

The utilization of untapped springs for Level II systems was given priority during Phase I period for rural water supply. At the time of this plan preparation, eight (8) untapped springs in six (6) municipalities were identified.

(2) Phase II requirements

Additional service coverage was estimated as a shortfall of the population to be served in Phase II comparing with the population served in Phase I. In this regard, existing facilities in rural area were assumed to be utilized through the two Phases, while urban population served by Level I and II facilities in base year was assumed to be absorbed by Level III service during Phase II period.

Table 8.5.1 exhibits the population to be served by target year, while Figures 8.5.1 and 8.5.2 present maps showing service coverage by 2000 and 2010, respectively (details are referred to Supporting Report).

Through the Phase I development, approximately 101,600 persons in the province will be served by additional water supply services, of which 19,100 persons or 19% of the total will be urban population and 82,500 persons or 81% will be rural population.

In the Phase II period, a total of 201,600 persons, of which 110,700 persons or 55% in urban area and 45,900 persons or 45% in rural area, will be further benefited by water supply services. This additional service coverage in urban area includes upgrade of service level for 83,600 persons served by Level I and II facilities in 1995.

8.5.2 Sanitation

(1) Household toilets

The service coverage (number of households to be served) by different types of sanitary facility is estimated by urban and rural area by municipality for the years 2000 and 2010.

The future service coverage and additional households to be served are estimated to meet the provincial targets using the number of household served in the base year and the number of households in target years.

Additional number of households to be served by different type of facility by urban and rural area by municipality is the shortfall of the number of households to be served in

Table 8.5.1. Population to be Served by Target Year (Water Supply)

| Municipalities | Type | Phase I (2000) | | | | | | | | | | Phase II (2010) | | | | | | | | | |
|----------------|-------|------------------|----------|------------------|-----------|----------|------------------------------------|-----------|----------|------------------|-----------|------------------|---------|-----------|------------------------------------|---------|-----------|----------|---------|-------|--|
| | | Total Population | | Service Coverage | | | Additional Population to be Served | | | Total Population | | Service Coverage | | | Additional Population to be Served | | | Total | | | |
| | | Level III | Level II | Level I | Level III | Level II | Level I | Level III | Level II | Level I | Level III | Level II | Level I | Level III | Level II | Level I | Level III | Level II | Level I | Total | |
| Alilem | Urban | 1,492 | 363 | 0 | 905 | 1,268 | 363 | 0 | 363 | 1,648 | 1,566 | 0 | 1,566 | 1,203 | 0 | 0 | 1,203 | 0 | 0 | 1,203 | |
| | Rural | 4,556 | 0 | 0 | 3,873 | 3,873 | 2,115 | 2,115 | 2,115 | 5,033 | 0 | 0 | 4,781 | 4,781 | 0 | 0 | 4,781 | 0 | 0 | 4,781 | |
| | Total | 6,048 | 363 | 0 | 4,778 | 5,141 | 363 | 2,115 | 2,478 | 6,681 | 1,566 | 0 | 4,781 | 6,347 | 1,203 | 0 | 908 | 2,115 | 0 | 908 | |
| Banayoyo | Urban | 865 | 50 | 0 | 685 | 735 | 50 | 0 | 50 | 955 | 907 | 0 | 907 | 857 | 0 | 0 | 857 | 0 | 0 | 857 | |
| | Rural | 5,829 | 0 | 0 | 4,945 | 4,955 | 0 | 0 | 326 | 6,439 | 0 | 0 | 6,117 | 6,117 | 0 | 0 | 6,117 | 0 | 0 | 6,117 | |
| | Total | 6,694 | 50 | 0 | 5,640 | 5,690 | 50 | 0 | 326 | 7,394 | 907 | 0 | 6,117 | 7,024 | 857 | 0 | 1,162 | 2,019 | 0 | 1,162 | |
| Bantay | Urban | 10,682 | 3,060 | 0 | 6,020 | 9,080 | 1,910 | 0 | 1,910 | 11,800 | 11,210 | 0 | 11,210 | 8,150 | 0 | 0 | 8,150 | 0 | 0 | 8,150 | |
| | Rural | 19,079 | 3,740 | 0 | 12,467 | 16,217 | 0 | 0 | 3,006 | 21,075 | 3,740 | 0 | 16,271 | 20,021 | 0 | 0 | 3,804 | 3,804 | 0 | 3,804 | |
| | Total | 29,761 | 6,810 | 0 | 18,487 | 25,297 | 1,910 | 0 | 3,006 | 32,875 | 14,980 | 0 | 16,271 | 31,231 | 8,150 | 0 | 3,804 | 11,954 | 0 | 3,804 | |
| Burgos | Urban | 1,580 | 444 | 0 | 899 | 1,343 | 444 | 0 | 444 | 1,745 | 1,658 | 0 | 1,658 | 1,214 | 0 | 0 | 1,214 | 0 | 0 | 1,214 | |
| | Rural | 9,302 | 0 | 0 | 6,412 | 7,907 | 0 | 0 | 520 | 10,275 | 0 | 0 | 10,275 | 9,761 | 0 | 0 | 9,761 | 0 | 0 | 9,761 | |
| | Total | 10,882 | 444 | 0 | 7,311 | 9,250 | 444 | 0 | 520 | 12,020 | 1,658 | 0 | 10,275 | 11,419 | 0 | 0 | 1,854 | 1,854 | 0 | 1,854 | |
| Cabugao | Urban | 8,361 | 850 | 0 | 6,336 | 7,186 | 0 | 0 | 0 | 9,226 | 8,774 | 0 | 8,774 | 7,924 | 0 | 0 | 7,924 | 0 | 0 | 7,924 | |
| | Rural | 21,367 | 1,710 | 0 | 18,152 | 19,862 | 0 | 0 | 698 | 25,811 | 1,710 | 0 | 22,810 | 24,520 | 0 | 0 | 4,658 | 4,658 | 0 | 4,658 | |
| | Total | 31,728 | 2,560 | 0 | 24,488 | 27,048 | 0 | 0 | 698 | 35,047 | 10,484 | 0 | 22,810 | 33,294 | 7,924 | 0 | 4,658 | 12,882 | 0 | 4,658 | |
| Candon | Urban | 7,647 | 1,940 | 0 | 4,560 | 6,500 | 1,940 | 0 | 1,940 | 8,447 | 8,025 | 0 | 8,025 | 6,085 | 0 | 0 | 6,085 | 0 | 0 | 6,085 | |
| | Rural | 42,356 | 0 | 0 | 35,453 | 36,003 | 0 | 0 | 0 | 46,788 | 0 | 0 | 46,788 | 44,449 | 0 | 0 | 8,446 | 8,446 | 0 | 8,446 | |
| | Total | 50,003 | 1,940 | 0 | 40,013 | 42,503 | 1,940 | 0 | 1,940 | 55,235 | 8,025 | 0 | 43,899 | 52,447 | 6,085 | 0 | 8,446 | 14,531 | 0 | 8,446 | |
| Caoayan | Urban | 7,179 | 1,823 | 0 | 4,279 | 6,102 | 1,193 | 0 | 1,193 | 7,930 | 7,534 | 0 | 7,534 | 5,711 | 0 | 0 | 5,711 | 0 | 0 | 5,711 | |
| | Rural | 10,261 | 1,700 | 0 | 7,022 | 8,722 | 0 | 0 | 2,855 | 11,335 | 1,700 | 0 | 9,068 | 10,768 | 0 | 0 | 2,046 | 2,046 | 0 | 2,046 | |
| | Total | 17,440 | 3,523 | 0 | 11,301 | 14,824 | 1,193 | 0 | 2,855 | 19,265 | 9,234 | 0 | 9,068 | 18,302 | 5,711 | 0 | 4,092 | 4,092 | 0 | 4,092 | |
| Cervantes | Urban | 2,759 | 482 | 0 | 1,863 | 2,345 | 482 | 0 | 482 | 3,048 | 2,806 | 0 | 2,806 | 2,447 | 0 | 0 | 2,447 | 0 | 0 | 2,447 | |
| | Rural | 12,273 | 482 | 0 | 10,432 | 10,432 | 0 | 0 | 1,369 | 13,557 | 0 | 0 | 12,879 | 12,879 | 0 | 0 | 2,447 | 2,447 | 0 | 2,447 | |
| | Total | 15,032 | 964 | 0 | 12,295 | 12,777 | 482 | 0 | 1,369 | 16,605 | 2,806 | 0 | 12,879 | 15,775 | 2,414 | 0 | 2,447 | 4,894 | 0 | 2,447 | |
| Galimuyod | Urban | 455 | 12 | 0 | 375 | 387 | 12 | 0 | 12 | 503 | 478 | 0 | 478 | 466 | 0 | 0 | 466 | 0 | 0 | 466 | |
| | Rural | 8,777 | 0 | 0 | 7,460 | 7,460 | 0 | 0 | 49 | 9,695 | 0 | 0 | 9,210 | 9,210 | 0 | 0 | 1,750 | 1,750 | 0 | 1,750 | |
| | Total | 9,232 | 12 | 0 | 7,835 | 7,847 | 12 | 0 | 61 | 10,198 | 478 | 0 | 9,210 | 9,688 | 466 | 0 | 1,750 | 2,216 | 0 | 1,750 | |
| G. del Pilar | Urban | 642 | 600 | 0 | 0 | 600 | 0 | 0 | 0 | 709 | 674 | 0 | 674 | 74 | 0 | 0 | 74 | 0 | 0 | 74 | |
| | Rural | 3,165 | 800 | 0 | 1,407 | 2,757 | 0 | 0 | 0 | 3,406 | 800 | 0 | 3,406 | 3,321 | 0 | 0 | 564 | 564 | 0 | 564 | |
| | Total | 3,807 | 1,400 | 0 | 1,407 | 3,357 | 0 | 0 | 0 | 4,205 | 1,474 | 0 | 3,995 | 3,995 | 74 | 0 | 638 | 638 | 0 | 638 | |
| Lalidda | Urban | 1,319 | 0 | 0 | 1,129 | 1,129 | 0 | 0 | 0 | 1,457 | 1,384 | 0 | 1,384 | 1,384 | 0 | 0 | 1,384 | 0 | 0 | 1,384 | |
| | Rural | 2,897 | 0 | 0 | 2,462 | 2,462 | 0 | 0 | 0 | 3,300 | 0 | 0 | 3,040 | 3,040 | 0 | 0 | 578 | 578 | 0 | 578 | |
| | Total | 4,216 | 0 | 0 | 3,591 | 3,591 | 0 | 0 | 0 | 4,757 | 1,384 | 0 | 4,424 | 4,424 | 1,384 | 0 | 1,962 | 1,962 | 0 | 1,962 | |
| Magungul | Urban | 5,583 | 538 | 0 | 4,208 | 4,746 | 538 | 0 | 538 | 6,167 | 5,850 | 0 | 5,850 | 5,321 | 0 | 0 | 5,321 | 0 | 0 | 5,321 | |
| | Rural | 19,805 | 0 | 0 | 16,104 | 16,834 | 0 | 0 | 530 | 21,877 | 0 | 0 | 20,253 | 20,783 | 0 | 0 | 3,949 | 3,949 | 0 | 3,949 | |
| | Total | 25,388 | 538 | 0 | 20,512 | 21,580 | 538 | 0 | 530 | 28,044 | 5,850 | 0 | 26,642 | 26,642 | 5,321 | 0 | 9,270 | 9,270 | 0 | 9,270 | |

Table 8.5.1 Population to be Served by Target Year (Water Supply) (Cont'd.)

