

# Pacific Wellbeing Survey – Vanuatu Project – third step

This short paper follows the work done with Juan Munos during his stay in SPC from the 5<sup>th</sup> to the 12<sup>th</sup> of November:

- The sampling strategy
- The budget related
- The selection of households
- The sample
- The sample planning and the team workload

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## Overview

The survey collection will be spread over a one year period, split in 24 rounds. One round is a 2 weeks period, time required for one team of enumerators to survey 12 households. One team is composed by a supervisor, in charge of quality of the data collected and the data entry and 2 enumerators, in charge of 6 households each. The data entry will be operated by the supervisor during the time of the round, when a new round starts, the data entry of the previous one is completed.

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## 1. Sampling Strategy

From the census household listing and the GPS location of the dwelling, 5 categories of household are created:

- a. **CATEGORY 1 : Urban area** (Luganville and Port Vila) – *no per diem, no air fare*

According to the census boundaries (downtown transport every day to pay)

- a. Province 2 - Sanma : urban area Luganville – island of Santo
- b. Province 5 - Shefa : urban area Port Vila – island of Efate

- b. **CATEGORY 2: Peri urban area** (Luganville and Port Vila) – *no per diem no air fare*

Creation of a “peri urban area”, all the people living out of the cities but as closed that they can easily access all the services, job opportunities...

- a. Province 2 - Sanma : Luganville peri urban (EA list in appendix 1) – island of Santo
  - a. North – EAs 418, 419, 420, 421 (Suranda, road to Hog Harbor),
  - b. West – EAs 463, 464, 465 (coast road to /past tangoa),
- b. Province 5 - Shefa : Efate, Port-Vila peri urban
  - a. West – Mele Maat (snake hill road), Eas 711, 712, 713, 714
  - b. East – Teouma River, EAs 715, 716, 717, 718,

NB: Malo and Aore in Sanma province do not belong to category 2 but category 3.

- c. **CATEGORY 3:** Rural area, easy to access from statistical provincial offices – *no per diem no air fare*

- a. Province 1 - Torba: the entire island of Vanualava,
- b. Province 2 – Sanma: islands of Malo and Aore,
- c. Province 3 – Penama: island of Ambae – East,
- d. Province 4 – Malampa: island of Malakula – North,
- e. Province 6 – Tafea: the entire island of Tanna

NB: Province 5 - Shefa, does not appear in this category

- d. **CATEGORY 4 :** On each main island of each provinces, remote places – *per diem no air fare*

- a. Province 2 - Sanma : “far Santo”, out of urban and peri urban (see the EA list in appendix 1),
- b. Province 3 - Penama : island of Ambae - West
- c. Province 4 - Malampa : island of Malakula - South
- d. Province 5 - Shefa : island of Efate – North,

NB: Province 1 (Torba) and province 6 (Tafea) are not concerned with this category. There are no remote places in the island of Vanualava (main island of Torba) and Tanna (main island of Tafea).

- e. **CATEGORY 5 :** In the same province, another island – *per diem and air fare*.

- a. Province 1 - Torba: Gaua, Mota, Motalava, Rah,
- b. Province 3 - Penama: Pentecost, Maewo
- c. Province 4 - Malampa: Ambrym, Paama, Maskelynes, Atchin, Rano, Vao, Akhamb, Avock, Tomman, Uripiv, Wala.
- d. Province 5 - Shefa : Epi, Tongoa, Emae, Nguna, Emau, Lamen, Ifira, Tongariki, Lelepa, Makira, Mataso, Moso, Pele.
- e. Province 6 - Tafea : Erromango, Aneityum, Aniwa, Futuna.

NB: Province 2 – Sanma is not concerned, in this province, no other island which needed per diem to survey (Malo is a one day trip survey from Luganville).

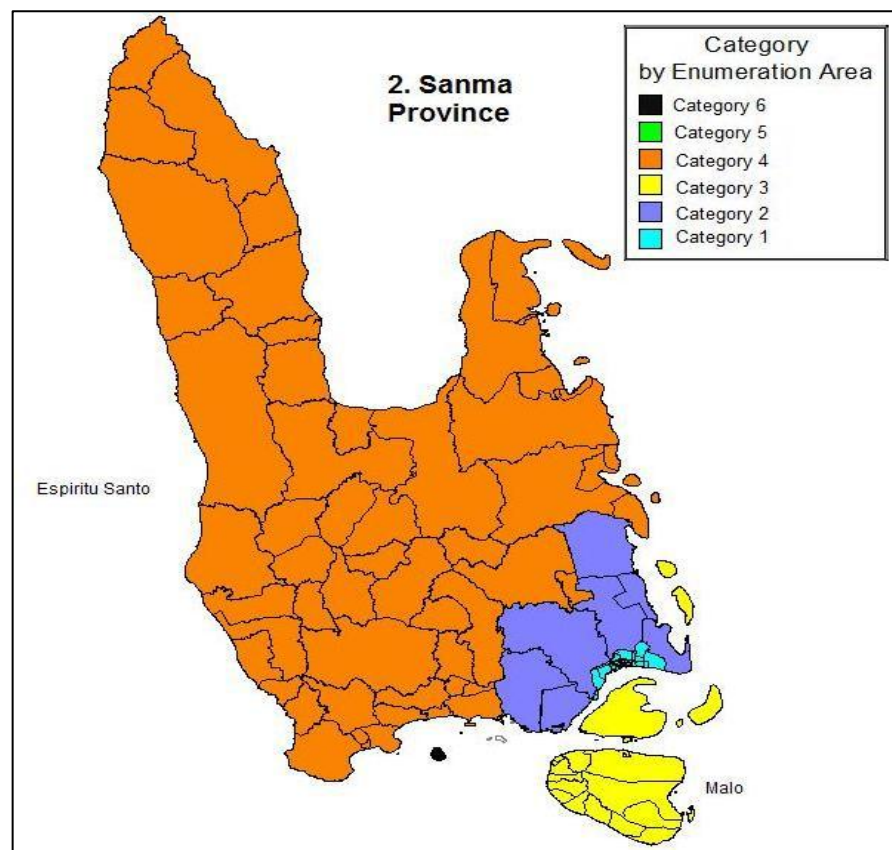
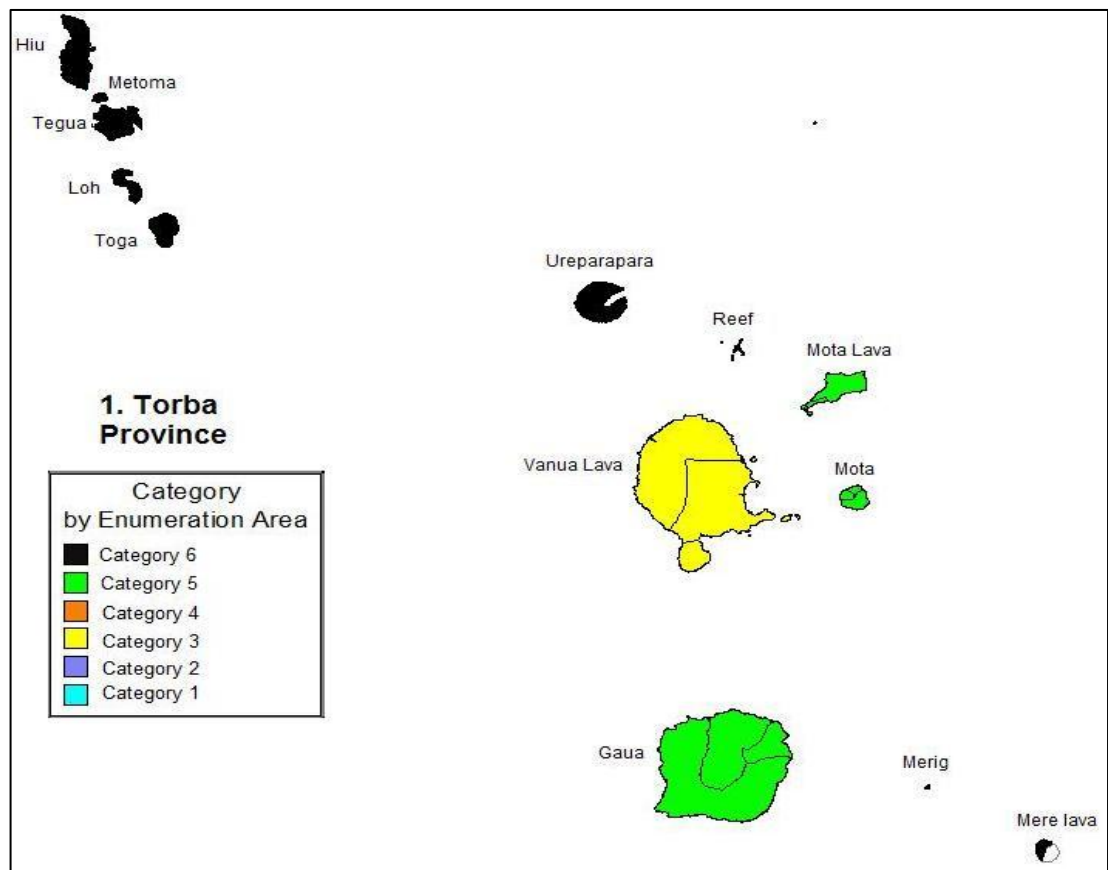
- f. **CATEGORY 6:** remote islands, small and far away, excluded from the selection.

