5th Meeting of the Expert Group on Disaster-related Statistics in Asia and the Pacific

20 – 22 September, Incheon, Korea

Session 3: Using census data for developing community-based hazard exposure statistics for Pacific Island States
What is SPC?

- Pacific Community (SPC) - Principal scientific and technical organization in the Pacific region, proudly supporting development since 1947. Owned and governed by 26 country and territory members of which 22 receive support. - www.spc.int

- SPC’s Statistics for Development Division (SDD) aims to strengthen the capacity of national statistical systems and social and economic planning agencies to provide policy-makers and analysts with important demographic, economic and social indicators for planning and decision making - http://sdd.spc.int

- SPC’s Geoscience Division (GSD) is the region’s principal provider of geoscientific services, in work areas such as Ocean and Coastal Geoscience, Disaster Risk Reduction, Climate Change, Water and Sanitation, Natural Resource Economics, Geothermal Energy, Geological Resources and Surveys etc. http://gsd.spc.int/
Overview

• Real-time access to data is key – Cyclone Winston population projections

• Providing access to population statistics (Statistics for Dev. Division)
  – PopGIS mapping application to disseminate population datasets and to assist during disaster event
  – SDMX Open data portal
  – Table Joining Service (TJS)
  – Coastal mapping

• Preparedness/planning + disaster management (Geoscience Division)
  – PacGEO
  – PCRAFI
  – Riskscape
  – PacSafe
CYCLONE WINSTON POTENTIAL IMPACTED POPULATION - 23/02/16

NOTE: Population figures projected to 2015 using age distribution from 2007
Population and Housing Census then prorated to match total projected population

Legend
- Intensity
- Cyclone track
- 0-30km: Likely to be severely to extremely affected
- 30-40km: Likely to be seriously to severely affected
- 40-50km: Likely to be moderately to seriously affected
- 50-100km: Likely to be somewhat to moderately affected
- Fiji EAs

<table>
<thead>
<tr>
<th></th>
<th>0-30km</th>
<th>30-40km</th>
<th>40-50km</th>
<th>50-50km</th>
<th>50-100km</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>208070</td>
<td>50662</td>
<td>88996</td>
<td>496281</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>106875</td>
<td>26530</td>
<td>45481</td>
<td>250770</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>101195</td>
<td>24132</td>
<td>43515</td>
<td>245511</td>
<td></td>
</tr>
<tr>
<td>Children under 18</td>
<td>70218</td>
<td>18691</td>
<td>31244</td>
<td>169737</td>
<td></td>
</tr>
<tr>
<td>Children under 5</td>
<td>20887</td>
<td>5642</td>
<td>9685</td>
<td>51174</td>
<td></td>
</tr>
<tr>
<td>Children under 1</td>
<td>2103</td>
<td>565</td>
<td>975</td>
<td>5153</td>
<td></td>
</tr>
<tr>
<td>Pregnant and lactating mothers</td>
<td>4550</td>
<td>1108</td>
<td>1946</td>
<td>10854</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: EAs which were split by a buffer zone have their populations apportioned to each buffer.

Map produced by Phil Bright (philb@spc.int), Statistics for Development Division, SPC, 23-02-16
Census/HIES indicators?

- Population counts/location (many countries now use GPS for HH locations), breakdown by age/sex
- Educational status – highest qualification, current attendance
- Health status – height, weight, ongoing illnesses
- Communication status – access to internet, mobile phone ownership
- Household consumption/expenditure
- Poverty/income data
- Household characteristics – construction material, sanitation, energy, water access/use
- And more...
PopGIS

- Simple data visualization/analysis tool
- Various levels of geography from Enumeration Areas to Provinces
- 13 countries + 1 regional SDG/core indicator database (migrating to SDGs)
NMDI Database

• National Minimum Development Indicators
• 7 themes:
  – Population and development,
  – Human development,
  – Agriculture and forestry,
  – Public health,
  – Communication and infrastructure,
  – Fisheries and aquaculture,
  – MDGs
• http://www.spc.int/nmdi
SDMX Portal

- Maintenance, storage, dissemination of data + structural metadata
- SDMX (Statistical Data and Metadata eXchange) standard
- Machine-to-machine readable
- Downloadable in many formats
Table Joining Service

- PopGIS-> QGIS plugin: [https://github.com/sopac/popgis-plugin](https://github.com/sopac/popgis-plugin)

- Future => TJS over SDMX to create web map services
Coastal mapping

- Determine populations within 1km, 5km and 10km of the coast for all Pacific Island Countries and Territories
- Big demand for food security + disaster preparedness/management

[Map Image]