| Municipalities | Type | Phase I (2000) | | | | | | | | | | Phase II (2010) | | | | | | | | | |
|----------------|-------|------------------|----------|---------|------------------|----------|---------|------------------------------------|----------|---------|------------------|-----------------|----------|------------------|--------|-----------|------------------------------------|---------|-------|--|--|
| | | Total Population | | | Service Coverage | | | Additional Population to be Served | | | Total Population | | | Service Coverage | | | Additional Population to be Served | | | | |
| | | Level III | Level II | Level I | Level III | Level II | Level I | Level III | Level II | Level I | Total | Level III | Level II | Level I | Total | Level III | Level II | Level I | Total | | |
| Nagbaki | Urban | 774 | 189 | 0 | 469 | 658 | 189 | 0 | 0 | 189 | 855 | 812 | 0 | 812 | 623 | 0 | 0 | 623 | | | |
| | Rural | 3,402 | 0 | 2,322 | 2,892 | 0 | 520 | 292 | 0 | 570 | 3,798 | 0 | 0 | 3,790 | 0 | 0 | 0 | 678 | | | |
| | Total | 4,176 | 189 | 2,791 | 3,550 | 189 | 520 | 292 | 1,001 | 4,613 | 3,812 | 0 | 0 | 4,382 | 623 | 0 | 0 | 1,301 | | | |
| Narvacan | Urban | 2,979 | 1,492 | 0 | 1,040 | 2,532 | 618 | 0 | 0 | 618 | 3,291 | 3,126 | 0 | 3,126 | 1,634 | 0 | 0 | 1,634 | | | |
| | Rural | 36,833 | 0 | 450 | 30,858 | 31,308 | 0 | 12,514 | 12,514 | 40,686 | 0 | 0 | 0 | 38,202 | 0 | 0 | 0 | 7,344 | | | |
| | Total | 39,812 | 1,492 | 450 | 31,898 | 33,840 | 618 | 12,514 | 13,132 | 43,977 | 3,126 | 0 | 0 | 41,778 | 1,634 | 0 | 0 | 8,978 | | | |
| Quirino | Urban | 1,461 | 222 | 1,020 | 0 | 1,242 | 222 | 0 | 0 | 222 | 1,614 | 1,533 | 0 | 1,533 | 1,311 | 0 | 0 | 1,311 | | | |
| | Rural | 6,383 | 0 | 3,816 | 1,610 | 5,426 | 0 | 1,590 | 1,610 | 3,300 | 7,051 | 0 | 0 | 3,816 | 2,882 | 0 | 0 | 1,272 | | | |
| | Total | 7,844 | 222 | 4,836 | 1,610 | 6,668 | 222 | 1,590 | 1,610 | 3,422 | 8,665 | 1,533 | 0 | 2,882 | 2,882 | 0 | 0 | 2,556 | | | |
| Salcedo | Urban | 1,422 | 173 | 0 | 1,036 | 1,209 | 173 | 0 | 0 | 173 | 1,571 | 1,492 | 0 | 1,492 | 1,319 | 0 | 0 | 1,319 | | | |
| | Rural | 9,155 | 0 | 0 | 7,782 | 7,782 | 0 | 1,138 | 1,138 | 10,113 | 0 | 0 | 0 | 9,607 | 0 | 0 | 0 | 1,825 | | | |
| | Total | 10,577 | 173 | 0 | 8,818 | 8,991 | 173 | 1,138 | 1,311 | 11,684 | 1,492 | 0 | 0 | 11,099 | 1,319 | 0 | 0 | 3,144 | | | |
| San Emilio | Urban | 2,436 | 0 | 0 | 2,141 | 2,141 | 0 | 0 | 0 | 0 | 2,691 | 2,556 | 0 | 2,556 | 2,556 | 0 | 0 | 2,556 | | | |
| | Rural | 4,341 | 0 | 0 | 3,690 | 3,690 | 0 | 127 | 127 | 4,795 | 0 | 0 | 0 | 4,555 | 0 | 0 | 0 | 865 | | | |
| | Total | 6,777 | 0 | 0 | 5,831 | 5,831 | 0 | 127 | 127 | 7,486 | 2,556 | 0 | 0 | 4,555 | 2,556 | 0 | 0 | 3,421 | | | |
| San Esteban | Urban | 795 | 103 | 255 | 318 | 676 | 103 | 0 | 0 | 103 | 878 | 834 | 0 | 834 | 731 | 0 | 0 | 731 | | | |
| | Rural | 6,382 | 0 | 149 | 5,276 | 5,425 | 0 | 1,506 | 1,506 | 7,050 | 0 | 0 | 149 | 6,549 | 6,698 | 0 | 0 | 1,273 | | | |
| | Total | 7,177 | 103 | 404 | 5,594 | 6,101 | 103 | 1,506 | 1,609 | 7,928 | 834 | 0 | 149 | 6,549 | 7,532 | 731 | 0 | 2,004 | | | |
| San Idelfonso | Urban | 1,083 | 119 | 0 | 802 | 921 | 119 | 0 | 0 | 119 | 1,196 | 1,136 | 0 | 1,136 | 1,017 | 0 | 0 | 1,017 | | | |
| | Rural | 4,280 | 0 | 0 | 3,638 | 3,638 | 0 | 528 | 528 | 4,728 | 0 | 0 | 0 | 4,492 | 4,492 | 0 | 0 | 854 | | | |
| | Total | 5,363 | 119 | 0 | 4,440 | 4,559 | 119 | 528 | 647 | 5,924 | 1,136 | 0 | 0 | 4,492 | 5,628 | 1,017 | 0 | 1,871 | | | |
| San Juan | Urban | 3,596 | 325 | 0 | 2,732 | 3,057 | 325 | 0 | 0 | 325 | 3,972 | 3,773 | 0 | 3,773 | 3,448 | 0 | 0 | 3,448 | | | |
| | Rural | 19,638 | 0 | 325 | 16,367 | 16,692 | 0 | 1,905 | 1,905 | 21,693 | 0 | 0 | 325 | 20,283 | 20,608 | 0 | 0 | 3,916 | | | |
| | Total | 23,234 | 325 | 325 | 19,099 | 19,749 | 325 | 1,905 | 2,230 | 25,665 | 3,773 | 0 | 325 | 20,283 | 24,381 | 3,448 | 0 | 7,364 | | | |
| San Vicente | Urban | 1,262 | 10 | 0 | 1,063 | 1,073 | 10 | 0 | 0 | 10 | 1,394 | 1,324 | 0 | 1,324 | 1,314 | 0 | 0 | 1,314 | | | |
| | Rural | 10,200 | 0 | 0 | 8,670 | 8,670 | 0 | 2,080 | 2,080 | 11,267 | 0 | 0 | 0 | 10,704 | 10,704 | 0 | 0 | 2,034 | | | |
| | Total | 11,462 | 10 | 0 | 9,733 | 9,743 | 10 | 2,080 | 2,090 | 12,661 | 1,324 | 0 | 0 | 10,704 | 12,028 | 1,314 | 0 | 3,348 | | | |
| Santa | Urban | 1,831 | 950 | 0 | 606 | 1,556 | 195 | 0 | 0 | 195 | 2,023 | 1,922 | 0 | 1,922 | 972 | 0 | 0 | 972 | | | |
| | Rural | 12,161 | 95 | 1,014 | 9,238 | 10,337 | 0 | 520 | 2,286 | 13,433 | 95 | 0 | 1,014 | 11,652 | 12,761 | 0 | 0 | 2,424 | | | |
| | Total | 13,992 | 1,045 | 1,014 | 9,834 | 11,893 | 195 | 520 | 2,286 | 3,001 | 15,456 | 2,017 | 1,014 | 11,652 | 14,683 | 972 | 0 | 2,424 | | | |
| Santa Catalina | Urban | 1,314 | 176 | 0 | 941 | 1,117 | 176 | 0 | 0 | 176 | 1,451 | 1,378 | 0 | 1,378 | 1,202 | 0 | 0 | 1,202 | | | |
| | Rural | 11,707 | 0 | 0 | 9,951 | 9,951 | 0 | 1,550 | 1,550 | 12,932 | 0 | 0 | 0 | 12,285 | 12,285 | 0 | 0 | 2,334 | | | |
| | Total | 13,021 | 176 | 0 | 10,892 | 11,068 | 176 | 1,550 | 1,550 | 14,383 | 1,378 | 0 | 0 | 12,285 | 13,663 | 1,202 | 0 | 2,334 | | | |
| Santa Cruz | Urban | 4,719 | 936 | 0 | 3,075 | 4,011 | 936 | 0 | 0 | 936 | 5,213 | 4,952 | 0 | 4,952 | 4,016 | 0 | 0 | 4,016 | | | |
| | Rural | 29,297 | 0 | 1,075 | 23,827 | 24,902 | 0 | 0 | 5,379 | 32,362 | 0 | 0 | 1,075 | 29,669 | 30,744 | 0 | 0 | 5,842 | | | |
| | Total | 34,016 | 936 | 1,075 | 26,902 | 28,913 | 936 | 0 | 5,379 | 37,575 | 4,952 | 0 | 1,075 | 29,669 | 35,696 | 4,016 | 0 | 9,858 | | | |

Table 8.5.1 Population to be Served by Target Year (Water Supply) (Cont'd.)

| Municipalities | Type | Phase I (2000) | | | | | | | | | | Phase II (2010) | | | | | | | | | |
|------------------|-------|------------------|----------|---------|------------------|----------|---------|------------------------------------|----------|---------|---------|------------------|----------|---------|------------------|-----------|----------|------------------------------------|-------|--|--|
| | | Total Population | | | Service Coverage | | | Additional Population to be Served | | | | Total Population | | | Service Coverage | | | Additional Population to be Served | | | |
| | | Level III | Level II | Level I | Level III | Level II | Level I | Level III | Level II | Level I | Total | Level III | Level II | Level I | Total | Level III | Level II | Level I | Total | | |
| Santa Lucia | Urban | 2,386 | 1,132 | 0 | 896 | 2,028 | 212 | 0 | 0 | 212 | 2,636 | 2,504 | 0 | 2,504 | 1,372 | 0 | 0 | 1,372 | | | |
| | Rural | 21,204 | 645 | 125 | 17,253 | 18,023 | 0 | 0 | 4,330 | 4,330 | 23,422 | 645 | 125 | 21,481 | 22,251 | 0 | 0 | 4,228 | | | |
| | Total | 23,590 | 1,777 | 125 | 18,149 | 20,051 | 212 | 0 | 4,330 | 4,542 | 26,058 | 3,149 | 125 | 21,481 | 24,755 | 1,372 | 0 | 4,228 | | | |
| Santa Maria | Urban | 3,855 | 1,330 | 0 | 1,947 | 3,277 | 1,330 | 0 | 1,330 | 4,607 | 4,258 | 4,045 | 0 | 4,045 | 2,715 | 0 | 0 | 2,715 | | | |
| | Rural | 22,788 | 250 | 0 | 19,120 | 19,370 | 0 | 0 | 7,862 | 7,862 | 25,172 | 250 | 0 | 23,663 | 23,913 | 0 | 0 | 4,543 | | | |
| | Total | 26,643 | 1,580 | 0 | 21,067 | 22,647 | 1,330 | 0 | 7,862 | 9,192 | 29,430 | 4,295 | 0 | 23,663 | 27,958 | 2,715 | 0 | 4,543 | | | |
| Santiago | Urban | 2,573 | 709 | 75 | 1,761 | 2,145 | 374 | 0 | 0 | 374 | 2,787 | 2,648 | 0 | 2,648 | 1,939 | 0 | 0 | 1,939 | | | |
| | Rural | 14,326 | 0 | 0 | 12,177 | 12,177 | 0 | 0 | 2,413 | 2,413 | 15,825 | 0 | 0 | 15,034 | 15,034 | 0 | 0 | 2,857 | | | |
| | Total | 16,899 | 709 | 75 | 13,538 | 14,322 | 374 | 0 | 2,413 | 2,787 | 18,612 | 2,648 | 0 | 15,034 | 17,882 | 1,939 | 0 | 2,857 | | | |
| Santo Domingo | Urban | 3,122 | 311 | 0 | 2,343 | 2,654 | 286 | 0 | 0 | 286 | 3,449 | 3,277 | 0 | 3,277 | 2,966 | 0 | 0 | 2,966 | | | |
| | Rural | 20,574 | 10 | 475 | 17,003 | 17,488 | 0 | 0 | 1,224 | 1,224 | 22,726 | 10 | 475 | 21,105 | 21,590 | 0 | 0 | 4,102 | | | |
| | Total | 23,696 | 321 | 475 | 19,346 | 20,142 | 286 | 0 | 1,224 | 1,510 | 26,175 | 3,287 | 475 | 21,105 | 24,867 | 2,966 | 0 | 4,102 | | | |
| Sugay | Urban | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| | Rural | 2,207 | 0 | 1,625 | 455 | 2,080 | 0 | 0 | 0 | 0 | 2,438 | 0 | 1,625 | 691 | 2,316 | 0 | 0 | 236 | | | |
| | Total | 2,207 | 0 | 1,625 | 455 | 2,080 | 0 | 0 | 0 | 0 | 2,438 | 0 | 1,625 | 691 | 2,316 | 0 | 0 | 236 | | | |
| Sinar | Urban | 3,058 | 995 | 0 | 1,896 | 2,891 | 0 | 0 | 0 | 0 | 3,378 | 3,209 | 0 | 3,209 | 2,214 | 0 | 0 | 2,214 | | | |
| | Rural | 21,590 | 0 | 0 | 18,343 | 18,343 | 0 | 0 | 2,329 | 2,329 | 23,838 | 0 | 0 | 22,646 | 22,646 | 0 | 0 | 4,303 | | | |
| | Total | 24,638 | 995 | 0 | 20,239 | 21,234 | 0 | 0 | 2,329 | 2,329 | 27,216 | 3,209 | 0 | 22,646 | 25,855 | 2,214 | 0 | 4,303 | | | |
| Sugpon | Urban | 1,032 | 0 | 225 | 690 | 915 | 0 | 0 | 0 | 0 | 1,140 | 1,083 | 0 | 1,083 | 1,083 | 0 | 0 | 1,083 | | | |
| | Rural | 1,915 | 0 | 1,175 | 453 | 1,628 | 0 | 0 | 453 | 453 | 2,115 | 0 | 1,175 | 834 | 2,009 | 0 | 0 | 381 | | | |
| | Total | 2,947 | 0 | 1,400 | 1,143 | 2,543 | 0 | 0 | 453 | 453 | 3,255 | 1,083 | 1,175 | 834 | 3,092 | 1,083 | 0 | 381 | | | |
| Suyo | Urban | 1,894 | 335 | 1,275 | 0 | 1,610 | 335 | 0 | 0 | 335 | 2,092 | 1,987 | 0 | 1,987 | 1,652 | 0 | 0 | 1,652 | | | |
| | Rural | 7,454 | 0 | 4,700 | 1,636 | 6,336 | 0 | 0 | 1,342 | 1,342 | 8,234 | 0 | 4,700 | 3,122 | 7,822 | 0 | 0 | 1,486 | | | |
| | Total | 9,348 | 335 | 5,975 | 1,636 | 7,946 | 335 | 0 | 1,342 | 1,677 | 10,326 | 1,987 | 4,700 | 3,122 | 9,409 | 1,652 | 0 | 1,486 | | | |
| Tagudin | Urban | 5,133 | 2,689 | 0 | 1,674 | 4,363 | 29 | 0 | 0 | 29 | 5,670 | 5,387 | 0 | 5,387 | 2,698 | 0 | 0 | 2,698 | | | |
| | Rural | 29,567 | 2,555 | 675 | 21,902 | 25,132 | 0 | 0 | 3,223 | 3,223 | 32,660 | 2,555 | 675 | 27,797 | 31,027 | 0 | 0 | 5,895 | | | |
| | Total | 34,700 | 5,244 | 675 | 23,576 | 29,495 | 29 | 0 | 3,223 | 3,252 | 38,310 | 7,942 | 675 | 27,797 | 36,414 | 2,698 | 0 | 5,895 | | | |
| Vigan (Capital) | Urban | 43,796 | 12,802 | 0 | 24,425 | 37,227 | 6,502 | 0 | 0 | 6,502 | 48,378 | 45,959 | 0 | 45,959 | 33,157 | 0 | 0 | 33,157 | | | |
| | Rural | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48,378 | 45,959 | 0 | 45,959 | 33,157 | 0 | 0 | 0 | | | |
| | Total | 43,796 | 12,802 | 0 | 24,425 | 37,227 | 6,502 | 0 | 0 | 6,502 | 48,378 | 45,959 | 0 | 45,959 | 33,157 | 0 | 0 | 33,157 | | | |
| Provincial Total | Urban | 139,035 | 35,160 | 2,850 | 80,714 | 118,724 | 19,066 | 0 | 0 | 19,066 | 153,582 | 145,902 | 0 | 145,902 | 110,742 | 0 | 0 | 110,742 | | | |
| | Rural | 457,061 | 11,515 | 19,299 | 357,960 | 388,774 | 0 | 3,680 | 78,883 | 82,563 | 504,879 | 11,515 | 19,299 | 448,818 | 479,632 | 0 | 0 | 90,855 | | | |
| | Total | 596,096 | 46,675 | 22,149 | 438,674 | 507,498 | 19,066 | 3,680 | 78,883 | 101,629 | 658,461 | 157,417 | 19,299 | 448,818 | 655,434 | 110,742 | 0 | 90,855 | | | |