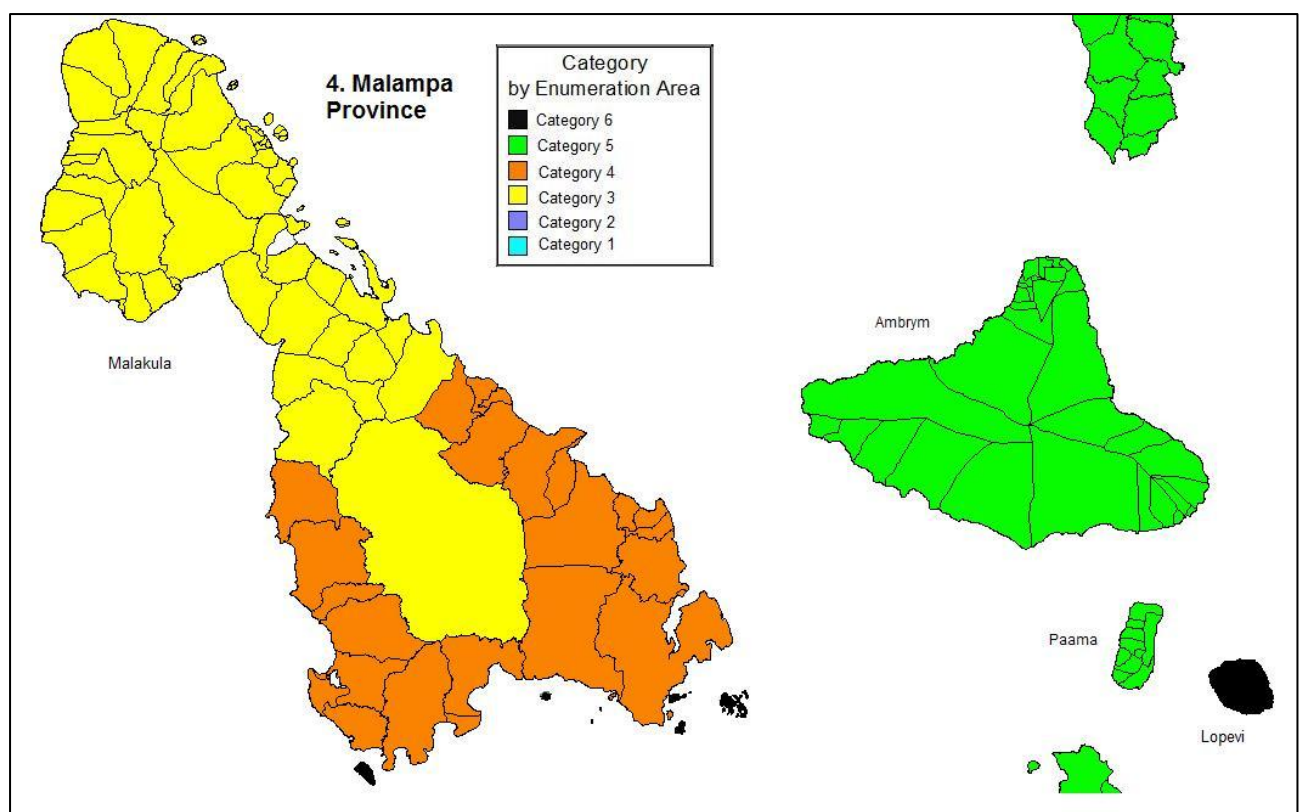
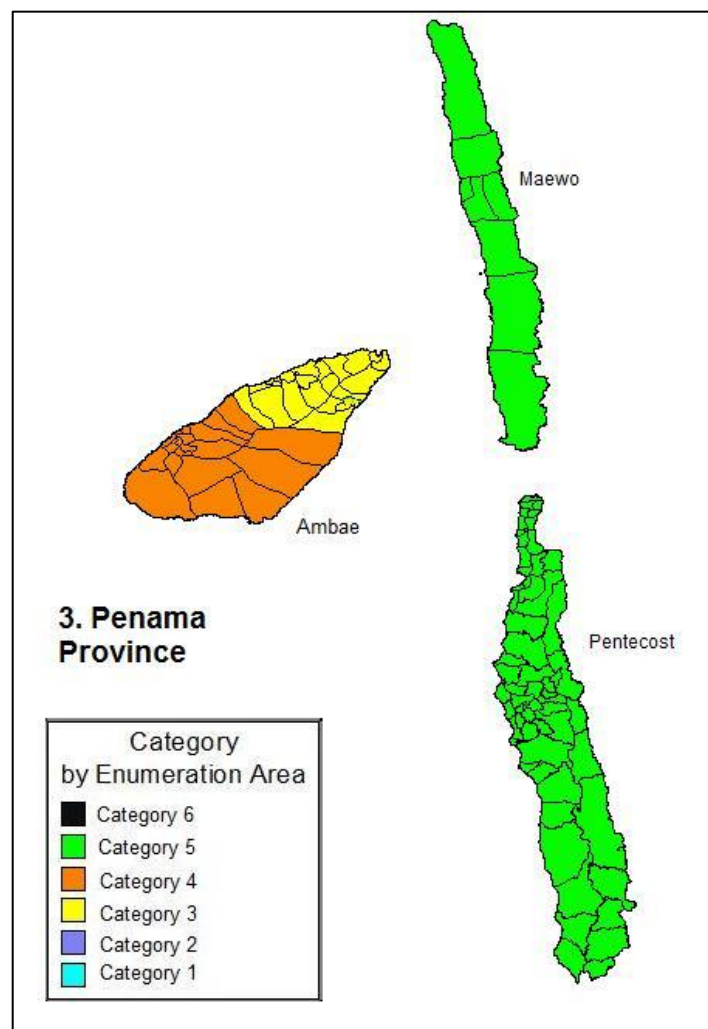
- a. Province 1 - Torba: Merelava, Hiu, Kwakea, Loh, Merig, Metoma, Tegua, Toga, Ureparapara,
- b. Province 2 - Santo: Araki, Bokissa, Malokilikili, Mavea,
- c. Province 4 - Malampa: Maskelynes, Akhamb, Avock, Khoti, Uri, Lopevi
- d. Province 5 – Shefa: Buninga, Tongariki, Makira, Mataso,

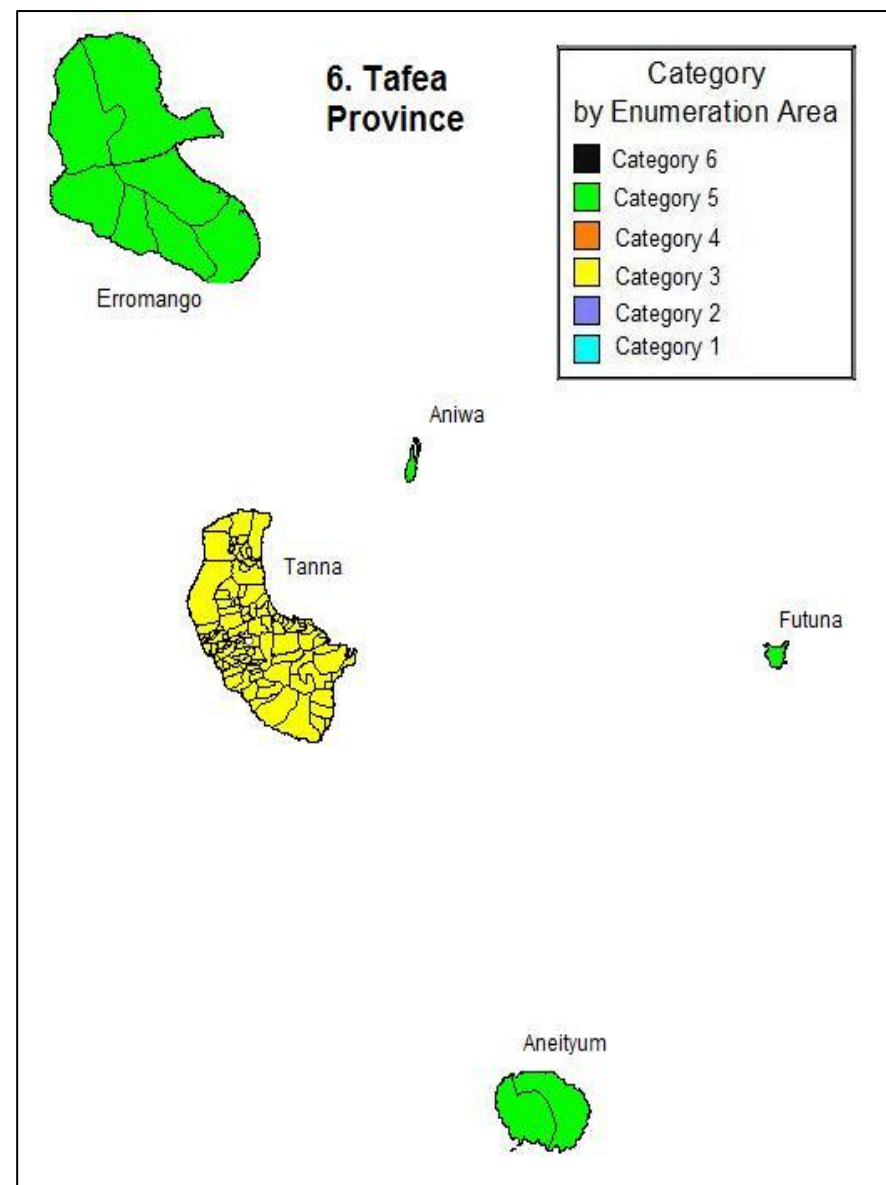
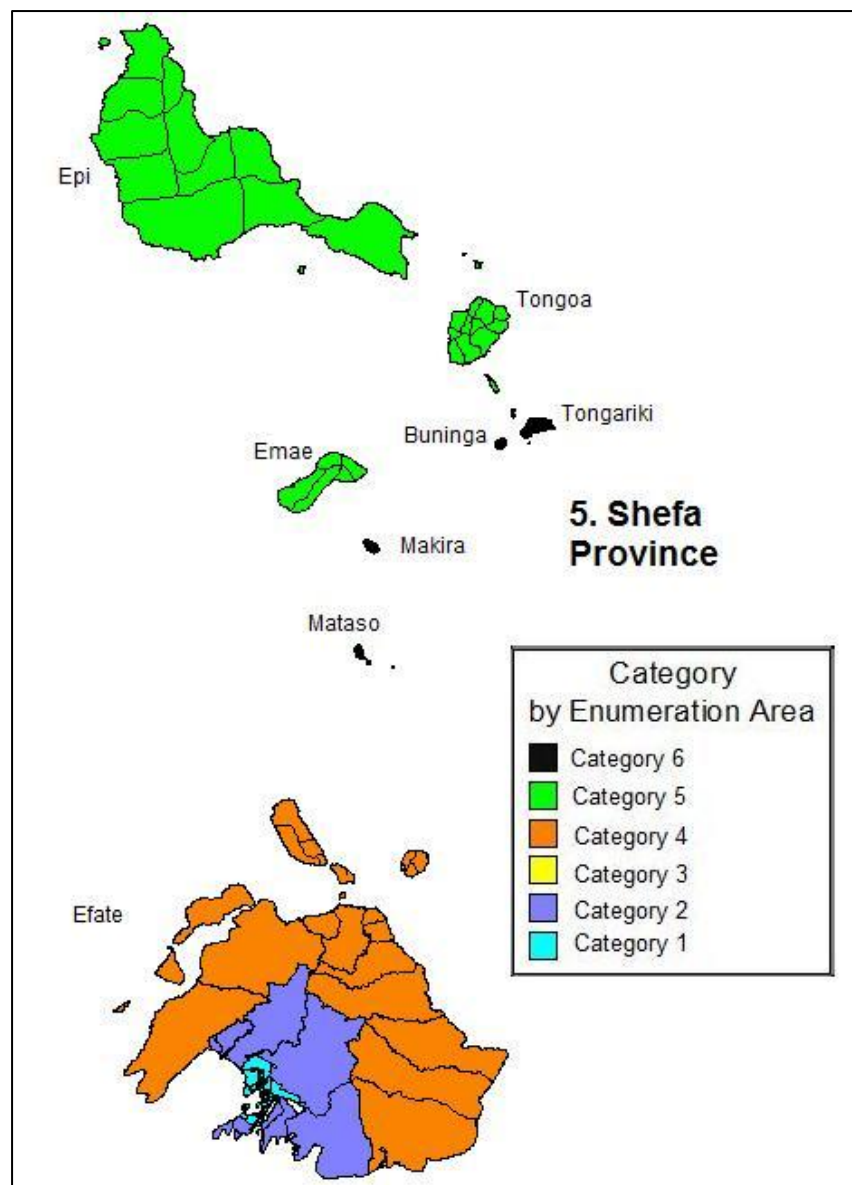
NB: Province 3 – Penama and Province 6 - Tafea are not concerned by this category.

