

CORAL REEF MINING AND COASTAL RISKS IN PACIFIC SMALL ISLAND DEVELOPING STATES (SIDS)

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Large-scale weather and oceanographic processes continually affect Pacific Small Island Developing States (SIDS). These cause modification of shorelines and loss of valuable land. In addition, infrastructure and property damage, loss of lives and loss of investment also result. In SIDS where financial capital and natural resources may not be easily available, these impacts create genuine concerns and are of paramount importance for developing island economies. Human occupation of narrow coastal fringes on small atoll islands also make coastal communities more vulnerable to coastal erosion hazard, increasing the specific risks to communities. Risks to coastal communities in Pacific SIDS are directly related to natural coastal hazards, but are exacerbated by human development of coastal fringes. In particular, is reef aggregate mining. These cause deterioration of reef ecosystems, decrease in carbonate sediment production, loss of natural shoreline protection and increase in coastal erosion. Carbonate sediments mined from reefs are used for engineering construction, including pavements, backfill, rubble structures, concrete/mortar, retaining walls, piles and houses. These aggregate are of low density and compressive strength, contain harmful chloride and sulphate ions and are of low abrasive resistance. These properties render them of low quality, with an engineering design life much shorter than terrestrial crushed rock aggregates. Much of this material bonds poorly in concrete, are porous, deteriorate concrete-aggregate admixtures, causing strength loss and can easily crumble during large magnitude seismic events, common in the Southwest Pacific. Consequently, their use in construction also creates building hazards and construction risks to communities.