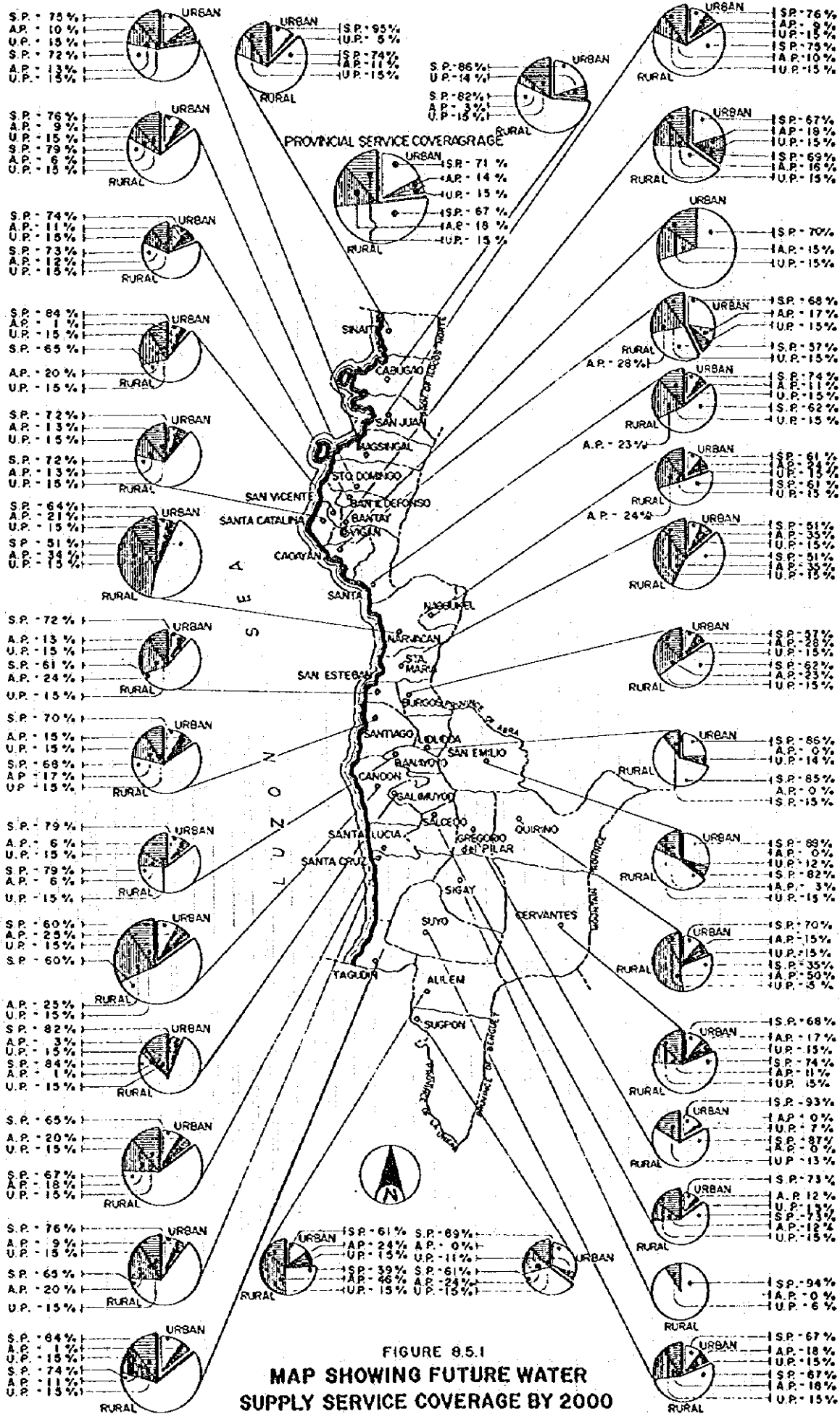


FIGURE 8.5.1
**MAP SHOWING FUTURE WATER
 SUPPLY SERVICE COVERAGE BY 2000**

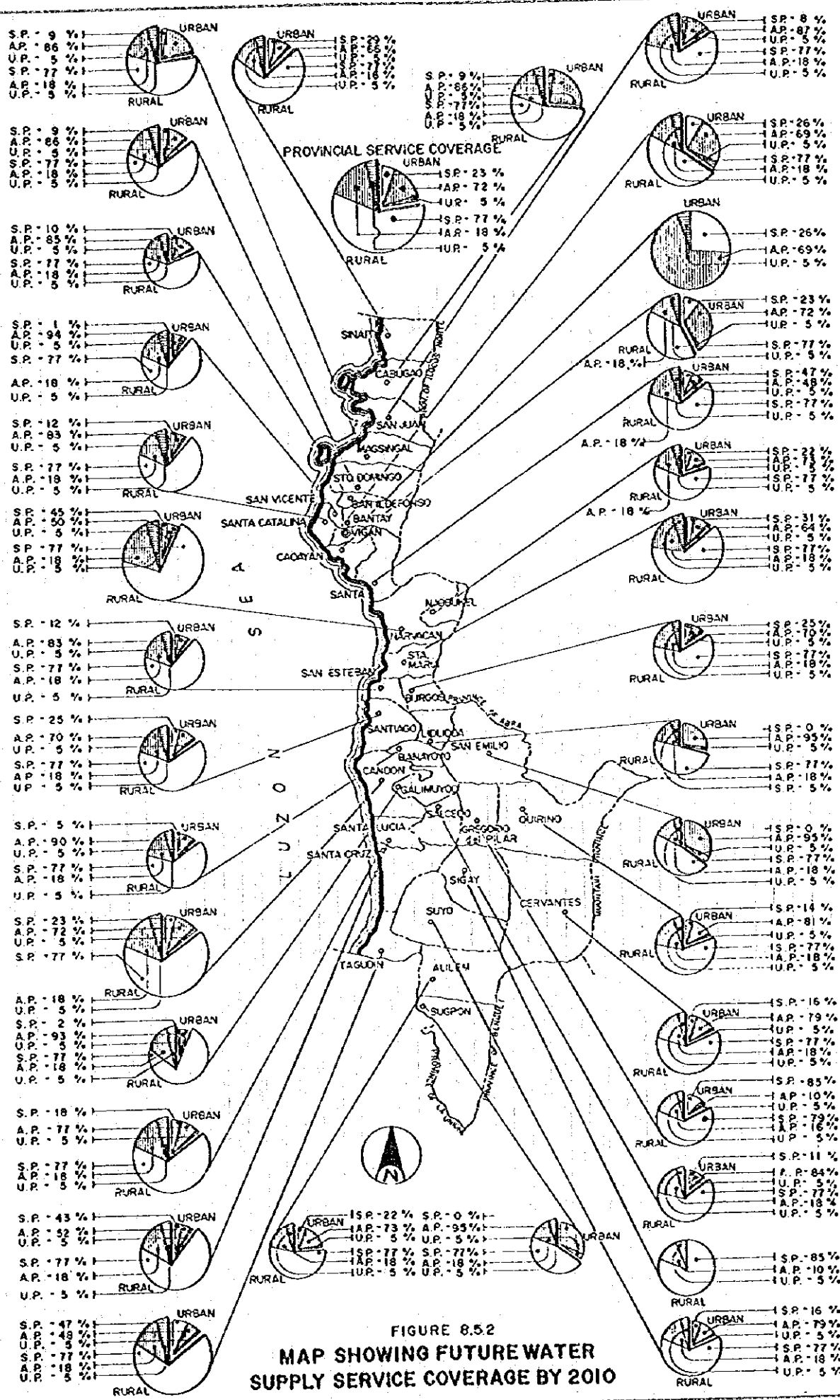


FIGURE 8.52
**MAP SHOWING FUTURE WATER
 SUPPLY SERVICE COVERAGE BY 2010**

target years comparing with either that in base year or in Phase I (details are referred to Supporting Report). However, when the number of households to be served in target year/s is less than or equal to that in base year, no additional number of households to be served is counted.

In the determination of the number of households to be served by flush type toilet, when the number of households to be served in the target year is bigger than in base year, the target coverage is applied with conditions. When the target coverage is bigger than Level III water supply coverage, the latter coverage is adopted, while in the other case, the target coverage is applied. In cases where the target coverage is less than that in base year, the base year coverage is adopted.

For Phase I, any type of existing facilities both in urban and rural areas is to be utilized during Phase I period. For Phase II, water-sealed toilet facilities in Phase I both in urban and rural areas are to be utilized.

The projected number of served households at the end of the Phase I period is 106,171. The additional households to be served totaled to 14,643, of which 20% is urban households and 80% is rural households. While at the end of Phase II period, the number of served households is 156,397. The additional households to be served are 57,162.

Table 8.5.2 summarizes the number of households to be served by target year for urban and rural areas by municipality. Figures 8.5.3 and 8.5.4 present maps showing service coverage by 2000 and 2010, respectively.

(2) School toilets

The service coverage (number of public school students to be served) is estimated by municipality for the years 2000 and 2010.

The future service coverage and additional number of students to be served are estimated using the number of students served in the base year, the number of students in target years and the provincial sector targets.