Categories 1 to 5 are not excluded from the selection; category 6 is excluded, for accessibility reason. This means that only 580 households are excluded from the selection (1.2% of the private households).

## Provincial Maps – Category 1 to 6







## Number of Households

Category	Urban		Rural				Total
Province	1	2	3	4	5	6	
1. Torba	0	0	485	0	924	357	<b>1,766</b>
2. Sanma	2,553	1,071	1,177	4,321	0	91	<b>9,213</b>
3. Penama	0	0	1,086	1,139	4,395	0	<b>6,620</b>
4. Malampa	0	0	3,675	1,857	2,241	217	<b>7,990</b>
5. Shefa	9,201	3,058	0	1,668	1,857	146	<b>15,930</b>
6. Tafea	0	0	5,152	0	700	0	<b>5,852</b>
<b>Total</b>	<b>11,754</b>	<b>4,129</b>	<b>11,575</b>	<b>8,985</b>	<b>10,117</b>	<b>811</b>	<b>47,371</b>

The population is composed by 5 categories and 6 provinces, 30 stratum (category 6 excluded).

According to the purpose of 600 urban HHs and 600 rural, this is the proportional allocation of the 1200 HH sample:

## Numbers of Households

Category	Urban		Rural				Total
Province	1	2	3	4	5	6	
1. Torba	0.0	0.0	9.2	0.0	17.6	6.8	<b>33.7</b>
2. Sanma	96.4	40.5	22.4	82.3	0.0	1.7	<b>243.4</b>
3. Penama	0.0	0.0	20.7	21.7	83.7	0.0	<b>126.1</b>
4. Malampa	0.0	0.0	70.0	35.4	42.7	4.1	<b>152.2</b>
5. Shefa	347.6	115.5	0.0	31.8	35.4	2.8	<b>533.0</b>
6. Tafea	0.0	0.0	98.2	0.0	13.3	0.0	<b>111.5</b>
<b>Total</b>	<b>444.0</b>	<b>156.0</b>	<b>220.6</b>	<b>171.2</b>	<b>192.8</b>	<b>15.5</b>	<b>1200.0</b>

Categories 1 and 2 represent the “urban area”, meaning all the households living in the city (census boundaries) adding those living close to the city, who have the possibility to go easily in town every day, for work, shopping, or other facilities. Categories 3 to 6 represent the “rural area”, the household who cannot afford to come easily in town.

The proportional allocation of the sample gives us the ideal number of Household to survey in each of the stratum.

Assuming that one survey team operate with 2 enumerators, each in charge of 6 questionnaires per round.

=> 12 questionnaires per team per round

The sample is a 2 stages sample, mainly due to cartography and household listing reasons.

=> 12 questionnaires per team per round

For safety and transport reasons, enumerators work together in the same area, the area is called PSU, Primary Selected Unit. It is the result of the aggregation of smalls EAs (in terms of number of HHs) which were separated for census reasons. The smallest EAs are aggregated.

Dividing the number of household in each stratum by 12 we have the number of PSU to select (proportional allocation):

Numbers of PSU to select per stratum:

Category	Urban		Rural				Total
Province	1	2	3	4	5	6	
1. Torba	0.0	0.0	0.8	0.0	1.5	0.6	<b>2.8</b>
2. Sanma	8.0	3.4	1.9	6.9	0.0	0.1	<b>20.3</b>
3. Penama	0.0	0.0	1.7	1.8	7.0	0.0	<b>10.5</b>
4. Malampa	0.0	0.0	5.8	2.9	3.6	0.3	<b>12.7</b>
5. Shefa	29.0	9.6	0.0	2.6	2.9	0.2	<b>44.4</b>
6. Tafea	0.0	0.0	8.2	0.0	1.1	0.0	<b>9.3</b>
<b>Total</b>	<b>37.0</b>	<b>13.0</b>	<b>18.4</b>	<b>14.3</b>	<b>16.1</b>	<b>1.3</b>	<b>100.0</b>

In total, only 1 PSU is requested in the category 6, moreover, it is not relevant in terms of cost, so we can assume to exclude it from the sample. According to the proportional allocation of the PSU, we have to re-allocate then with the constraints:

- 50 PSU in urban and 50 in urban area
- multiple of 4 by province, in order to spread them all over the year (at least the 4 quarters of the year),
- Decrease of the cost, choose whenever possible the cheap category (1, 2 or 3).

Reallocation of the PSU under constraints

Category	Urban		Rural				Total
Province	1	2	3	4	5	6	
1. Torba	0	0	2	0	2	0	<b>4</b>
2. Sanma	8	3	2	7	0	0	<b>20</b>
3. Penama	0	0	2	2	8	0	<b>12</b>
4. Malampa	0	0	6	3	3	0	<b>12</b>
5. Shefa	30	9	0	2	3	0	<b>44</b>
6. Tafea	0	0	7	0	1	0	<b>8</b>
<b>Total</b>	<b>38</b>	<b>12</b>	<b>19</b>	<b>14</b>	<b>17</b>	<b>0</b>	<b>100</b>

In terms of teams, 2 teams in Shefa, one in each other provinces. One team can survey one PSU per round, 24 maximum a year (full time). In torba, the team will work only 4 rounds in the year (2 months), however in Sanma, 24 rounds a year(maximum). In Shefa, we expect 44 PSU, the work load of 2 teams, 22 PSU each.

Number of Households related

<b>Category</b>	<b>Urban</b>		<b>Rural</b>				<b>Total</b>
<b>Province</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
1. Torba	0	0	24	0	24	0	<b>48</b>
2. Sanma	96	36	24	84	0	0	<b>240</b>
3. Penama	0	0	24	24	96	0	<b>144</b>
4. Malampa	0	0	72	36	36	0	<b>144</b>
5. Shefa	360	108	0	24	36	0	<b>528</b>
6. Tafea	0	0	84	0	12	0	<b>96</b>
<b>Total</b>	<b>456</b>	<b>144</b>	<b>228</b>	<b>168</b>	<b>204</b>	<b>0</b>	<b>1200</b>

Sampling weights associated

<b>Category</b>	<b>Urban</b>		<b>Rural</b>			
<b>Province</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
1. Torba	0.0	0.0	20.2	0.0	38.5	0.0
2. Sanma	26.6	29.8	49.0	51.4	0.0	0.0
3. Penama	0.0	0.0	45.3	47.5	45.8	0.0
4. Malampa	0.0	0.0	51.0	51.6	62.3	0.0
5. Shefa	25.6	28.3	0.0	69.5	51.6	0.0
6. Tafea	0.0	0.0	61.3	0.0	58.3	0.0



## 2. Cost of PSU to survey

For each stratum, we can estimate the cost of one PSU to survey according to:

- supervisor salary amount (including 8% taxes)
- enumerators salary amount (including 8% taxes)
- enumerator's perdiem (only for round in category 4 and 5)
- supervisor's perdiem (only for round in category 4 and 5)
- transport in the island (bus and taxi)
- air fare for round in another island

Vanuatu statistical office has recruited provincial supervisors in each of the 5 provinces out of Shefa (where the central office is based). This staffs are targeted to work on this survey as supervisors, in charge of the data collection and the data entry. The recruitment of a team supervisor is only required in Shefa. The following table shows the budget lines to pay for one round of collection for one team. The cost of one round will not be the same in each of the 2 urban areas:

- Port Vila's team (capital town of Vanuatu, province of Shefa, island of Efate) requires the recruitments of one supervisor,
- Luganville's team (second main city, province of Sanma, island of Santo) do not require the recruitment of a supervisor, possible to work with the provincial statistics staff (like in other rural provinces).

Main budget lines for one round of collection for one team according to the stratum

Category	SHEFA PROVINCE				OTHER PROVINCES				
	Urban (Vila)		Rural		Urban (Luganville)		Rural		
	1	2	4	5	1	2	3	4	5
	Down-town	Peri-urban	Far rural	Other island	Down-town	Peri-urban	Near rural	Far rural	Other island
Costs									
1. Supervisor salary	X	X	X	X					
2. Enumerators salary	X	X	X	X	X	X	X	X	X
3. Perdiem supervisor			X	X				X	X
4. Perdiem enumerators			X	X				X	X
5. Transport (bus/taxi)	X	X	X	X	X	X	X	X	X
6. Air fare				X					X

Related costs (Vatu\*): province of Shefa

Category	Urban Port Vila (Shefa)		Rural		
	1	2	3	4	5
	Down-town	Peri- urban	Near rural	Far rural	Other island
Costs					
1. Supervisor salary	45,360	45,360	-	45,360	45,360
2. Enumerators salary	69,984	69,984	-	69,984	69,984
3. Perdiem supervisor	-	-	-	27,060	27,060
4. Perdiem enumerators	-	-	-	54,120	54,120
5. Transport (bus/taxi)	18,000	18,000	-	30,000	18,000
6. Air fare	-	-	-	-	60,000
TOTAL	133,344	133,344	-	226,524	274,524

\*1 Vatu = 0.0111 USD

Related costs (USD): province of Shefa

Category	Urban Port Vila (Shefa)		Rural		
	1	2	3	4	5
	Down-town	Peri- urban	Near rural	Far rural	Other island
Costs					
1. Supervisor salary	504	504	-	504	504
2. Enumerators salary	778	778	-	778	778
3. Perdiem supervisor	-	-	-	301	301
4. Perdiem enumerators	-	-	-	601	601
5. Transport (bus/taxi)	200	200	-	333	200
6. Air fare	-	-	-	-	667
TOTAL	1,481	1,481	-	2,517	3,050

Related costs (Vatu\*) other provinces (out of Shefa)

