressing storm *water runoff with rain catchment planning*

One remarkable absence in squatters' settlements was the near universal lack of gutters on informal houses. In a hypothetical settlement with 60 houses, built on a hillside with some plant cover, the prospects for most homes being washed away in a major weather event are large. If these same houses included a cheap and easy to install guttering system which then ran water into a rain catchment barrel, some of these problems could be addressed. In legitimizing informal housing strategies, government can cost share a gutter/cistern unit, requiring it on every new home built in policy, and retrofitting existing homes over a ten year implementation period. Funds could come from the millions of dollars granted to Fiji from disaster relief funds. Additionally, this addresses the willingness of all informants to shed utility costs, providing an incentive for environmentally sound behavior change.

IV. *Mangrove restoration*

Fiji is witnessing significant action on the mangrove conservation front, though respondents suggested that this area and other environmental policy issues faced a problem of “pilot project syndrome.” This means that most efforts are stuck in a piloting phase where they are spread out, small in scale, and not done as part of a national or systematic plan. Perhaps Fiji may benefit from a “no-net-loss” policy on mangroves, with funding sources through RAMSAR. In addition, tangled networks of governance can be better organized to parse out who is responsible for mangrove issues. In addition, success stories from NGOs serve as a possible route to include them in ministerial budgeting rounds in order to implement conservation policy that the ministry may simply lack capacity to do.

WORKS CITED

Hirano, Saki. "The Development of National Sustainable Development Strategies in Small Island Developing States." *Sustainable Development in Small Island Developing States: Issues and Challenges* 80 (2008): 4.

Jones, Candace, William S. Hesterly, and Stephen P. Borgatti. "A General Theory of Network Governance: Exchange Conditions and Social Mechanisms." *Academy of management review* 22.4 (1997): 911-945.

Lal, Padma Narsey. *Conservation or conversion of mangroves in Fiji: an ecological economic analysis*. 1990.

Narayan, Paresh Kumar. "Economic impact of tourism on Fiji's economy: empirical evidence from the computable general equilibrium model." *Tourism Economics* 10.4 (2004): 419-433.

Strachan, Janet, and Constance Vigilance. *Integrating Sustainable Development into National Frameworks: Policy Approaches for Key Sectors in Small States*. Commonwealth Secretariat, 2011.