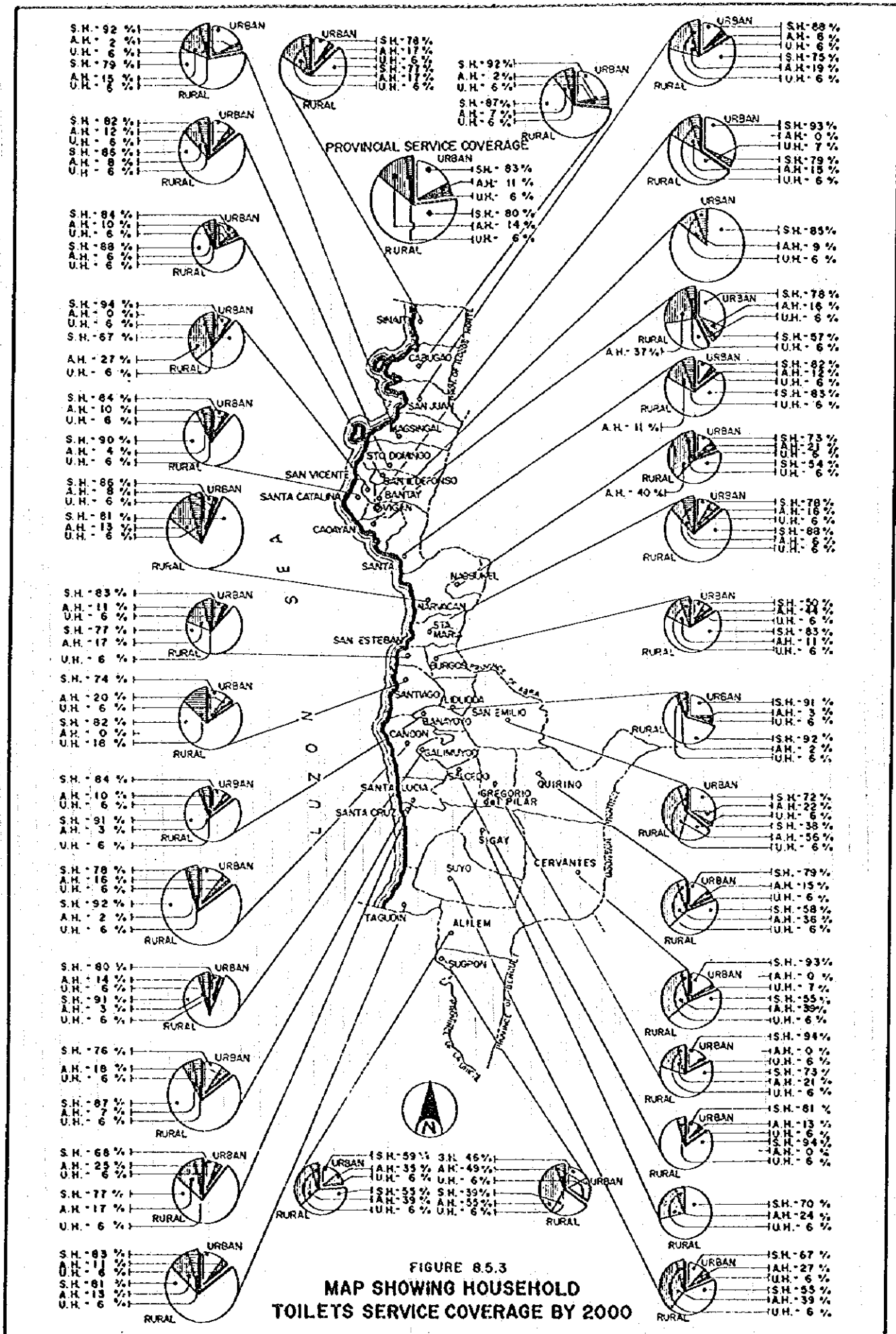
Additional number of students to be served by municipality is the shortfall of the number of students to be served in targets comparing with either that in base year or in Phase I

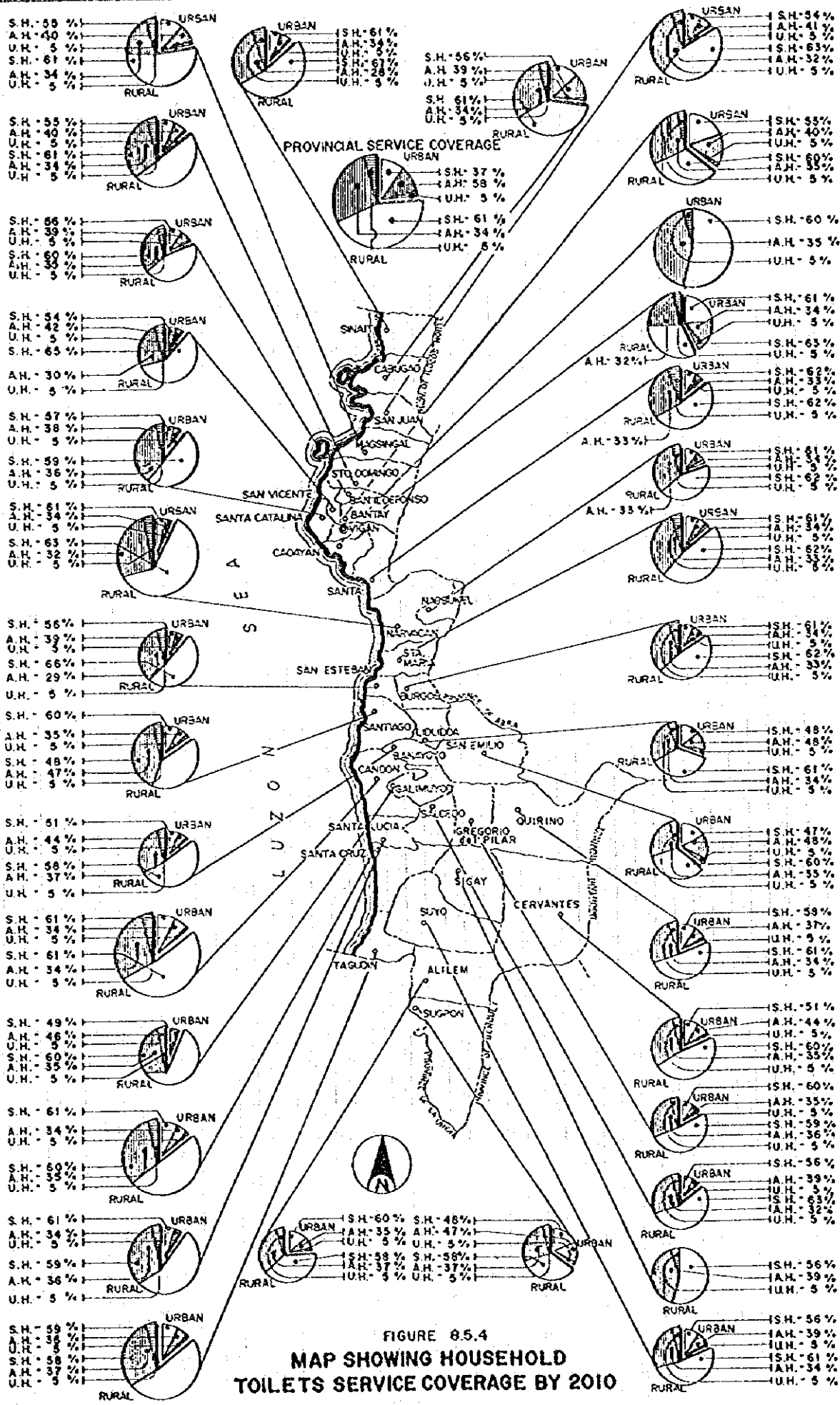
Table 8.5.2 Additional Number of Households to be Served by Target Year (Household Toilets) (Cont'd.)

| Municipality | Area | Phase I (2000) | | | | | | Phase II (2010) | | | | | | | | | | |
|----------------|-------|------------------|-------------|------------|--------------------------|------------|-------------|------------------|-------------|------------|--------------------------|------------|-------------|--------|-------|-------|-------|-----|
| | | Total Households | | | No. of Served Households | | | Total Households | | | No. of Served Households | | | | | | | |
| | | Total | VIP Latrine | Pour Flush | Total | Pour Flush | VIP Latrine | Total | VIP Latrine | Pour Flush | Total | Pour Flush | VIP Latrine | | | | | |
| Nagbukul | Urban | 152 | 7 | 145 | 29 | 107 | 0 | 25 | 120 | 214 | 102 | 101 | 0 | 203 | 73 | 0 | 73 | |
| | Rural | 654 | 31 | 615 | 0 | 584 | 0 | 257 | 8 | 265 | 0 | 893 | 0 | 893 | 0 | 309 | 0 | |
| | Total | 806 | 38 | 758 | 29 | 691 | 38 | 257 | 15 | 297 | 1,154 | 102 | 994 | 0 | 1,096 | 73 | 309 | 0 |
| Narvacan | Urban | 573 | 27 | 539 | 108 | 404 | 0 | 823 | 391 | 391 | 0 | 782 | 283 | 0 | 0 | 0 | 283 | 0 |
| | Rural | 7,222 | 369 | 6,789 | 360 | 6,090 | 0 | 566 | 339 | 905 | 10,172 | 9,303 | 0 | 9,863 | 0 | 3,213 | 0 | |
| | Total | 7,795 | 366 | 7,324 | 468 | 6,494 | 366 | 566 | 366 | 950 | 10,995 | 9,594 | 0 | 10,445 | 0 | 3,213 | 0 | |
| Quirine | Urban | 286 | 43 | 269 | 0 | 213 | 0 | 42 | 0 | 42 | 1,763 | 0 | 1,675 | 0 | 384 | 149 | 0 | 149 |
| | Rural | 1,204 | 57 | 1,132 | 0 | 1,075 | 0 | 435 | 0 | 435 | 2,167 | 1,867 | 0 | 2,059 | 149 | 600 | 0 | |
| | Total | 1,490 | 43 | 1,401 | 43 | 1,288 | 0 | 477 | 0 | 477 | 2,167 | 1,867 | 0 | 2,059 | 149 | 600 | 0 | |
| Salcedo | Urban | 290 | 35 | 273 | 0 | 224 | 0 | 30 | 0 | 30 | 393 | 187 | 186 | 0 | 373 | 152 | 0 | 152 |
| | Rural | 1,795 | 84 | 1,687 | 19 | 1,584 | 0 | 0 | 0 | 0 | 2,528 | 19 | 2,383 | 0 | 2,402 | 0 | 799 | 0 |
| | Total | 2,085 | 98 | 1,960 | 30 | 1,808 | 0 | 30 | 0 | 30 | 2,921 | 206 | 2,569 | 0 | 2,772 | 152 | 799 | 0 |
| San Emilio | Urban | 443 | 21 | 416 | 0 | 395 | 0 | 99 | 0 | 99 | 673 | 320 | 319 | 0 | 639 | 320 | 0 | 320 |
| | Rural | 804 | 38 | 756 | 0 | 718 | 0 | 411 | 38 | 449 | 1,199 | 0 | 1,130 | 0 | 1,139 | 0 | 421 | 0 |
| | Total | 1,247 | 59 | 1,172 | 0 | 1,113 | 0 | 510 | 38 | 548 | 1,872 | 320 | 1,458 | 0 | 1,778 | 320 | 421 | 0 |
| San Esteban | Urban | 156 | 7 | 147 | 0 | 147 | 0 | 10 | 0 | 10 | 230 | 104 | 104 | 0 | 209 | 85 | 0 | 85 |
| | Rural | 1,302 | 61 | 1,224 | 24 | 1,139 | 0 | 156 | 61 | 217 | 1,763 | 24 | 1,651 | 0 | 1,675 | 0 | 512 | 0 |
| | Total | 1,458 | 68 | 1,371 | 24 | 1,259 | 0 | 166 | 68 | 234 | 1,983 | 129 | 1,755 | 0 | 1,884 | 85 | 512 | 0 |
| San Ildefonso | Urban | 208 | 10 | 196 | 0 | 196 | 0 | 11 | 10 | 21 | 299 | 142 | 142 | 0 | 284 | 118 | 0 | 118 |
| | Rural | 793 | 37 | 745 | 0 | 745 | 0 | 11 | 37 | 48 | 1,182 | 17 | 1,106 | 0 | 1,123 | 0 | 415 | 0 |
| | Total | 1,001 | 47 | 941 | 0 | 941 | 0 | 22 | 47 | 69 | 1,481 | 159 | 1,248 | 0 | 1,407 | 118 | 415 | 0 |
| San Juan | Urban | 749 | 68 | 704 | 0 | 601 | 0 | 43 | 0 | 43 | 993 | 472 | 471 | 0 | 643 | 404 | 0 | 404 |
| | Rural | 3,851 | 181 | 3,620 | 0 | 3,265 | 0 | 554 | 181 | 735 | 5,423 | 174 | 4,978 | 0 | 5,152 | 0 | 1,713 | 0 |
| | Total | 4,600 | 216 | 4,324 | 43 | 3,866 | 0 | 597 | 181 | 778 | 6,416 | 646 | 5,449 | 0 | 6,095 | 404 | 1,713 | 0 |
| San Vicente | Urban | 234 | 11 | 220 | 0 | 188 | 0 | 0 | 0 | 11 | 349 | 166 | 166 | 0 | 332 | 145 | 0 | 145 |
| | Rural | 2,040 | 96 | 1,918 | 0 | 1,742 | 0 | 542 | 0 | 542 | 2,817 | 80 | 2,596 | 0 | 2,676 | 0 | 854 | 0 |
| | Total | 2,274 | 107 | 2,118 | 0 | 1,930 | 0 | 542 | 0 | 543 | 3,166 | 246 | 2,762 | 0 | 3,008 | 145 | 854 | 0 |
| Santa | Urban | 381 | 72 | 368 | 18 | 368 | 44 | 0 | 0 | 44 | 506 | 240 | 241 | 0 | 481 | 168 | 0 | 168 |
| | Rural | 2,389 | 110 | 2,199 | 13 | 1,23 | 0 | 123 | 110 | 246 | 3,358 | 24 | 3,166 | 0 | 3,190 | 6 | 1,095 | 0 |
| | Total | 2,720 | 90 | 2,557 | 57 | 1,23 | 0 | 123 | 110 | 290 | 3,864 | 264 | 3,407 | 0 | 3,671 | 174 | 1,095 | 0 |
| Santa Catalina | Urban | 248 | 33 | 233 | 13 | 233 | 0 | 12 | 25 | 363 | 172 | 173 | 0 | 345 | 139 | 0 | 139 | |
| | Rural | 2,129 | 100 | 2,000 | 0 | 1,777 | 0 | 0 | 93 | 93 | 3,233 | 124 | 2,947 | 0 | 3,071 | 0 | 1,170 | 0 |
| | Total | 2,377 | 133 | 2,233 | 13 | 1,954 | 0 | 105 | 118 | 3,596 | 296 | 3,120 | 0 | 3,416 | 139 | 1,170 | 0 | |
| Santa Cruz | Urban | 925 | 43 | 870 | 163 | 870 | 0 | 0 | 0 | 163 | 1,303 | 619 | 619 | 0 | 1,238 | 445 | 0 | 445 |
| | Rural | 5,425 | 43 | 5,100 | 0 | 4,802 | 0 | 382 | 0 | 382 | 8,091 | 43 | 7,643 | 0 | 7,686 | 0 | 2,841 | 0 |
| | Total | 6,350 | 217 | 5,970 | 163 | 5,455 | 0 | 382 | 0 | 545 | 9,394 | 662 | 8,262 | 0 | 8,924 | 445 | 2,841 | 0 |