Category	Urban Luganville (Sanma)		Rural		
	1	2	3	4	5
	Down-town	Peri- urban	Near rural	Far rural	Other island
Costs					
1. Supervisor salary	-	-	-	-	-
2. Enumerators salary	69,984	69,984	69,984	69,984	69,984
3. Perdiem supervisor	-	-	-	120,000	120,000
4. Perdiem enumerators	-	-	-	54,120	54,120
5. Transport (bus/taxi)	18,000	18,000	18,000	30,000	18,000
6. Air fare	-	-	-	-	60,000
TOTAL	87,984	87,984	87,984	274,104	322,104

\*1 Vatu = 0.0111 USD

Related costs (USD) other provinces (out of Shefa)

Category	Urban Luganville (Sanma)		Rural		
	1	2	3	4	5
	Down-town	Peri-urban	Near rural	Far rural	Other island
Costs					
1. Supervisor salary	-	-	-	-	-
2. Enumerators salary	778	778	778	778	778
3. Perdiem supervisor	-	-	-	1,333	1,333
4. Perdiem enumerators	-	-	-	601	601
5. Transport (bus/taxi)	200	200	200	333	200
6. Air fare			-	-	667
TOTAL	978	978	978	3,046	3,579

Cost of one round per stratum (Vatu)

Category	Urban		Rural		
Province	1	2	3	4	5
1. Torba	-	-	87,984	-	322,104
2. Sanma	87,984	87,984	87,984	274,104	-
3. Penama	-	-	87,984	274,104	322,104
4. Malampa	-	-	87,984	274,104	322,104
5. Shefa	133,344	133,344	-	226,524	274,524
6. Tafea	-	-	87,984	-	322,104

Cost of one round per stratum (USD)

Category	Urban		Rural		
Province	1	2	3	4	5
1. Torba	-	-	978	-	3,579
2. Sanma	978	978	978	3,046	-
3. Penama	-	-	978	3,046	3,579
4. Malampa	-	-	978	3,046	3,579
5. Shefa	1,482	1,482	-	2,517	3,050
6. Tafea	-	-	978	-	3,579

See in the appendix 1 the details of the amount.

Reallocation of the PSU under constraints

Category	Urban		Rural			Total
Province	1	2	3	4	5	
1. Torba	0	0	2	0	2	4
2. Sanma	8	3	2	7	0	20
3. Penama	0	0	2	2	8	12
4. Malampa	0	0	6	3	3	12
5. Shefa	30	9	0	2	3	44
6. Tafea	0	0	7	0	1	8
<b>Total</b>	<b>38</b>	<b>12</b>	<b>19</b>	<b>14</b>	<b>17</b>	<b>100</b>

Total cost of the collection per stratum (Vatu)

Category	Urban		Rural			Total
Province	1	2	3	4	5	
1. Torba	0	0	175,968	0	644,208	820,176
2. Sanma	703,872	263,952	175,968	1,918,728	0	3,062,520
3. Penama	0	0	175,968	548,208	2,576,832	3,301,008
4. Malampa	0	0	527,904	822,312	966,312	2,316,528
5. Shefa	4,000,320	1,200,096	0	453,048	823,572	6,477,036
6. Tafea	0	0	615,888	0	322,104	937,992
<b>Total</b>	<b>4,704,192</b>	<b>1,464,048</b>	<b>1,671,696</b>	<b>3,742,296</b>	<b>5,333,028</b>	<b>16,915,260</b>

Total cost of the collection per stratum (USD)

Category	Urban		Rural			Total
Province	1	2	3	4	5	
1. Torba	0	0	1,955	0	7,157	9,112
2. Sanma	7,820	2,933	1,955	21,317	0	34,025
3. Penama	0	0	1,955	6,091	28,629	36,674
4. Malampa	0	0	5,865	9,136	10,736	25,737
5. Shefa	44,444	13,333	0	5,033	9,150	71,960
6. Tafea	0	0	6,843	0	3,579	10,421
<b>Total</b>	<b>52,264</b>	<b>16,266</b>	<b>18,573</b>	<b>41,577</b>	<b>59,250</b>	<b>187,929</b>

This budget is based on a provincial supervisor per diem of 10 000 Vt (110 USD) a day, and an enumerator per diem of 2255 Vt (25 USD) a day (to pay accommodation and food in rounds of categories 4 and 5). Provincial supervisor and Shefa supervisor will do the same job but will be treated in a different way. Provincial supervisors belong to the local administration, and Shefa supervisor will be recruited specifically for the survey.

This per diem amount appears very high and out of all proportion, and creates serious problems as:

- Increasing the budget very much,
- Imbalance between supervisor and enumerators in terms of per diem amount,
- Imbalance between supervisor from Vila (recruited for the survey) and provincial supervisors (permanent staff) in terms of per diem amount.

The second scenario suggests to pay the same amount of per diem to supervisors and enumerators all over the country (2255 Vatu or 25 USD per day).

Related costs (Vatu\*) : province of Shefa

Category	Urban Port Vila (Shefa)		Rural		
	1	2	3	4	5
	Down-town	Peri-urban	Near rural	Far rural	Other island
Costs					
1. Supervisor salary	45,360	45,360	-	45,360	45,360
2. Enumerators salary	69,984	69,984	-	69,984	69,984
3. Per diem supervisor	-	-	-	27,060	27,060
4. Per diem enumerators	-	-	-	54,120	54,120
5. Transport (bus/taxi)	18,000	18,000	-	30,000	18,000
6. Air fare	-	-	-	-	60,000
<b>TOTAL</b>	<b>133,344</b>	<b>133,344</b>	<b>-</b>	<b>226,524</b>	<b>274,524</b>

\*1 Vatu = 0.0111 USD

Related costs (USD) : province of Shefa

Category	Urban Port Vila (Shefa)		Rural		
	1	2	3	4	5
	Down-town	Peri-urban	Near rural	Far rural	Other island
Costs					
1. Supervisor salary	503	503	-	503	503
2. Enumerators salary	777	777	-	777	777
3. Per diem supervisor	-	-	-	300	300
4. Per diem enumerators	-	-	-	601	601
5. Transport (bus/taxi)	200	200	-	333	200
6. Air fare	-	-	-	-	666
<b>TOTAL</b>	<b>1,480</b>	<b>1,480</b>	<b>-</b>	<b>2,514</b>	<b>3,047</b>

Related costs (Vatu) : other provinces (out of Shefa)

Category	Urban Luganville (Sanma)		Rural		
	1	2	3	4	5
	Down-town	Peri-urban	Near rural	Far rural	Other island
Costs					
1. Supervisor salary	-	-	-	-	-
2. Enumerators salary	69,984	69,984	69,984	69,984	69,984
3. Perdiem supervisor	-	-	-	27,060	27,060
4. Perdiem enumerators	-	-	-	54,120	54,120
5. Transport (bus/taxi)	18,000	18,000	18,000	30,000	18,000
6. Air fare			-	-	60,000
TOTAL	87,984	87,984	87,984	181,164	229,164

Related costs (USD) : other provinces (out of Shefa)

Category	Urban Luganville (Sanma)		Rural		
	1	2	3	4	5
	Down-town	Peri-urban	Near rural	Far rural	Other island
Costs					
1. Supervisor salary	-	-	-	-	-
2. Enumerators salary	777	777	777	777	777
3. Perdiem supervisor	-	-	-	300	300
4. Perdiem enumerators	-	-	-	601	601
5. Transport (bus/taxi)	200	200	200	333	200
6. Air fare			-	-	666
TOTAL	977	977	977	2,011	2,544

Cost of one round per stratum (Vatu)

Category	Urban		Rural		
Province	1	2	3	4	5
1. Torba	-	-	87,984	-	229,164
2. Sanma	87,984	87,984	87,984	181,164	-
3. Penama	-	-	87,984	181,164	229,164
4. Malampa	-	-	87,984	181,164	229,164
5. Shefa	133,344	133,344	-	226,524	274,524
6. Tafea	-	-	87,984	-	229,164

Cost of one round per stratum (USD)

Category	Urban		Rural		
Province	1	2	3	4	5
1. Torba	-	-	977	-	2,544
2. Sanma	977	977	977	2,011	-
3. Penama	-	-	977	2,011	2,544
4. Malampa	-	-	977	2,011	2,544
5. Shefa	1,480	1,480	-	2,514	3,047
6. Tafea	-	-	977	-	2,544

See in the appendix 2 the detail of the amount.

Related total cost (Vatu)

Category	Urban		Rural			Total
Province	1	2	3	4	5	
1. Torba	0	0	175,968	0	458,328	634,296
2. Sanma	703,872	263,952	175,968	1,268,148	0	2,411,940
3. Penama	0	0	175,968	362,328	1,833,312	2,371,608
4. Malampa	0	0	527,904	543,492	687,492	1,758,888
5. Shefa	4,000,320	1,200,096	0	453,048	823,572	6,477,036
6. Tafea	0	0	615,888	0	229,164	845,052
<b>Total</b>	<b>4,704,192</b>	<b>1,464,048</b>	<b>1,671,696</b>	<b>2,627,016</b>	<b>4,031,868</b>	<b>14,498,820</b>

Related total cost (USD)

Category	Urban		Rural			Total
Province	1	2	3	4	5	
1. Torba	0	0	1,955	0	5,092	7,047
2. Sanma	7,820	2,933	1,955	14,089	0	26,797
3. Penama	0	0	1,955	4,025	20,368	26,349
4. Malampa	0	0	5,865	6,038	7,638	19,541
5. Shefa	44,444	13,333	0	5,033	9,150	71,960
6. Tafea	0	0	6,843	0	2,546	9,389
<b>Total</b>	<b>52,264</b>	<b>16,266</b>	<b>18,573</b>	<b>29,186</b>	<b>44,794</b>	<b>161,082</b>

Reducing the provincial supervisor per diem from 10 000 Vt a day to 2 255 Vt a day (110 USD to 25 USD), the budget decreases from 17 to 14.5 million Vt (188 000 to 161 000 USD - 15% less).

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### 3. Selection of households

The sample strategy (part1) gives us the number of PSU to select and the geographic area to do the selection. The sample is a 2 stages sample in the rural area (category 3 & 4) and on stage in the urban area (giving best estimation). The selection is operated by stratum, and in each stratum, every household have the same probability to be selected.

- Rural area sample

**Step 1:** probability to select a PSU in rural area stratum =

$$\text{Number of HHs of the PSU} * \frac{\text{number of PSU to select in the stratum}}{\text{total number of HHs in the stratum}}$$

According to these probabilities, 50 PSUs are selected in the rural area.