- [https://pacstats.maps.arcgis.com/apps/MapJournal/index.html?appid=2b5cad0e20e642de96db85b377fc128c](https://pacstats.maps.arcgis.com/apps/MapJournal/index.html?appid=2b5cad0e20e642de96db85b377fc128c)
- Some countries have HH-level GPS – ideal scenario, no modelling needed
- Landscan 2015 / SEDAC-CIESIN GPWv4 used as proxies when no GPS
- Waiting for release of new Worldpop dataset – multi-temporal 2000-2020 global 100m resolution datasets based on multiple variables. ([https://www.nature.com/articles/sdata20171](https://www.nature.com/articles/sdata20171))
Hazard Prep/Assessment

- Multiple available tools which can be used for evidence-based natural hazards risk assessment.
  - Baseline data:
    - PacGeo
    - PCRAFI => PacRIS
  - Disaster info/reporting:
    - PDN
    - PDaLo
    - PDNA
  - Risk assessment tools:
    - RiskScape + PacSafe
PacGEO

An open access geospatial data repository for the Pacific Region providing premier geophysical, geodetic, and marine spatial data sets.

Developed through collaboration between the GeoScience Division of Secretariat of the Pacific Community (GSD/SPC), University of Sydney, Geoscience Australia (GA), and GRID-Arendal.

- Deployed in 2013
- Cloud-based
- 900~ layers
- 950~ related documents
- 40~ Users across PICs trained

www.pacgeo.org
PacRIS

- Pacific Risk Information System
- Products of PCRAFI Phase 1
- Derived from largest field surveys taken in the Pacific
- Inputs for vulnerability assessment:
  - Sat imagery, admin boundaries, pop. censuses, agriculture, infrastructure
- Inputs for hazard assessment:
  - Topo. maps, surface soil, bathy., geodetic + fault data, surface geology
- Datasets being updated
- [http://pcrafi.spc.int/](http://pcrafi.spc.int/)
<table>
<thead>
<tr>
<th>?</th>
<th>PDN</th>
<th>PDaLo</th>
<th>PCRAFI</th>
<th>PDNA</th>
</tr>
</thead>
</table>
| Which data is hosted | • Alerts  
• Documents - Situation reports, newspaper articles, assessments etc. – new and history  
• Link to PDaLo  
• Contacts  
• Calendar | • Damage and loss data - validated and quality controlled | • Historical Hazard and Loss Database  
• Probabilistic Hazard Models  
• Geo-referenced Exposure Database  
• Catastrophe Risk Models and Profiles | • Methodology  
• Values - damage, loss, macroeconomic impact  
• Data stored in PDaLo |
| Volume | +11,000 Documents  
+750 Contacts  
+750 Calendar | Total – 1176  
Conseq – 600  
PDN – 564  
New – 12 | ~100 GB  
Spatial and tabular data  
Reports | Reports  
Data - restricted |
| How can the information be accessed | [www.pacificdisaster.net](http://www.pacificdisaster.net) | [www.pdalo.net](http://www.pdalo.net) | pcrafi.spc.int | Reports stored in Pacific Disaster Net |
| Who prepares information and knowledge to support decision making | Pacific Disaster Net Team  
National technical agencies Partners | Government PDNA Sector experts | Government PDNA Sector experts |
Efforts undertaken to align currently active risk tool development projects:

- PARTneR (RiskScape) + PACSAFE
<table>
<thead>
<tr>
<th>PARTneR vs PacSAFE</th>
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<tbody>
<tr>
<td><strong>RiskScape</strong></td>
</tr>
<tr>
<td><strong>Hazards</strong></td>
</tr>
<tr>
<td>✓ Earthquakes</td>
</tr>
<tr>
<td>✓ River flooding</td>
</tr>
<tr>
<td>✓ Coastal flooding</td>
</tr>
<tr>
<td>✓ Tsunami</td>
</tr>
<tr>
<td>✓ Volcanic ash fall</td>
</tr>
<tr>
<td>✓ Cyclone winds</td>
</tr>
<tr>
<td>✓ Hazard footprints</td>
</tr>
<tr>
<td><strong>Tool outputs</strong></td>
</tr>
<tr>
<td>✓ Economic loss</td>
</tr>
<tr>
<td>✓ Infrastructure and building damage levels and loss</td>
</tr>
<tr>
<td>✓ Population affected, killed or injured</td>
</tr>
<tr>
<td>✓ Exposure</td>
</tr>
<tr>
<td><strong>Primary Users</strong></td>
</tr>
<tr>
<td>National Disaster Management Offices Planning Agencies Infrastructure providers Researchers</td>
</tr>
<tr>
<td><strong>Initial country partners</strong></td>
</tr>
<tr>
<td>Samoa, Vanuatu</td>
</tr>
</tbody>
</table>
PARTneR project

Hazard types:
- Flood
- Landslide
- Wind
- Storm surge/tide
- Tsunami
- Earthquake
- Snowfall
- Volcano etc

Key Outputs:
- Asset exposures
- Damage states
- Reinstatement costs
- Human losses
- Human displacement
- Exported as .csv or .kml

RiskScape framework