Table 8.5.2 Additional Number of Households to be Served by Target Year (Household Toilets) (Cont'd.)

| Municipality | Area | Phase I (2000) | | | | | | | | | | | Phase II (2010) | | | | | | | | | | | | | |
|------------------|-------|------------------|------------|---------|-------|--------------------------|------------|---------|---------|---------------------------------------|------------|---------|------------------|------------|---------|-------|--------------------------|------------|---------|-------|---------------------------------------|------------|---------|---|---|---|
| | | Total Households | | | | No. of Served Households | | | | Add'l. No. of Households to be Served | | | Total Households | | | | No. of Served Households | | | | Add'l. No. of Households to be Served | | | | | |
| | | Flush | Pour Flush | Latrine | Total | Flush | Pour Flush | Latrine | Total | Flush | Pour Flush | Latrine | Flush | Pour Flush | Latrine | Total | Flush | Pour Flush | Latrine | Total | Flush | Pour Flush | Latrine | | | |
| Santa Lucia | Urban | 459 | 86 | 323 | 22 | 46 | 0 | 117 | 659 | 313 | 313 | 0 | 626 | 227 | 0 | 227 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Rural | 3,855 | 117 | 3,326 | 181 | 3,624 | 70 | 646 | 5,856 | 161 | 5,402 | 0 | 5,563 | 44 | 2,076 | 0 | 2,120 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Total | 4,314 | 203 | 3,649 | 203 | 4,055 | 116 | 781 | 6,515 | 474 | 5,715 | 0 | 6,189 | 271 | 2,076 | 0 | 2,347 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Total | 771 | 145 | 544 | 36 | 725 | 109 | 120 | 1,065 | 506 | 506 | 0 | 1,012 | 361 | 0 | 361 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Santa Maria | Urban | 4,382 | 48 | 3,865 | 206 | 4,119 | 16 | 83 | 6,293 | 63 | 5,915 | 0 | 5,978 | 15 | 2,050 | 0 | 2,065 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Rural | 5,153 | 193 | 4,409 | 342 | 4,844 | 125 | 83 | 7,358 | 569 | 6,421 | 0 | 6,990 | 376 | 2,050 | 0 | 2,266 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Total | 467 | 88 | 329 | 22 | 439 | 83 | 10 | 697 | 331 | 331 | 0 | 682 | 243 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Total | 2,605 | 593 | 1,322 | 227 | 2,142 | 0 | 0 | 3,956 | 593 | 3,165 | 0 | 3,758 | 0 | 1,843 | 0 | 1,843 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Santiago | Urban | 3,072 | 681 | 1,651 | 249 | 2,581 | 83 | 93 | 4,653 | 924 | 3,496 | 0 | 4,420 | 243 | 1,845 | 0 | 2,098 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Rural | 612 | 61 | 485 | 29 | 575 | 47 | 76 | 862 | 409 | 410 | 0 | 819 | 348 | 0 | 348 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Total | 3,882 | 58 | 3,409 | 182 | 3,649 | 0 | 118 | 5,682 | 58 | 5,340 | 0 | 5,398 | 0 | 1,931 | 0 | 1,931 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Total | 4,494 | 119 | 3,894 | 211 | 4,224 | 47 | 376 | 6,544 | 467 | 5,790 | 0 | 6,217 | 348 | 1,931 | 0 | 2,279 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sisay | Urban | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Rural | 381 | 0 | 340 | 18 | 358 | 0 | 73 | 610 | 0 | 580 | 0 | 580 | 0 | 240 | 0 | 240 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Total | 381 | 0 | 340 | 18 | 358 | 0 | 73 | 610 | 0 | 580 | 0 | 580 | 0 | 240 | 0 | 240 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 600 | 113 | 423 | 28 | 564 | 78 | 99 | 845 | 401 | 402 | 0 | 803 | 288 | 0 | 288 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sinaat | Urban | 4,496 | 3 | 4,012 | 211 | 4,226 | 0 | 746 | 5,960 | 3 | 5,659 | 0 | 5,662 | 0 | 1,647 | 0 | 1,647 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Rural | 5,046 | 116 | 4,435 | 239 | 4,799 | 78 | 845 | 6,805 | 404 | 6,061 | 0 | 6,465 | 288 | 1,647 | 0 | 1,931 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Total | 202 | 0 | 181 | 9 | 190 | 0 | 98 | 285 | 135 | 136 | 0 | 271 | 135 | 0 | 135 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Total | 342 | 0 | 305 | 16 | 321 | 0 | 187 | 529 | 0 | 503 | 0 | 503 | 0 | 198 | 0 | 198 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Sugpon | Urban | 541 | 0 | 486 | 25 | 511 | 0 | 285 | 814 | 135 | 639 | 0 | 774 | 135 | 198 | 0 | 198 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Rural | 327 | 58 | 234 | 15 | 307 | 53 | 36 | 523 | 348 | 249 | 0 | 497 | 190 | 15 | 0 | 205 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Total | 1,406 | 11 | 1,245 | 66 | 1,322 | 0 | 548 | 2,059 | 11 | 1,945 | 0 | 1,956 | 0 | 700 | 0 | 700 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Total | 1,733 | 69 | 1,479 | 81 | 1,629 | 53 | 594 | 2,582 | 259 | 2,194 | 0 | 2,453 | 190 | 715 | 0 | 905 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Tagudin | Urban | 913 | 175 | 658 | 44 | 877 | 29 | 75 | 1,418 | 674 | 673 | 0 | 1,347 | 499 | 15 | 0 | 514 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Rural | 5,280 | 456 | 4,259 | 248 | 4,963 | 261 | 445 | 8,165 | 630 | 7,118 | 0 | 7,757 | 183 | 2,859 | 0 | 3,042 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Total | 6,213 | 631 | 4,917 | 292 | 5,840 | 290 | 520 | 9,583 | 1,313 | 7,791 | 0 | 9,104 | 682 | 2,874 | 0 | 3,556 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Total | 8,263 | 1,553 | 5,826 | 388 | 7,767 | 548 | 208 | 12,095 | 5,745 | 5,745 | 0 | 11,490 | 4,192 | 0 | 4,192 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Vigan (Capital) | Urban | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Rural | 8,263 | 1,553 | 5,826 | 388 | 7,767 | 548 | 208 | 12,095 | 5,745 | 5,745 | 0 | 11,490 | 4,192 | 0 | 4,192 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Total | 8,263 | 1,553 | 5,826 | 388 | 7,767 | 548 | 208 | 12,095 | 5,745 | 5,745 | 0 | 11,490 | 4,192 | 0 | 4,192 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Total | 26,771 | 4,663 | 18,994 | 1,487 | 25,134 | 1,804 | 895 | 38,401 | 18,241 | 18,241 | 0 | 36,482 | 13,578 | 535 | 0 | 14,113 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Provincial Total | Urban | 86,534 | 3,757 | 73,109 | 4,171 | 81,037 | 974 | 9,180 | 156,225 | 5,084 | 114,851 | 0 | 119,915 | 1,407 | 41,742 | 0 | 43,049 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Rural | 113,305 | 8,420 | 92,093 | 5,658 | 106,171 | 2,778 | 10,075 | 164,626 | 23,305 | 133,092 | 0 | 156,397 | 14,885 | 42,272 | 0 | 57,162 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Total | 199,839 | 12,177 | 165,202 | 9,829 | 187,208 | 12,522 | 19,255 | 320,851 | 38,589 | 247,943 | 0 | 376,312 | 16,292 | 84,014 | 0 | 100,211 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 199,839 | 12,177 | 165,202 | 9,829 | 187,208 | 12,522 | 19,255 | 320,851 | 38,589 | 247,943 | 0 | 376,312 | 16,292 | 84,014 | 0 | 100,211 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |





**FIGURE 8.5.4
MAP SHOWING HOUSEHOLD
TOILETS SERVICE COVERAGE BY 2010**

(details are referred to Supporting Report). However, when the number of students to be served in target/s is less than or equal to the base year, no additional number of households to be served is considered.

The existing facilities are to be utilized during Phase I period, while the facilities in Phase I are to be utilized during Phase II period.

The projected number of served students at the end of Phase I period is 112,800. The additional students to be served totaled to 19,562. While at the end of Phase II period, the projected number of served students is 135,957. The additional students to be served are 23,157. Table 8.5.3 summarizes the number of public school students to be served by target year.

(3) Public toilets

The service coverage of public utilities with sanitary toilet facility is estimated by municipality for the years 2000 and 2010.

The future service coverage and additional coverage are estimated using the existing number of public utilities with sanitary toilets in the base year, the number of public utilities in target years, and provincial sector targets.

The additional number of public utilities with sanitary toilets needed by municipality is the shortfall of the number of public utilities in target year comparing with either the existing coverage or Phase I coverage (details are referred to Supporting Report).

The existing sanitary facilities are to be utilized during Phase I period. The facilities in Phase I are to be utilized during Phase II period.

The number of served public utilities at the end of Phase I period is 33. The additional public utilities to be served are 5. While at the end of Phase II period, the number of served public utilities is 62 with an additional public utilities to be served at 29. Table 8.5.4 summarizes additional number of public utilities to be served by municipality by target year.