**Step 2:** probability to select a HH in the PSU selected =

$$\frac{\text{number of HH to select in the PSU}}{\text{total number of HHs in the PSU}}$$
$$\frac{18}{\text{total number of HHs in the PSU}}$$

The number of HHs to select in the PSU is 12, the workload of one team for one round (2 enumerators, 6 HHs each). In case of refusal or any other reasons which do not allow the enumerator to survey the HHs, we select a second list of 6 HHs to replace. This list increases the size of the sample by 50%. As a result, 18 HHs are selected in each PSU of the rural area (900 in the rural area).

- Urban area sample

We select HHs in a one stage strategy in Luganville and Port Vila urban and peri urban (category 1&2 of Sanma and Shefa provinces):

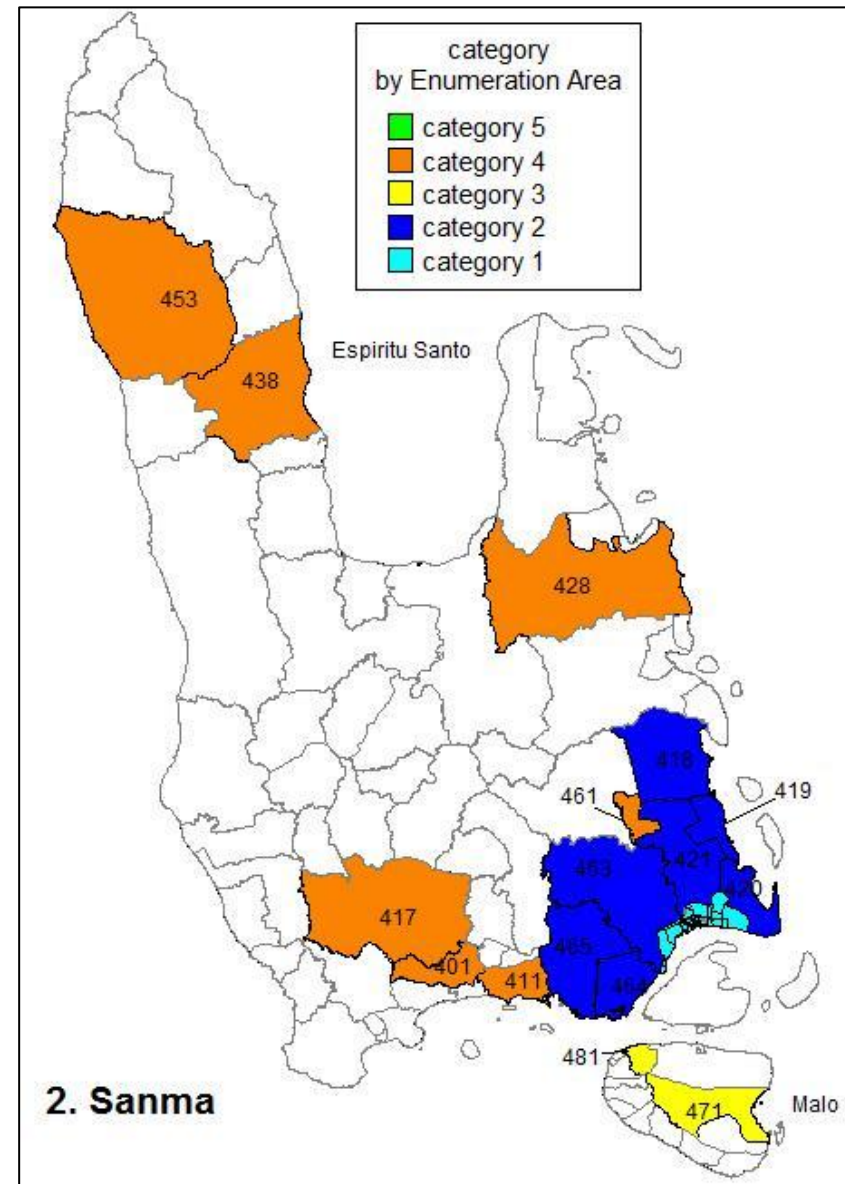
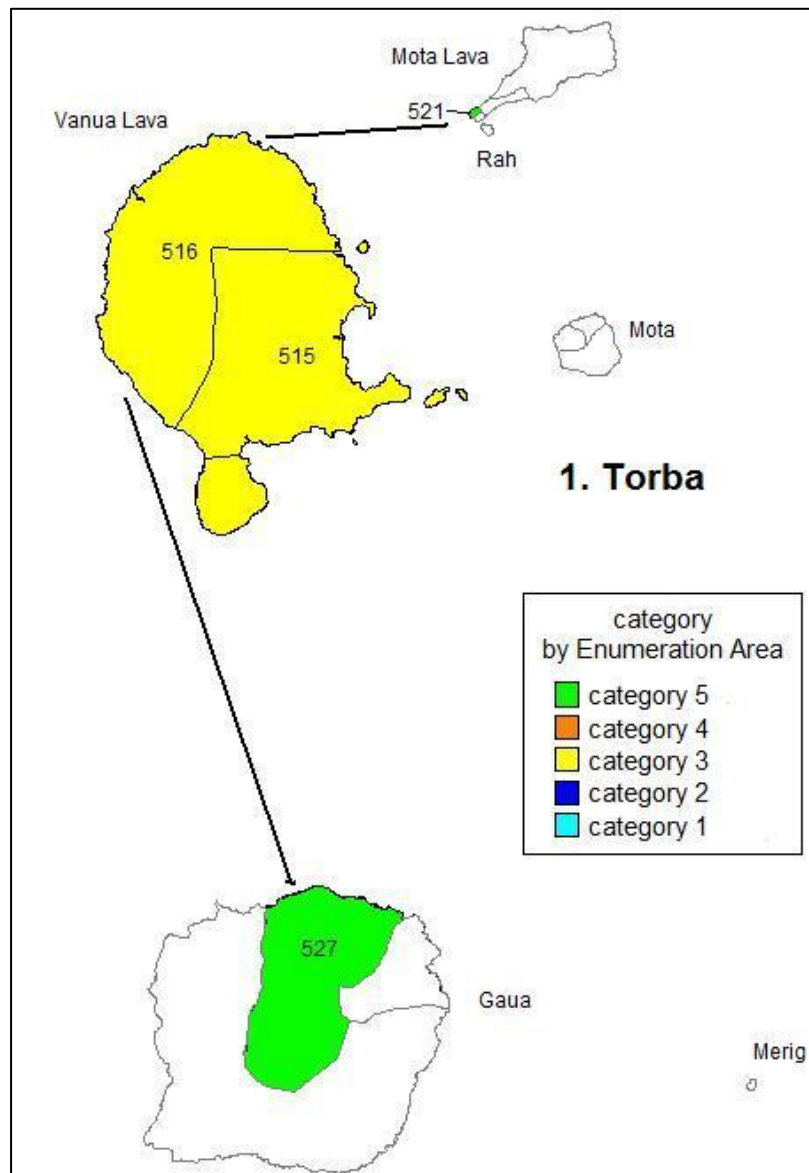
- Santo urban and peri urban (Luganville), sample size is 132 HHs to survey => 198 HHs to select,
- Shefa urban and peri urban (Port Vila), sample size is 468 HHs to survey => 702 HHs to select.

The selection probability is the same for each HH in the 2 areas:

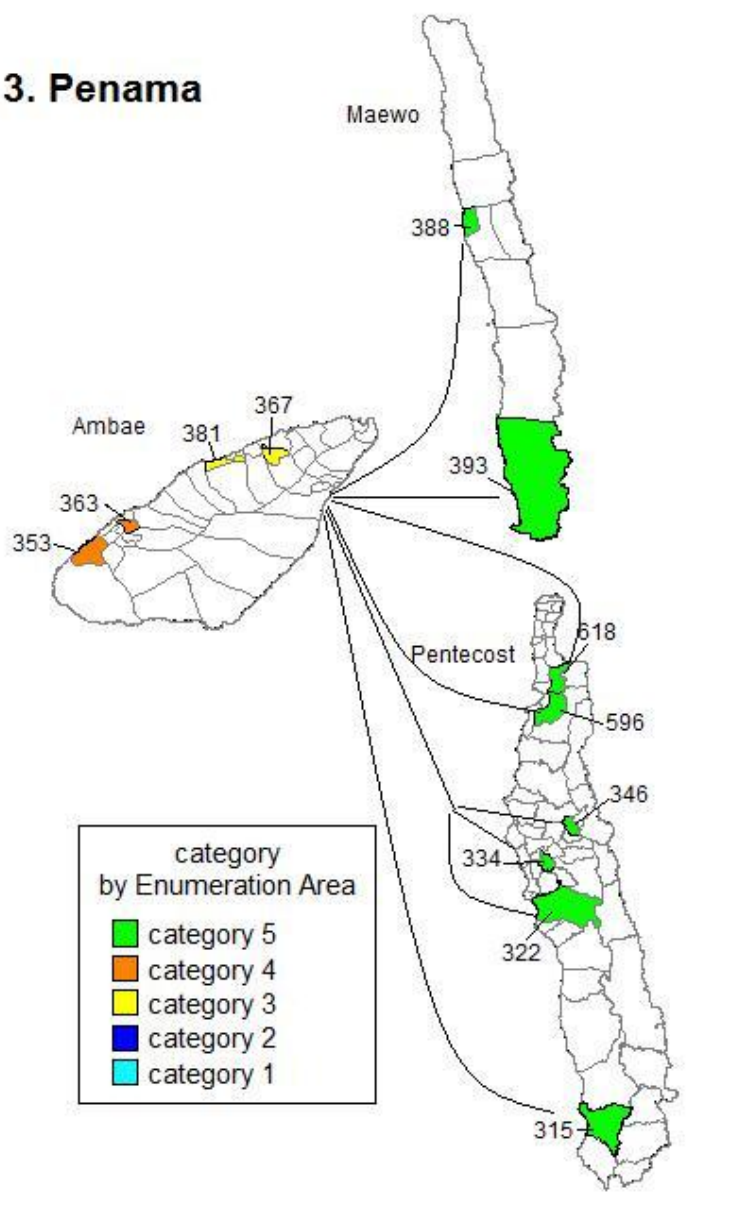
$$\frac{\text{number of HHs to select in urban area}}{\text{total number of HHs in the urban area}}$$