8.5.3 Urban Sewerage

The service coverage in 2010 (Phase II) is estimated for the municipalities with population of more than 10,000 in urban area provided by Level III water supply. It is assumed that half of

Table 8.5.3 Additional Number of Public School Students to be Served by Target Year
(School Toilets)

| Municipality | Phase I (2000) | | | Phase I (2010) | | |
|-------------------------|-------------------------------------|---|--|-------------------------------------|---|--|
| | Total No. of Public School Students | Std. No. of Public School Students to be Served | Add'l No. of Public School Students to be Served | Total No. of Public School Students | Std. No. of Public School Students to be Served | Add'l No. of Public School Students to be Served |
| Alitem | 1,460 | 1,314 | 0 | 1,593 | 1,513 | 199 |
| Banayoyo | 1,525 | 1,373 | 33 | 1,721 | 1,635 | 262 |
| Bantay | 4,167 | 3,750 | 198 | 5,691 | 5,406 | 1,656 |
| Burgos | 2,192 | 1,973 | 31 | 2,500 | 2,375 | 402 |
| Cabugao | 5,228 | 4,705 | 255 | 6,134 | 5,827 | 1,122 |
| Candon | 10,620 | 9,558 | 4,258 | 12,482 | 11,858 | 2,300 |
| Caoayan | 2,640 | 2,376 | 0 | 2,925 | 2,779 | 403 |
| Cervantes | 3,019 | 2,717 | 1,117 | 3,422 | 3,251 | 534 |
| Galimuyod | 1,688 | 1,519 | 669 | 1,975 | 1,876 | 357 |
| G. del Pilar | 622 | 560 | 8 | 707 | 672 | 112 |
| Lidlidda | 797 | 717 | 23 | 910 | 865 | 148 |
| Magsingal | 4,761 | 4,285 | 835 | 5,611 | 5,330 | 1,045 |
| Nagbukel | 1,150 | 1,035 | 0 | 1,137 | 1,080 | 45 |
| Narvacan | 9,787 | 8,808 | 355 | 10,564 | 10,036 | 1,228 |
| Quirino | 1,550 | 1,395 | 295 | 1,997 | 1,897 | 502 |
| Salcedo | 2,604 | 2,344 | 294 | 2,783 | 2,644 | 309 |
| San Emilio | 1,375 | 1,238 | 838 | 1,616 | 1,535 | 297 |
| San Esteban | 1,435 | 1,292 | 13 | 1,667 | 1,584 | 292 |
| San Ildelfonso | 892 | 803 | 54 | 1,350 | 1,283 | 480 |
| San Juan | 5,797 | 5,217 | 131 | 6,257 | 5,944 | 727 |
| San Vicente | 1,640 | 1,476 | 576 | 2,830 | 2,689 | 1,213 |
| Santa | 2,608 | 2,347 | 8 | 2,938 | 2,791 | 444 |
| Santa Catalina | 2,368 | 2,131 | 681 | 2,738 | 2,601 | 470 |
| Santa Cruz | 6,488 | 5,839 | 2,189 | 8,102 | 7,697 | 1,858 |
| Santa Lucia | 5,177 | 4,659 | 3,059 | 6,314 | 5,998 | 1,339 |
| Santa Maria | 6,089 | 5,480 | 28 | 6,870 | 6,527 | 1,047 |
| Santiago | 3,479 | 3,131 | 1,281 | 4,324 | 4,108 | 977 |
| Santo Domingo | 4,698 | 4,228 | 131 | 5,410 | 5,140 | 912 |
| Sigay | 464 | 418 | 118 | 526 | 500 | 82 |
| Sinait | 6,217 | 5,595 | 75 | 6,576 | 6,247 | 652 |
| Sugpon | 675 | 608 | 8 | 747 | 710 | 102 |
| Suyo | 2,338 | 2,104 | 604 | 2,524 | 2,398 | 294 |
| Tagudin | 9,107 | 8,196 | 1,397 | 9,440 | 8,968 | 772 |
| Vigan (Capital) | 10,677 | 9,609 | 0 | 10,729 | 10,193 | 584 |
| Provincial Total | 125,334 | 112,800 | 19,562 | 143,110 | 135,957 | 23,157 |

Table 8.5.4 Additional Number of Public Utilities with Sanitary Toilets by Target Year

| Municipality | Type | Phase I Coverage (2000) | | Phase II Coverage (2010) | |
|--------------|-------------------|--|--|--|--|
| | | Additional No. of Public Utilities with Sanitary Toilets | Number of Public Utilities with Sanitary Toilets | Additional No. of Public Utilities with Sanitary Toilets | Number of Public Utilities with Sanitary Toilets |
| Alilem | Public Market | 0 | 0 | 1 | 1 |
| | Bus/Jeep Terminal | 0 | 0 | 1 | 1 |
| | Total | 0 | 0 | 2 | 2 |
| Banayoyo | Public Market | 0 | 0 | 0 | 0 |
| | Bus/Jeep Terminal | 0 | 0 | 1 | 1 |
| | Total | 0 | 0 | 1 | 1 |
| Bantay | Public Market | 0 | 0 | 0 | 0 |
| | Bus/Jeep Terminal | 0 | 3 | 0 | 3 |
| | Total | 0 | 3 | 0 | 3 |
| Burgos | Public Market | 0 | 0 | 0 | 0 |
| | Bus/Jeep Terminal | 0 | 0 | 0 | 0 |
| | Total | 0 | 0 | 0 | 0 |
| Cabugao | Public Market | 0 | 1 | 0 | 1 |
| | Bus/Jeep Terminal | 0 | 0 | 2 | 2 |
| | Total | 0 | 1 | 2 | 3 |
| Candon | Public Market | 0 | 1 | 0 | 1 |
| | Bus/Jeep Terminal | 0 | 1 | 2 | 3 |
| | Total | 0 | 2 | 2 | 4 |
| Caoayan | Public Market | 0 | 0 | 0 | 0 |
| | Bus/Jeep Terminal | 0 | 0 | 1 | 1 |
| | Total | 0 | 0 | 1 | 1 |
| Cervantes | Public Market | 1 | 1 | 0 | 1 |
| | Bus/Jeep Terminal | 1 | 1 | 0 | 1 |
| | Total | 2 | 2 | 0 | 2 |
| Galimuyod | Public Market | 0 | 0 | 0 | 0 |
| | Bus/Jeep Terminal | 0 | 0 | 0 | 0 |
| | Total | 0 | 0 | 0 | 0 |
| G. del Pilar | Public Market | 0 | 0 | 1 | 1 |
| | Bus/Jeep Terminal | 0 | 0 | 1 | 1 |
| | Total | 0 | 0 | 2 | 2 |
| Lididda | Public Market | 0 | 0 | 1 | 1 |
| | Bus/Jeep Terminal | 0 | 0 | 1 | 1 |
| | Total | 0 | 0 | 2 | 2 |
| Magsingal | Public Market | 0 | 1 | 0 | 1 |
| | Bus/Jeep Terminal | 0 | 0 | 0 | 0 |
| | Total | 0 | 1 | 0 | 1 |
| Nagbukel | Public Market | 0 | 0 | 0 | 0 |
| | Bus/Jeep Terminal | 0 | 0 | 1 | 1 |
| | Total | 0 | 0 | 1 | 1 |
| Narvacan | Public Market | 0 | 1 | 0 | 1 |
| | Bus/Jeep Terminal | 0 | 1 | 1 | 2 |
| | Total | 0 | 2 | 1 | 3 |
| Quirino | Public Market | 0 | 1 | 0 | 1 |
| | Bus/Jeep Terminal | 0 | 0 | 1 | 1 |
| | Total | 0 | 1 | 1 | 2 |
| Salcedo | Public Market | 0 | 1 | 0 | 1 |
| | Bus/Jeep Terminal | 0 | 0 | 1 | 1 |
| | Total | 0 | 1 | 1 | 2 |
| San Emilio | Public Market | 0 | 0 | 0 | 0 |
| | Bus/Jeep Terminal | 0 | 0 | 1 | 1 |
| | Total | 0 | 0 | 1 | 1 |

Table 8.5.4 Additional Number of Public Utilities with Sanitary Toilets by Target Year
(Cont'd.)

| Municipality | Type | Phase I Coverage (2000) | | Phase II Coverage (2010) | |
|------------------|-------------------|--|--|--|--|
| | | Additional No. of Public Utilities with Sanitary Toilets | Number of Public Utilities with Sanitary Toilets | Additional No. of Public Utilities with Sanitary Toilets | Number of Public Utilities with Sanitary Toilets |
| San Esteban | Public Market | 0 | 0 | 1 | 1 |
| | Bus/Jeep Terminal | 0 | 0 | 0 | 0 |
| | Total | 0 | 0 | 1 | 1 |
| San Ildelfonso | Public Market | 0 | 1 | 0 | 1 |
| | Bus/Jeep Terminal | 0 | 0 | 0 | 0 |
| | Total | 0 | 1 | 0 | 1 |
| San Juan | Public Market | 0 | 1 | 0 | 1 |
| | Bus/Jeep Terminal | 0 | 0 | 0 | 0 |
| | Total | 0 | 1 | 0 | 1 |
| San Vicente | Public Market | 0 | 1 | 0 | 1 |
| | Bus/Jeep Terminal | 0 | 0 | 0 | 0 |
| | Total | 0 | 1 | 0 | 1 |
| Santa | Public Market | 0 | 1 | 0 | 1 |
| | Bus/Jeep Terminal | 0 | 0 | 0 | 0 |
| | Total | 0 | 1 | 0 | 1 |
| Santa Catalina | Public Market | 0 | 0 | 0 | 0 |
| | Bus/Jeep Terminal | 0 | 0 | 0 | 0 |
| | Total | 0 | 0 | 0 | 0 |
| Santa Cruz | Public Market | 0 | 1 | 0 | 1 |
| | Bus/Jeep Terminal | 0 | 0 | 1 | 1 |
| | Total | 0 | 1 | 1 | 2 |
| Santa Lucia | Public Market | 0 | 1 | 0 | 1 |
| | Bus/Jeep Terminal | 0 | 0 | 0 | 0 |
| | Total | 0 | 1 | 0 | 1 |
| Santa Maria | Public Market | 0 | 1 | 0 | 1 |
| | Bus/Jeep Terminal | 0 | 0 | 1 | 1 |
| | Total | 0 | 1 | 1 | 2 |
| Santiago | Public Market | 1 | 1 | 0 | 1 |
| | Bus/Jeep Terminal | 0 | 0 | 0 | 0 |
| | Total | 1 | 1 | 0 | 1 |
| Santo Domingo | Public Market | 0 | 1 | 0 | 1 |
| | Bus/Jeep Terminal | 0 | 0 | 1 | 1 |
| | Total | 0 | 1 | 1 | 2 |
| Sigay | Public Market | 0 | 0 | 1 | 1 |
| | Bus/Jeep Terminal | 0 | 0 | 0 | 0 |
| | Total | 0 | 0 | 1 | 1 |
| Sinait | Public Market | 0 | 1 | 0 | 1 |
| | Bus/Jeep Terminal | 1 | 1 | 1 | 2 |
| | Total | 1 | 2 | 1 | 3 |
| Sugpon | Public Market | 0 | 0 | 1 | 1 |
| | Bus/Jeep Terminal | 0 | 0 | 1 | 1 |
| | Total | 0 | 0 | 2 | 2 |
| Suyo | Public Market | 0 | 0 | 1 | 1 |
| | Bus/Jeep Terminal | 0 | 0 | 1 | 1 |
| | Total | 0 | 0 | 2 | 2 |
| Tagudin | Public Market | 0 | 1 | 0 | 1 |
| | Bus/Jeep Terminal | 0 | 0 | 2 | 2 |
| | Total | 0 | 1 | 2 | 3 |
| Vigan (Capital) | Public Market | 1 | 2 | 0 | 2 |
| | Bus/Jeep Terminal | 0 | 6 | 0 | 6 |
| | Total | 1 | 8 | 0 | 8 |
| Provincial Total | Public Market | 3 | 20 | 7 | 27 |
| | Bus/Jeep Terminal | 2 | 13 | 22 | 35 |
| | Total | 5 | 33 | 29 | 62 |

the population in the area/s is to be served by the sewerage systems. Table 8.5.5 shows the population to be served in Phase II.

Table 8.5.5 Population to be Served by Urban Sewerage in Phase II

| Municipality | Urban Population in 2010 | Level III Water Supply Coverage | Population to be Served |
|-------------------------|--------------------------|---------------------------------|-------------------------|
| Bantay | 11,800 | 11,210 | 5,900 |
| Vigan (Capital) | 48,378 | 45,959 | 24,189 |
| Provincial Total | 153,582 | 145,902 | 76,799 |

8.5.4 Solid Waste

Future requirements in the sub-sector are studied giving priority to urban area for the Phase I. Staged improvement for the rural area shall be studied in the future.

Service coverage in Phase I is assumed to be 50% with reference to the current urban service coverage of 21%. Additional service coverage in Phase I is calculated as a shortfall of target coverage in Phase I comparing with existing service coverage. Table 8.5.6 presents additional service coverage for Phase I in the urban area.

8.6 Facilities, Equipment and Rehabilitation to Meet the Target Services

8.6.1 Water Supply

(1) Required facilities

Water supply facilities required by service level were estimated by urban and rural area by municipality based on the additional service coverage by target year and summarized in Table 8.6.1 (details are referred to Supporting Report).

Urban water supply:

Physical requirements of Level III systems are estimated as the number of required house connections. Mode of project indicates whether future urban water supply will be implemented as expansion of existing system or construction of a new system. Number of deep wells was also estimated based on the water source evaluation results in Chapter 7.

Table 8.5.6 Add'l No. of Urban Households to be Served by Municipal Solid Waste System in Phase I

| Municipality | No. of Urban Households Served in the Base Year | Phase I Coverage (2000) | | |
|-------------------------|---|-------------------------|--------------------------|---|
| | | No. of Urban Households | Urban Household Coverage | Add'l. No. of Urban Households to be Served |
| Alilem | 0 | 282 | 141 | 141 |
| Banayoyo | 0 | 173 | 87 | 87 |
| Bantay | 0 | 2,054 | 1,027 | 1,027 |
| Burgos | 0 | 310 | 155 | 155 |
| Cabugao | 0 | 1,672 | 836 | 836 |
| Candon | 0 | 1,471 | 736 | 736 |
| Caoayan | 0 | 1,436 | 718 | 718 |
| Cervantes | 0 | 484 | 242 | 242 |
| Galimuyod | 0 | 86 | 43 | 43 |
| G. del Pilar | 0 | 126 | 63 | 63 |
| Lidlidda | 0 | 259 | 130 | 130 |
| Magsingal | 0 | 1,139 | 570 | 570 |
| Nagbukel | 0 | 152 | 76 | 76 |
| Narvacan | 0 | 573 | 287 | 287 |
| Quirino | 0 | 286 | 143 | 143 |
| Salcedo | 0 | 290 | 145 | 145 |
| San Emilio | 0 | 443 | 222 | 222 |
| San Esteban | 0 | 156 | 78 | 78 |
| San Hdefonso | 0 | 208 | 104 | 104 |
| San Juan | 0 | 749 | 375 | 375 |
| San Vicente | 0 | 234 | 117 | 117 |
| Santa | 0 | 381 | 191 | 191 |
| Santa Catalina | 0 | 248 | 124 | 124 |
| Santa Cruz | 0 | 925 | 463 | 463 |
| Santa Lucia | 331 | 459 | 331 | 0 |
| Santa Maria | 696 | 771 | 696 | 0 |
| Santiago | 1,407 | 467 | *1,407 | 0 |
| Santo Domingo | 0 | 612 | 306 | 306 |
| Sigay | 0 | 0 | 0 | 0 |
| Sinait | 0 | 600 | 300 | 300 |
| Sugpon | 0 | 202 | 101 | 101 |
| Suyo | 0 | 327 | 164 | 164 |
| Tagudin | 0 | 933 | 467 | 467 |
| Vigan (Capital) | 2,859 | 8,263 | 4,132 | 1,273 |
| Provincial Total | 5,293 | 26,771 | 14,977 | 9,684 |

Note: * - Covers some rural barangays/households.

Table 8.6.1 Water Supply Facilities Required by Target Year

| Municipality | Phase I (2000) Requirements | | | | | | | | | | | Phase II (2010) Requirements | | | | | | | | | | |
|-------------------------|--------------------------------|------------------------------|-----------------------------|------------------|-------------------------|------------------------------|------------|----------|--------------------------------|------------------------------|-----------------------------|------------------------------|------------|-----------|--------------------|-------------------------|------------|----------|--------------|----------|--------------|--|
| | Urban Water Supply (Level III) | | | | | Rural Water Supply (Level I) | | | Urban Water Supply (Level III) | | | Rural Water Supply (Level I) | | | | | | | | | | |
| | Mode of Project | No. of Additional Deep Wells | Number of House Connections | Number of System | No. of Communal Faucets | Number of Deep Wells | | | Total No. of Wells | No. of Additional Deep Wells | Number of House Connections | Number of Deep Wells | | | Total No. of Wells | Number of Shallow Wells | | | | | | |
| | | | | | | 30 m | 50 m | 70 m | | | | 30 m | 50 m | 70 m | | | Sub-total | | | | | |
| Allern | New | 1 | 68 | 0 | 0 | 25 | 0 | 0 | 25 | 0 | 0 | 0 | 25 | 1 | 301 | 11 | 0 | 0 | 11 | 0 | 11 | |
| Bamayo | New | 1 | 10 | 0 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 4 | 1 | 214 | 14 | 0 | 0 | 14 | 0 | 14 | |
| Barrav | Expansion | 1 | 367 | 0 | 0 | 37 | 0 | 0 | 37 | 0 | 0 | 0 | 37 | 1 | 2,038 | 0 | 47 | 0 | 47 | 0 | 47 | |
| Bucos | New | 1 | 87 | 1 | 20 | 21 | 0 | 0 | 21 | 0 | 0 | 0 | 21 | 1 | 304 | 24 | 0 | 0 | 24 | 0 | 24 | |
| Cabazon | Expansion | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 9 | 1 | 1,981 | 0 | 59 | 0 | 59 | 0 | 59 | |
| Canden | New | 1 | 373 | 0 | 0 | 134 | 0 | 0 | 134 | 0 | 0 | 0 | 134 | 1 | 1,521 | 106 | 0 | 0 | 106 | 0 | 106 | |
| Caosayan | Expansion | 1 | 239 | 0 | 0 | 37 | 0 | 0 | 37 | 0 | 0 | 0 | 37 | 1 | 1,428 | 0 | 27 | 0 | 27 | 0 | 27 | |
| Cervantes | New | 1 | 85 | 0 | 0 | 17 | 0 | 0 | 17 | 0 | 0 | 0 | 17 | 1 | 604 | 30 | 0 | 0 | 30 | 0 | 30 | |
| Colimwood | New | 1 | 2 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 117 | 22 | 0 | 0 | 22 | 0 | 22 | |
| G. del Pilar | New | 0 | 0 | 1 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 19 | 7 | 0 | 0 | 7 | 0 | 7 | |
| Ludidda | New | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 346 | 7 | 0 | 0 | 7 | 0 | 7 | |
| Maganzal | New | 1 | 110 | 1 | 20 | 0 | 26 | 0 | 26 | 0 | 0 | 0 | 26 | 1 | 1,330 | 0 | 50 | 0 | 50 | 0 | 50 | |
| Magsukul | New | 1 | 37 | 1 | 20 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 4 | 1 | 156 | 9 | 0 | 0 | 9 | 0 | 9 | |
| Narvacan | Expansion | 1 | 119 | 0 | 0 | 164 | 0 | 0 | 164 | 0 | 0 | 0 | 164 | 1 | 409 | 96 | 0 | 0 | 96 | 0 | 96 | |
| Quimbo | New | 1 | 44 | 3 | 60 | 20 | 0 | 0 | 20 | 0 | 0 | 0 | 20 | 1 | 328 | 16 | 0 | 0 | 16 | 0 | 16 | |
| Salcedo | New | 1 | 35 | 0 | 0 | 15 | 0 | 0 | 15 | 0 | 0 | 0 | 15 | 1 | 330 | 24 | 0 | 0 | 24 | 0 | 24 | |
| San Emilio | New | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 1 | 639 | 11 | 0 | 0 | 11 | 0 | 11 | |
| San Esteban | New | 1 | 20 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 7 | 1 | 183 | 17 | 0 | 0 | 17 | 0 | 17 | |
| San Ildefonso | New | 1 | 23 | 0 | 0 | 25 | 0 | 0 | 25 | 0 | 0 | 0 | 25 | 1 | 254 | 0 | 11 | 0 | 11 | 0 | 11 | |
| San Juan | New | 1 | 68 | 0 | 0 | 28 | 0 | 0 | 28 | 0 | 0 | 0 | 28 | 1 | 862 | 0 | 51 | 0 | 51 | 0 | 51 | |
| San Vicente | New | 1 | 2 | 0 | 0 | 29 | 0 | 0 | 29 | 0 | 0 | 0 | 29 | 1 | 329 | 0 | 27 | 0 | 27 | 0 | 27 | |
| Santa | Expansion | 1 | 41 | 1 | 20 | 0 | 29 | 0 | 29 | 0 | 0 | 0 | 29 | 1 | 243 | 0 | 31 | 0 | 31 | 0 | 31 | |
| Santa Catalina | New | 1 | 33 | 0 | 0 | 19 | 0 | 0 | 19 | 0 | 0 | 0 | 19 | 1 | 301 | 0 | 28 | 0 | 28 | 0 | 28 | |
| Santa Cruz | New | 1 | 184 | 0 | 0 | 66 | 0 | 0 | 66 | 0 | 0 | 0 | 66 | 1 | 1,004 | 72 | 0 | 0 | 72 | 0 | 72 | |
| Santa Lucia | Expansion | 1 | 41 | 0 | 0 | 52 | 0 | 0 | 52 | 0 | 0 | 0 | 52 | 1 | 343 | 51 | 0 | 0 | 51 | 0 | 51 | |
| Santa Maria | New | 1 | 266 | 0 | 0 | 101 | 0 | 0 | 101 | 0 | 0 | 0 | 101 | 1 | 679 | 58 | 0 | 0 | 58 | 0 | 58 | |
| Santiago | Expansion | 1 | 69 | 0 | 0 | 29 | 0 | 0 | 29 | 0 | 0 | 0 | 29 | 1 | 485 | 35 | 0 | 0 | 35 | 0 | 35 | |
| Santo Domingo | Expansion | 1 | 56 | 0 | 0 | 15 | 0 | 0 | 15 | 0 | 0 | 0 | 15 | 1 | 742 | 0 | 52 | 0 | 52 | 0 | 52 | |
| Sigay | New | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 3 | |
| Sinait | Expansion | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 32 | 0 | 0 | 0 | 32 | 1 | 554 | 0 | 60 | 0 | 60 | 0 | 60 | |
| Sugpon | New | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 5 | 1 | 271 | 5 | 0 | 0 | 5 | 0 | 5 | |
| Suyo | New | 1 | 58 | 0 | 0 | 17 | 0 | 0 | 17 | 0 | 0 | 0 | 17 | 1 | 413 | 19 | 0 | 0 | 19 | 0 | 19 | |
| Togudin | Expansion | 1 | 5 | 0 | 0 | 38 | 0 | 0 | 38 | 0 | 0 | 0 | 38 | 1 | 675 | 70 | 0 | 0 | 70 | 0 | 70 | |
| Yuan (Capital) | Expansion | 1 | 1,227 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 8,286 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Provincial Total | Expansion-4 | 27 | 3,669 | 8 | 160 | 735 | 264 | 0 | 999 | 0 | 0 | 0 | 999 | 35 | 27,692 | 707 | 443 | 0 | 1,150 | 0 | 1,150 | |

Rural water supply:

Physical requirements of Level II systems are estimated as the number of systems and number of communal faucets, while that of Level I wells are estimated as the number of wells with classification of deep and shallow wells. Deep wells are further subdivided in terms of three different standard depths based on the water source evaluation results.

(2) Rehabilitation

Rehabilitation requirements are estimated as 10% of the total number of deep wells to be constructed under PW4SP. Rehabilitation work is mainly redevelopment of wells by means of air surging, while minor repair of concrete apron and handpump was considered to be undertaken by respective beneficiary organizations.

(3) Equipment

Logistic support:

For rural water supply development, 1 unit each or set of the following equipment was considered necessary for the provincial government to conduct various activities of PW4SP implementation;

Transportation- service vehicle.

Office equipment- computer with printer, typewriter, mimeo machine, scanning machine and copier.

Field equipment- water testing kit, sound system, tape recorder and tools for maintenance.

For urban water supply, no hardware was considered.

Well drilling and rehabilitation equipment:

As a reference information, necessary types and number of well drilling and rehabilitation equipment were studied considering the existing equipment of sector agencies in the province.

During the Phase I period, a total of 999 Level I deep wells shall be newly constructed and 10% of these deep wells shall be rehabilitated annually. Although there are huge requirements, only each 1 unit of truck-mounted and trailer-mounted percussion drilling rigs, each 1 unit of trailer-mounted and portable mechanized rotary drilling rigs and 1 unit of air compressor for well rehabilitation are available at DPWH-DEO in the province.

Therefore, a total of 17 sets of drilling rigs (7 sets of medium size rotary type and 10 sets of medium size percussion type) together with 2 sets of well rehabilitation equipment, 3 units of support vehicles for well rehabilitation and 17 units of service trucks for deep well construction shall be mobilized/procured either by private sector or LGUs (details are referred to Supporting Report).

8.6.2 Sanitation

This sub-section refers to physical requirements by target year covering household, school and public toilet facilities. Table 8.6.2 presents the required sanitation facilities by target year. Rehabilitation for the sanitation facilities is considered as part of recurrent cost.

(1) Household toilets

Future requirements in the number of household toilets by different type for urban and rural areas are estimated based on the additional households to be served by type of facility both for urban and rural areas by target year (details are referred to Supporting Report).

(2) School toilets

The future requirements in the number of toilet facilities are estimated based on the standard number of students to be served by a 5-unit standard facility and the additional students to be served by target year (details are referred to Supporting Report).

Total required facilities are further broken down into urban and rural areas by applying the percentage share of urban and rural population.

(3) Public toilets

Future requirements in the number of toilet facilities are estimated based on the additional number of toilets for public markets and bus/jeepney terminals located in urban areas (details are referred to Supporting Report).

8.6.3 Urban Sewerage and Solid Waste

Physical requirements for the sewerage facilities are not discussed in this sub-section. Further study shall be conducted in the future.

As reference information, the number of refuse collection trucks is estimated for the urban area in Phase I. Additional units of truck required is 30 to meet assumed service coverage as reflected in Table 8.6.3.