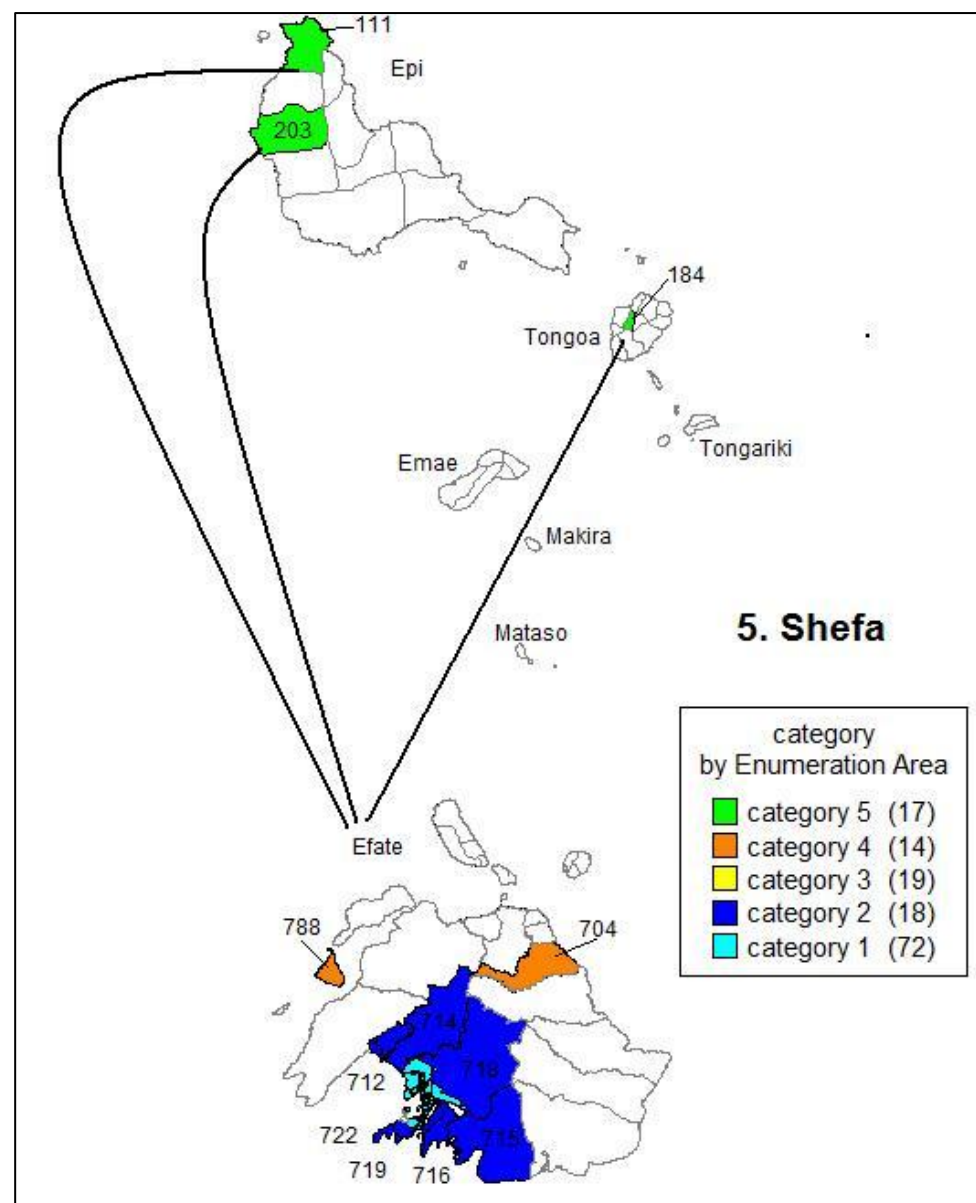
#### 4. The sample

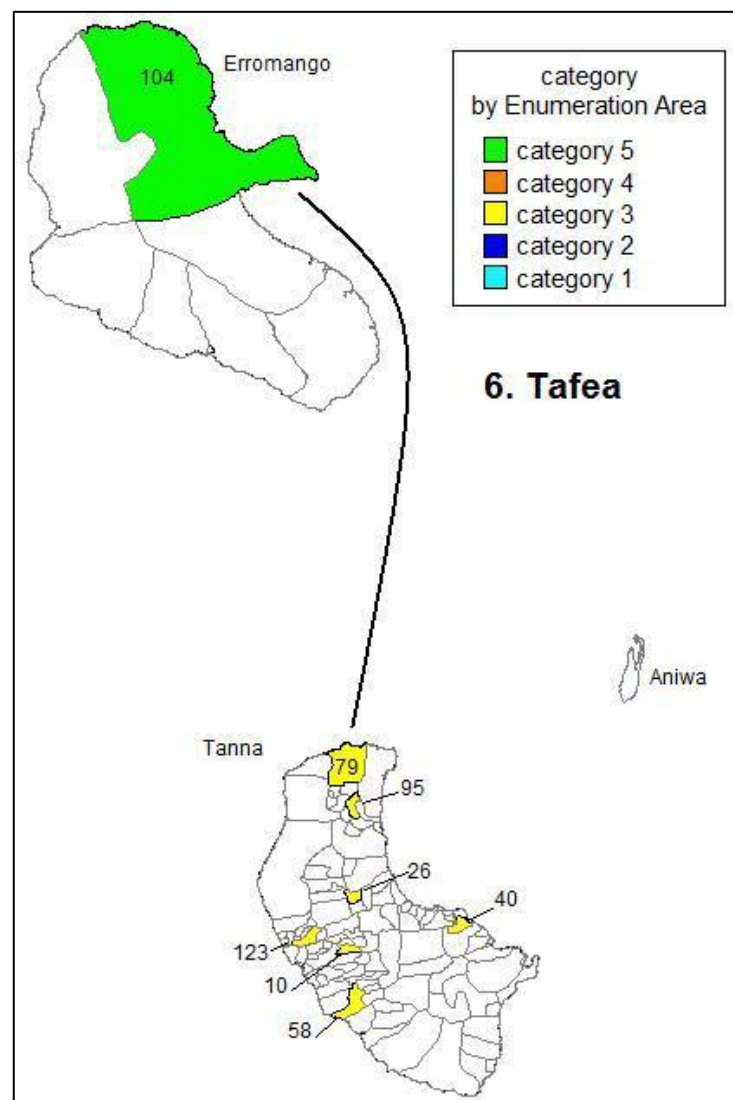
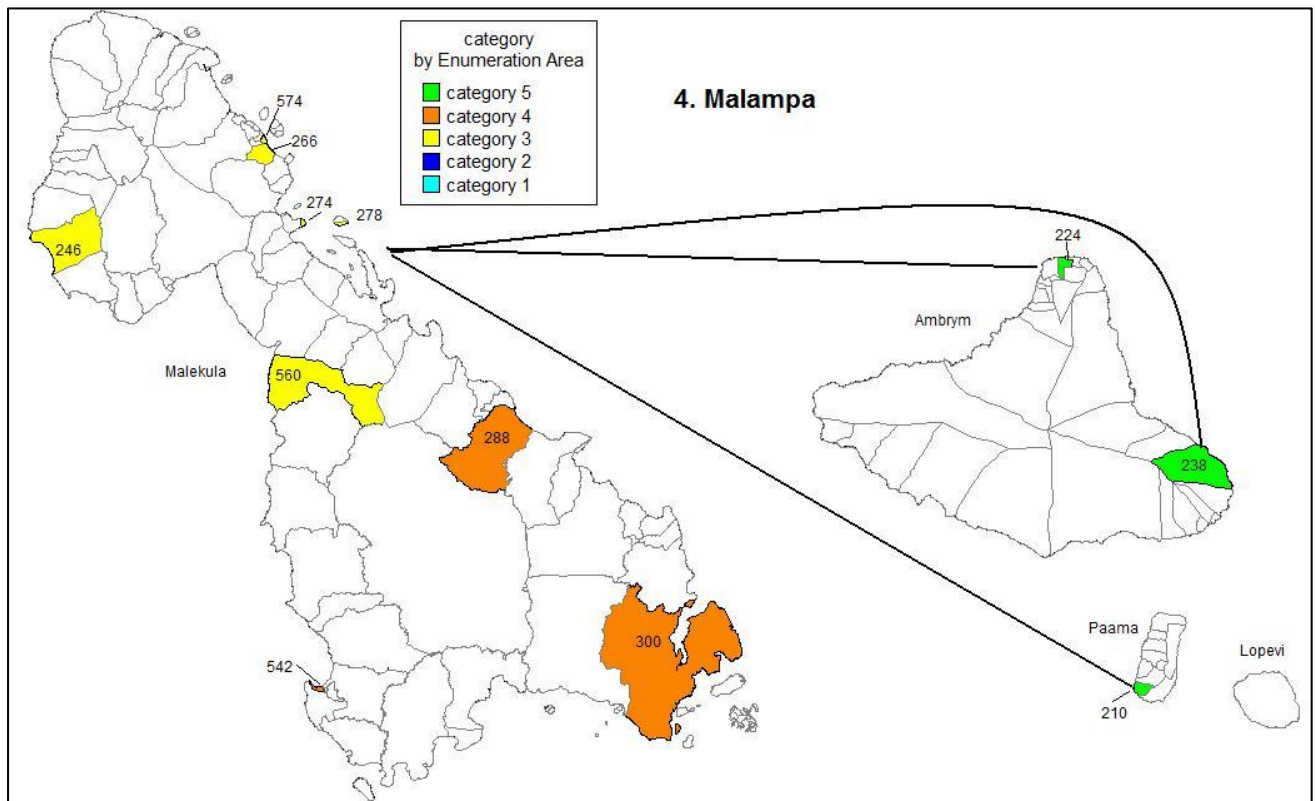


### 3. Penama



### 5. Shefa





## 5. Sample planning – team workload

The sample is equally spread out across the 4 quarters of the year, 300 households surveyed per quarter. According to the selection, this is the sample planning across the 4 quarters:

Number of households to survey per province and category:

			quarter				TOTAL
province	island	category	1	2	3	4	
1. Torba	VANUALAVA	3	12		12		24
	GAUA	5				12	12
	MOTALAVA	5		12			12
	Total Torba		12	12	12	12	48
2. Sanma	SANTO	1&2	36	24	36	36	132
	MALO	3		12		12	24
	SANTO	4	24	24	24	12	84
	Total Sanma		60	60	60	60	240
3. Penama	AMBAE	3	12		12		24
	AMBAE	4		12		12	24
	MAEWO	5	12		12		24
	PENTECOST	5	12	24	12	24	72
	Total Penama		36	36	36	36	144
4. Malampa	MALAKULA	3	12	24	24	12	72
	MALAKULA	4	12		12	12	36
	AMBRYM	5	12			12	24
	PAAMA	5		12			12
	Total Malampa		36	36	36	36	144
5. Shefa	EFATE	1&2	120	120	108	120	468
	EFATE	4	12		12		24
	TONGOA	5			12		12
	EPI	5		12		12	24
	Total Shefa		132	132	132	132	528
6. Tafea	TANNA	3	24	24	12	24	84
	ERROMANGO	5			12		12
	Total Tafea		24	24	24	24	96
VANUATU TOTAL			300	300	300	300	1,200

- ⇒ One quarter is divided in 6 rounds;
- ⇒ one round is the time period required to survey 12 households for one team.
- ⇒ One team can survey 72 households a quarter.
- ⇒ Only one team are required per province, except in Shefa, where the number of households per quarter is 132, 2 teams required.

Area (island + category) to survey per provincial team

Time period Quarter / round		Team of						
		Torba	Sanma	Penama	Malampa	Shefa 1	Shefa2	Tafea
Q 1	Round 1	Vanualava 3	Santo 1&2	Ambae 3 Maewo 5	Malakula 3	Efate 1&2	Efate 1&2	Tanna 3
	Round 2		Santo 4		Malakula 4	Efate 1&2	Efate 1&2	Tanna 3
	Round 3		Santo 1&2			Efate 1&2	Efate 1&3	
	Round 4		Santo 4 Santo 1&2	Pentecost 5		Efate 1&2	Efate 4	
	Round 5					Efate 1&2	Efate 1&3	
	Round 6			Ambrym 5	Efate 1&2	Efate 1&3		
Q 2	Round 7	Motalava 5	Malo 3	Pentecost 5 Ambae 4	Malakula 3	Efate 1&2	Efate 1&2	Tanna 3
	Round 8	Santo 1&2	Vanualava 3		Paama 5	Epi 5	Efate 1&2	
	Round 9	Santo 4					Efate 1&2	
	Round 10	Santo 1&2 Santo 4		Malakula 3			Efate 1&2	Efate 1&2
	Round 11			Efate 1&2	Efate 1&2			
	Round 12			Pentecost 5	Efate 1&2	Efate 1&2		
Q 3	Round 13	Vanualava 3	Santo 1&2	Ambae 3	Malakula 3	Efate 4	Tongoa 5	Tanna 3
	Round 14	Santo 4	Pentecost 5				Efate 1&2	
	Round 15	Santo 1&2	Malakula 4	Efate 1&2	Efate 1&2	Erromango 5		
	Round 16	Santo 4 Santo 1&2		Maewo 5	Efate 1&2		Efate 1&2	
	Round 17				Malakula 3		Efate 1&2	Efate 1&2
	Round 18							
Q 4	Round 19	Gaua 5	Santo 1&2 Malo 3	Pentecost 5	Ambrym 5	Efate 1&2	Efate 1&2	Tanna 3
	Round 20	Vanualava 3		Ambae 4		Efate 1&2	Efate 1&2	
	Round 21	Santo 1&2	Malakula 3	Efate 1&2	Epi 5	Tanna 3		
	Round 22	Santo 1&2		Pentecost 5			Efate 1&2	Efate 1&2
	Round 23	Santo 4					Efate 1&2	Efate 1&2
	Round 24	Santo 1&2	Malakula 4	Efate 1&2	Efate 1&2			

- ⇒ 300 households to survey by quarter,
- ⇒ 100 households per month,
- ⇒ 50 per round (2 rounds in one month),
- ⇒ 50 is not a multiple of 12, so as closed as possible to 50, per round.

In order to have a good balance of the survey in a quarter, this is the number of households to survey related to the planning above:

Time period Quarter / round		Team of							Total
		Torba	Sanma	Penama	Malampa	Shefa 1	Shefa2	Tafea	
Q 1	Round 1	12	12	12	12	12	12	12	84
	Round 2	0	12	0	0	12	12	0	36
	Round 3	0	12	12	0	12	12	0	48
	Round 4	0	0	0	12	12	0	12	36
	Round 5	0	12	12	0	12	12	0	48
	Round 6	0	12	0	12	12	12	0	48
Q 2	Round 7	12	12	0	12	12	12	0	60
	Round 8	0	12	12	0	0	12	12	48
	Round 9	0	12	0	12	12	12	0	48
	Round 10	0	0	12	0	12	12	12	48
	Round 11	0	12	0	12	12	12	0	48
	Round 12	0	12	12	0	12	12	0	48
Q 3	Round 13	12	12	12	0	0	12	0	48
	Round 14	0	12	0	12	12	12	12	60
	Round 15	0	12	12	0	12	12	0	48
	Round 16	0	0	0	12	12	12	12	48
	Round 17	0	12	12	0	12	12	0	48
	Round 18	0	12	0	12	12	12	0	48
Q 4	Round 19	12	0	12	0	12	12	0	48
	Round 20	0	12	0	12	12	12	0	48
	Round 21	0	12	12	0	12	12	12	60
	Round 22	0	12	0	12	12	12	0	48
	Round 23	0	12	12	0	12	0	12	48
	Round 24	0	12	0	12	12	12	0	48

Each round, 48 or 60 households to survey, 300 per quarter, 1200 a year. The appendix 3 details the date of each round.

# APPENDIX 1 – Provincial Budget for one round of survey – Scenario 1

Budget for one PSU to survey (12 households) in the Province of Shefa

Stratum - SHEFA	VATU					USD
<b>EFATE Urban - Semi urban (cat 1&amp;2)</b>	<b>133,344</b>					<b>1,481</b>
Salary enumerators	2	12	days	2,700	64,800	
Taxes enumerators (8%)	2	12	days	216	5,184	
Salary Supervisor	1	12	days	3,500	42,000	
Taxes Supervisor (8%)	1	12	days	280	3,360	
Perdiem enumerators	2	12	days	0	0	
Perdiem supervisor	1	12	days	0	0	
Transport (bus taxi)	3	12	days	500	18,000	
Air fare	0	1	trip	20,000	0	
<b>EFATE far rural (cat 4)</b>	<b>226,524</b>					<b>2,515</b>
Salary enumerators	2	12	days	2,700	64,800	
Taxes enumerators (8%)	2	12	days	216	5,184	
Salary Supervisor	1	12	days	3,500	42,000	
Taxes Supervisor (8%)	1	12	days	280	3,360	
Perdiem enumerators	2	12	days	2,255	54,120	
Perdiem supervisor	1	12	days	2,255	27,060	
Transport (pick up)	3	1	trip	4,000	12,000	
Transport (bus taxi)	3	12	days	500	18,000	
Air fare	0	1	trip	20,000	0	
<b>Shefa ex-Efate (cat 5)</b>	<b>274,524</b>					<b>3,047</b>
Salary enumerators	2	12	days	2,700	64,800	
Taxes enumerators (8%)	2	12	days	216	5,184	
Salary Supervisor	1	12	days	3,500	42,000	
Taxes Supervisor (8%)	1	12	days	280	3,360	
Perdiem enumerators	2	12	days	2,255	54,120	
Perdiem supervisor	1	12	days	2,255	54,120	
Transport (bus taxi)	3	12	days	500	18,000	
Air fare	0	1	trip	20,000	60,000	

Budget for one PSU to survey (12 households) in other provinces (Vatu)

Stratum 1, 2, 3, 4, 6 - Other provinces					VATU	USD
<b>Other provinces Urban - Semi urban (cat 1&amp;2)</b>					<b>87,984</b>	<b>977</b>
Salary enumerators	2	12	days	2,700	64,800	
Taxes enumerators (8%)	2	12	days	216	5,184	
Salary Supervisor	0	12	days	3,500	0	
Taxes Supervisor (8%)	0	12	days	280	0	
Perdiem enumerators	2	0	days	2,255	0	
Perdiem supervisor	1	0	days	10,000	0	
Transport (bus and taxi)	3	12	days	500	18,000	
Air fare	0	1	trip	20,000	0	
<b>Other province (category 3) – closed rural</b>					<b>87,984</b>	<b>977</b>
Salary enumerators	2	12	days	2,700	64,800	
Taxes enumerators (8%)	2	12	days	216	5,184	
Salary Supervisor	0	12	days	3,500	0	
Taxes Supervisor (8%)	0	12	days	280	0	
Perdiem enumerators	2	0	days	2,255	0	
Perdiem supervisor	1	0	days	10,000	0	
Transport (bus and taxi)	3	12	days	500	18,000	
Air fare	0	1	trip	20,000	0	
<b>Other Province (category 4) – Far away rural</b>					<b>274,104</b>	<b>3,043</b>
Salary enumerators	2	12	days	2,700	64,800	
Taxes enumerators (8%)	2	12	days	216	5,184	
Salary Supervisor	0	12	days	3,500	0	
Taxes Supervisor (8%)	0	12	days	280	0	
Perdiem enumerators	2	12	days	2,255	54,120	
Perdiem supervisor	1	12	days	10,000	120,000	
Transport (bus and taxi)	3	12	days	500	18,000	
Transport (pick up)	3	1	trip	4,000	12,000	
Air fare	0	1	trip	20,000	0	
<b>Other Province (category 5) – other island</b>					<b>322,104</b>	<b>3,575</b>
Salary enumerators	2	12	days	2,700	64,800	
Taxes enumerators (8%)	2	12	days	216	5,184	
Salary Supervisor	0	12	days	3,500	0	
Taxes Supervisor (8%)	0	12	days	280	0	
Perdiem enumerators	2	12	days	2,255	54,120	
Perdiem supervisor	1	12	days	10,000	120,000	
Transport (bus and taxi)	3	12	days	500	18,000	
Transport (pick up)	0	1	trip	4,000	0	
Air fare	3	1	trip	20,000	60,000	



## APPENDIX 2 – Provincial Budget for one round of survey – Scenario 2

Budget for one PSU to survey (12 households) Province of Shefa

Vanuatu	VATU					USD
<b>EFATE – Urban Peri urban (cat 1&amp;2)</b>	<b>133,344</b>					<b>1,480</b>
Salary enumerators	2	12	days	2,700	64,800	
Taxes enumerators (8%)	2	12	days	216	5,184	
Salary Supervisor	1	12	days	3,500	42,000	
Taxes Supervisor (8%)	1	12	days	280	3,360	
Perdiem enumerators	2	12	days	0	0	
Perdiem supervisor	1	12	days	0	0	
Transport	3	12	days	500	18,000	
Air fare	0	1	trip	20,000	0	
<b>EFATE rural (cat 4) – far rural</b>	<b>226,524</b>					<b>2,514</b>
Salary enumerators	2	12	days	2,700	64,800	
Taxes enumerators (8%)	2	12	days	216	5,184	
Salary Supervisor	0	12	days	3,500	42,000	
Taxes Supervisor (8%)	0	12	days	280	3,360	
Perdiem enumerators	2	12	days	2,255	54,120	
Perdiem supervisor	1	12	days	2,255	27,060	
Transport (bus and taxi)	3	12	days	500	18,000	
Transport (pick up)	3	1	trip	4,000	12,000	
Air fare	0	1	trip	20,000	0	
<b>SHEFA other island (cat 5)</b>	<b>274,524</b>					<b>3,047</b>
Salary enumerators	2	12	days	2,700	64,800	
Taxes enumerators (8%)	2	12	days	216	5,184	
Salary Supervisor	1	12	days	3,500	42,000	
Taxes Supervisor (8%)	1	12	days	280	3,360	
Perdiem enumerators	2	12	days	2,255	54,120	
Perdiem supervisor	1	12	days	2,255	27,060	
Transport (bus and taxi)	3	12	days	500	18,000	
Air fare	3	1	trip	20,000	60,000	

Budget for one PSU to survey (12 households) in other provinces (Vatu)

Stratum 1, 2, 3, 4, 6 - Other provinces					VATU	USD
<b>Other provinces Urban - Semi urban (cat 1&amp;2)</b>					<b>87,984</b>	<b>977</b>
Salary enumerators	2	12	days	2,700	64,800	
Taxes enumerators (8%)	2	12	days	216	5,184	
Salary Supervisor	0	12	days	3,500	0	
Taxes Supervisor (8%)	0	12	days	280	0	
Perdiem enumerators	2	0	days	2,255	0	
Perdiem supervisor	1	0	days	10,000	0	
Transport (bus and taxi)	3	12	days	500	18,000	
Air fare	0	1	trip	20,000	0	
<b>Other province (category 3) – closed rural</b>					<b>87,984</b>	<b>977</b>
Salary enumerators	2	12	days	2,700	64,800	
Taxes enumerators (8%)	2	12	days	216	5,184	
Salary Supervisor	0	12	days	3,500	0	
Taxes Supervisor (8%)	0	12	days	280	0	
Perdiem enumerators	2	0	days	2,255	0	
Perdiem supervisor	1	0	days	10,000	0	
Transport (bus and taxi)	3	12	days	500	18,000	
Air fare	0	1	trip	20,000	0	
<b>Other Province (category 4) – Far away rural</b>					<b>181,164</b>	<b>2,011</b>
Salary enumerators	2	12	days	2,700	64,800	
Taxes enumerators (8%)	2	12	days	216	5,184	
Salary Supervisor	0	12	days	3,500	0	
Taxes Supervisor (8%)	0	12	days	280	0	
Perdiem enumerators	2	12	days	2,255	54,120	
Perdiem supervisor	1	12	days	2,255	27,060	
Transport (bus and taxi)	3	12	days	500	18,000	
Transport (pick up)	3	1	trip	4,000	12,000	
Air fare	0	1	trip	20,000	0	
<b>Other Province (category 5) – other island</b>					<b>229,164</b>	<b>2,544</b>
Salary enumerators	2	12	days	2,700	64,800	
Taxes enumerators (8%)	2	12	days	216	5,184	
Salary Supervisor	0	12	days	3,500	0	
Taxes Supervisor (8%)	0	12	days	280	0	
Perdiem enumerators	2	12	days	2,255	54,120	
Perdiem supervisor	1	12	days	2,255	27,060	
Transport (bus and taxi)	3	12	days	500	18,000	
Transport (pick up)	0	1	trip	4,000	0	
Air fare	3	1	trip	20,000	60,000	





### APPENDIX 3 – planning of the collection

	from	to	Team 1 - Torba	Team 2 - Sanma	Team 3 - Penama	Team 4 - Malampa
training	16/01/2012	29/01/2012				
round 1	30/01/2012	12/02/2012				
round 2	13/02/2012	26/02/2012	training in Luganville			
round 3	27/02/2012	11/03/2012	EA 516-01 / Vanua Lava	Urban Santo 901-01 / 902-01	EA 395-00 / near rural Ambae	EA 623-01 / Malakula near rural
round 4	12/03/2012	25/03/2012		EA 401-03 / near rural Santo		
round 5	26/03/2012	8/04/2012		Urban Santo 929-01 / 929-02		
round 6	9/04/2012	22/04/2012			EA 386-00 / Meawo	EA 292 - Far rural Malakula
round 7	23/04/2012	6/05/2012		EA 453-01 / far rural Santo	EA 387-00 / Maewo	
round 8	7/05/2012	20/05/2012		EA 438-00 / far rural Santo		
round 9	21/05/2012	3/06/2012	EA 523-03 / Mota Lava	EA 481-00 / Malo		EA 266-00 / Malakula near rural
round 10	4/06/2012	17/06/2012		Urban Santo 903-01 / 904-00	EA 622-00 / Pentecost	
round 11	18/06/2012	1/07/2012		EA 461-04 / far rural Santo	EA 618-00 / Pentecost	
round 12	2/07/2012	15/07/2012			EA 596-00 / Pentecost	EA 274-00 / Malakula near rural
round 13	16/07/2012	29/07/2012		Peri urban Santo 418-01		EA 278-00 / Malakula near rural
BREAK	30/07/2012	12/08/2012	INDEPENDANCE ANNIVERSARY			
round 14	13/08/2012	26/08/2012		Urban Santo 924-00 / 925-01	EA 002-00 / near rural Ambae	
round 15	27/08/2012	9/09/2012		Peri urban Santo - 463-02		
round 16	10/09/2012	23/09/2012	EA 515-01 / Vanua Lava	Urban Santo 910-02 / 910-03		
round 17	24/09/2012	7/10/2012		EA 428-01 / far rural Santo		EA 221-00 / Ambrym
round 18	8/10/2012	21/10/2012		EA 427-00 / far rural Santo	EA 363-00 / far rural Ambae	EA 238-00 / Ambrym
round 19	22/10/2012	4/11/2012			EA 353-02 / far rural Ambae	EA 210-00 / Paama
round 20	5/11/2012	18/11/2012		Peri urban Santo - 420-02		
round 21	19/11/2012	2/12/2012		Urban Santo 926-00 / 916-00		EA 276-02 / Malakula near rural
round 22	3/12/2012	16/12/2012	EA 527-00 / Gaua	Urban Santo 930-02 / 930-03		
BREAK	17/12/2012	6/01/2013	CHRISTMAS			
round 23	7/01/2013	20/01/2013		Urban Santo 909-00 / 920-02	EA 315-00 / Pentecost	EA 308-00 / Far rural Malakula
round 24	21/01/2013	3/02/2013		EA 416-00 / far rural Santo	EA 313-00 / Pentecost	EA 309-00 / Far rural Malakula
round 25	4/02/2013	17/02/2013		EA 417-02 / far rural Santo	EA 314-00 / Pentecost	EA 574-00 / Malakula near rural



	from	to	Team 5.1 - Shefa	Team 5.2 - Shefa	Team 6 - Tafea
training	16/01/2012	29/01/2012	training in Port Vila		
round 1	30/01/2012	12/02/2012	Urban Efate 801-01 801-02	Urban Efate 829-00 831-00	EA 008-02 / Tanna near rural
round 2	13/02/2012	26/02/2012	Peri urban Efate 712-03	EA 709-02 / Efate far rural	
round 3	27/02/2012	11/03/2012	Urban Efate 801-04 801-05	Urban Efate 835-04 835-14	
round 4	12/03/2012	25/03/2012	Urban Efate 801-06 801-07	Peri urban Efate 715-03	Ea 026-00 / Tanna far rural
round 5	26/03/2012	8/04/2012	Peri urban Efate 721-00	Urban Efate 835-19 835-15	EA 040-00 / Tanna far rural
round 6	9/04/2012	22/04/2012	Urban Efate 801-08 801-09	Urban Efate 835-22 836-01	
round 7	23/04/2012	6/05/2012	Urban Efate 801-10 801-11	Peri urban Efate 715-11	
round 8	7/05/2012	20/05/2012		Urban Efate 836-03 837-03	EA 104-00 / Erromango
round 9	21/05/2012	3/06/2012	Urban Efate 801-14 801-16		
round 10	4/06/2012	17/06/2012	EA 112-01 / Epi	Urban Efate 838-01 838-02	
round 11	18/06/2012	1/07/2012	EA 111-02 / Epi	Peri urban Efate 716-05	
round 12	2/07/2012	15/07/2012	Urban Efate 801-17 803-02	Urban Efate 838-03 839-00	
round 13	16/07/2012	29/07/2012	Urban Efate 807-01 807-02	EA 184-00 / Tongoa	
BREAK	30/07/2012	12/08/2012	INDEPENDANCE ANNIVERSARY		
round 14	13/08/2012	26/08/2012	Urban Efate 804-01 806-02	Urban Efate 840-01 840-02	
round 15	27/08/2012	9/09/2012	Peri urban Efate 719-04	Urban Efate 840-03 840-05	EA 079-00 / Tanna far rural
round 16	10/09/2012	23/09/2012	Urban Efate 809-01 809-02	Peri urban Efate 717-02	EA 031-00 / Tanna far rural
round 17	24/09/2012	7/10/2012		Urban Efate 840-06 840-07	EA 095-00 / Tanna far rural
round 18	8/10/2012	21/10/2012	Urban Efate 809-03 809-04		
round 19	22/10/2012	4/11/2012	Peri urban Efate 713-01	Urban Efate 840-15 841-01	
round 20	5/11/2012	18/11/2012	Urban Efate 810-02 813-00	Peri urban Efate 718-02	EA 122-00 / Tanna near rural
round 21	19/11/2012	2/12/2012	EA 707-04 / Efate far rural	Urban Efate 843-01 843-04	
round 22	3/12/2012	16/12/2012	Urban Efate 823-01 824-01	Urban Efate 843-05 843-06	
BREAK	17/12/2012	6/01/2013	CHRISTMAS BREAK		
round 23	7/01/2013	20/01/2013	Peri urban Efate 712-10	Urban Efate 840-08 840-13	
round 24	21/01/2013	3/02/2013	Urban Efate 826-00 827-01	Urban Efate 844-00 843-07	
round 25	4/02/2013	17/02/2013			

Decomposition of 1 round of survey per 1 enumerator

DAY NUMBER									
1	2	3	4	5	6	7	8	9	
	1	2	3	4	5	6	7		
1	2	3	4	5	6	7			
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	
HH1	HH4	HH1	HH4	HH1	HH4	Rest	HH1	HH4	
HH2	HH5	HH2	HH5	HH2	HH5		HH2	HH5	
HH3	HH6	HH3	HH6	HH3	HH6		HH3	HH6	
Visit1		Visit2		Visit3			Visit4		
									
- Module1 - Diary presentation - Diary first day to fill		- Module2 - Diary check		- Module3 - Diary check			- Module4 & 5 - Last diary checks - Final global checks		
HH1 to 3 = 7 days of diary									
	HH4 to 6 = 7 days of diary								