Table 8.6.3 Number of Refuse Collection Trucks Required in Phase I

| Municipality | Additional Urban Households to be Served | Estimated Daily Amount of Refuse to be Generated (Kg) | Number of Collection Trucks Required |
|-------------------------|--|---|--------------------------------------|
| Alilem | 141 | 59 | 1 |
| Banayoyo | 87 | 36 | 1 |
| Bantay | 1,027 | 429 | 1 |
| Burgos | 155 | 65 | 1 |
| Cabugao | 836 | 349 | 1 |
| Candon | 736 | 308 | 1 |
| Caoayan | 718 | 300 | 1 |
| Cervantes | 242 | 101 | 1 |
| Galimuyod | 43 | 18 | 1 |
| G. del Pilar | 63 | 26 | 1 |
| Lidlidda | 130 | 54 | 1 |
| Magsingal | 570 | 238 | 1 |
| Nagbukel | 76 | 32 | 1 |
| Narvacan | 287 | 120 | 1 |
| Quirino | 143 | 60 | 1 |
| Salcedo | 145 | 61 | 1 |
| San Emilio | 222 | 93 | 1 |
| San Esteban | 78 | 33 | 1 |
| San Ildelfonso | 104 | 43 | 1 |
| San Juan | 375 | 157 | 1 |
| San Vicente | 117 | 49 | 1 |
| Santa | 191 | 80 | 1 |
| Santa Catalina | 124 | 52 | 1 |
| Santa Cruz | 463 | 194 | 1 |
| Santa Lucia | 0 | 0 | 0 |
| Santa Maria | 0 | 0 | 0 |
| Santiago | 0 | 0 | 0 |
| Santo Domingo | 306 | 128 | 1 |
| Sigay | 0 | 0 | 0 |
| Sinait | 300 | 125 | 1 |
| Sugpon | 101 | 42 | 1 |
| Suyo | 164 | 69 | 1 |
| Tagudin | 467 | 195 | 1 |
| Vigan (Capital) | 1,273 | 532 | 1 |
| Provincial Total | 9,684 | 4,048 | 30 |

8.7 Identification of Priority Projects for Medium-Term Development Plan

In general, the present service coverage by municipality with reference to the target coverage indicates the direction of development effort for implementing PW4SP with municipal priorities.

Specific projects shall be selected subject to detailed studies and rather not discussed in provincial master plan. In addition, pertinent information to identify priority projects is not available both at provincial and municipal level during this PW4SP preparation, except some WDs for future expansion work.

The general criteria for identifying priority projects as guide for implementing the PW4SP are summarized below.

The first level of priority should be given to projects with positive feasibility studies and identified funding. Next level of priority would be given to projects with positive feasibility studies, although no funding source has been identified. The third level should be those for which feasibility study has been conducted. Within each level, if funds were insufficient, a ranking could be carried out in application of some factors such as willingness to pay, water-related diseases status and per capita cost. Under the above mentioned conditions, a list of projects shall be prepared by the implementors.

Due attention shall be paid on the importance of integrated development of relevant sub-sectors to maximize the effects and benefits through simultaneous implementation of water supply and sanitation projects. On a municipal level priority, synthetic evaluation of sector components for concerned municipalities (which is studied in the financial arrangements, Chapter 11) may be used for implementation arrangements.



Chapter 9

SECTOR MANAGEMENT PLAN



9. SECTOR MANAGEMENT PLAN

9.1 General

In order to effectively manage the water and sanitation sector, the provincial and municipal governments will have to make some adjustments in their current structures and policies. This Chapter proposes the mechanisms, processes and structures needed in the medium-term to achieve the coverage targets with sustainability. Not all recommendations can be laid out with the same level of detail at this time as some are dependent on further policy guidelines being formulated at the national level. These include, for example: the on-going study on access of LGUs to external financing assistance and the formulation of the Implementing Rules and Regulations to guide, among others, the sector devolution process.

9.2 Sector Management

(1) Development of the vision

One glaring institutional need at the local level is a common vision and mission statement for the sector. A critical mass of people and resources who share in the vision must be identified and harnessed for project implementation. Local planners need to focus on the long-term requirements i.e., beyond forming users' associations, drilling wells, distributing bowls, etc. Based on a realistic assessment of constraints, opportunities and demand, the province has set its vision and mission for the sector.

Initial vision statement: The province will adopt a two-phased plan which seeks to dramatically improve the provision of water supply and sanitation: In the medium-term (1996-2000) plan, the province seeks to increase to 85% the water supply coverage in both urban and rural areas. On the other hand, household toilets will be made available to 94% of the total population; 90% of students in public schools will have adequate sanitary toilet facilities; 100% of the public utilities will have sanitary toilets; and 50% of the total population will be covered by solid waste collection facilities. For its long-term (2001-2010) plan, the province will pursue a more vigorous program to increase water supply coverage in both urban and rural areas to 95%. For the sanitation sub-sector, individual household toilets will increase up to 95%; school toilets will rise up to 95%; public utilities will maintain a 100% sanitary toilet coverage; while sewerage will cover 50% of the urban population.

(2) Sector management

A Sector Management Model is presented in Figure 9.2.1 for sector management and project development. It is envisaged that this PW4SP will be used as a basis for the Annual Sector Plan and/or input into Loan or Grant Negotiations in the future. The Annual Sector Plan, together with the budgets will be reviewed by the Governor and passed upon by the legislation as part of the annual provincial budget approval process.

The Sector Level Implementation activities consist principally of three (3) broad areas: social marketing; technical assistance; and monitoring. Project selection follows on from a self-selection process. The identification of a responsible community-based association and technical studies, as needed, will be done. Only after the institutional, financial and technical studies have been done, construction or rehabilitation will take place. Operation and maintenance, including arrangements for finances of the system will be the responsibility of the community organization. The Monitoring Function, on the other hand, will be augmented with water quality surveillance by the Provincial Health Office (PHO) and operational audits done by the LGU.

(3) Service provision policies and objectives

The LGU seeks to provide an adequate level of water and sanitation facilities defined as follows:

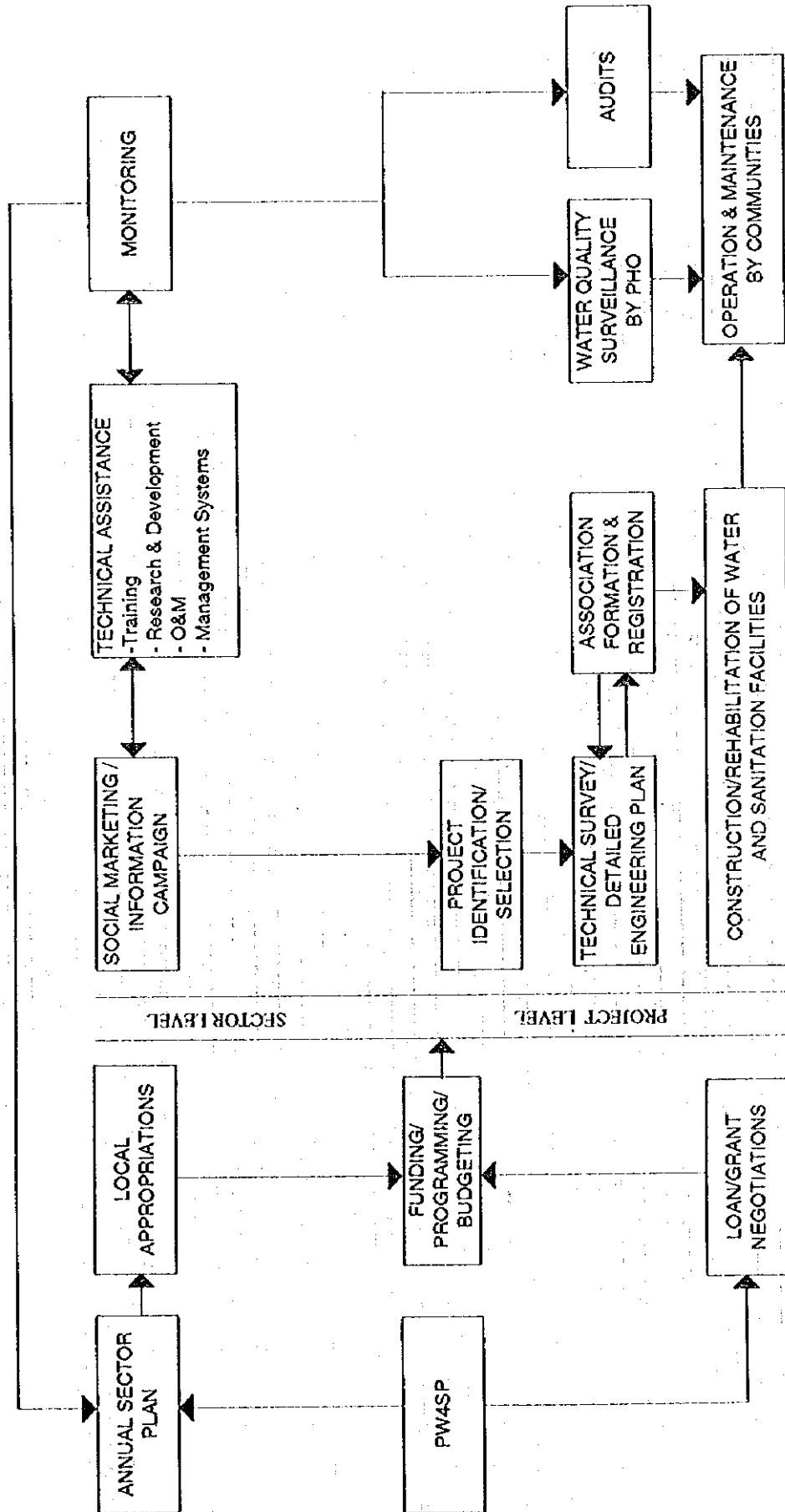
- 1) Level I facilities serve, at most, 15 (fifteen) households; Level II public taps serve 5 (five) households; and Level III provides individual household connections.
- 2) Water supply provision will be at least 20 lpcd for Level I; 60 lpcd for Level II; and 100 lpcd for Level III.
- 3) A critical mass of 70% of the individual households in every barangay has sanitary toilet facilities.
- 4) All schools shall have adequate water supply and at least one sanitary toilet facility for every 50 students.

(4) Operating policies

The following policy and strategy statements are adopted by the Provincial Government. These may be reviewed and revised from time to time by the Provincial Government. The key policy statements include the following:

- 1) Sustainability shall be promoted through increased community responsibility for management of facilities. Unless potential users demonstrate initiative and commitment (beyond making the request for assistance) to maintain the systems, no

Figure 9.2.1 Sector Management Model



support shall be provided by the LGUs. To the extent possible, the LGUs should utilize existing local resources (self reliance).

- 2) Selection and prioritization of projects shall be based on demonstrated commitment of the beneficiaries to participate in the project and their willingness to pay; the current water, sanitation and overall health conditions; potentials for growth; and cost implications.
- 3) Technology to be used for the projects shall be appropriate to the local conditions and resources. However, construction of economical facilities shall be pursued not necessarily insisting on low-cost. Phased upward integration and future upgrading of systems and facilities shall also be promoted utilizing to the extent possible previously constructed facilities. In urban centers, a range of technologies may be adopted for wastewater collection and treatment, as well as for drainage.
- 4) An integrated approach to the provision of potable water supply, sanitation and hygiene education shall be promoted. All projects to be developed by the LGU must involve these three elements.
- 5) The LGU shall seek to provide water and sanitation in an equitable manner between rural and urban areas; between wealthy and depressed areas.
- 6) Cost Recovery and Cost Sharing (Subsidy Policies): The LGU shall enforce a rational and consistent policy on the application of subsidies and loans for water supply and sanitation. The current national policy is that 100% of the capital costs for Level I systems are provided as grant; communities, however, have to establish an O&M reserve fund and are responsible for all maintenance and operating costs. Water source development is provided as grants for Level II systems; full cost recovery is required for all other capital costs. Full capital and O&M cost recovery is required for Level III systems.
- 7) Private Sector Participation: The government shall give the private sector a substantial and preferential role in the attainment of the PW4SP objectives. In harnessing their participation, less government intervention shall be exercised in areas where the private sector is or can be a key player. An environment designed to empower them to absorb new social responsibilities and proactively convey to the government their aspirations and interests shall be established. The formation of private sector groups, NGOs, community organizations, cooperatives and people's organizations shall be encouraged. The implementation of programs to develop their capabilities in the sector development programs shall be promoted.
- 8) The province's fiscal management, in terms of capital funds generation capability, budget and disbursement, shall be improved. The assistance of legislative branch in

- 8) The province's fiscal management, in terms of capital funds generation capability, budget and disbursement, shall be improved. The assistance of legislative branch in the enactment of the proposed revenue-generating measures shall be sought. Financing through the private sector will also be encouraged.
- 9) Sector development shall be consistent with broader concerns for the environmental protection and management. Pollution control, conservation and proper utilization of water and land resources are critical issues. An environmentally-responsive management approach to resource use shall be pursued.
- 10) Disaster Response and Emergency Coordination: The LGU shall formulate, as part of its contingency plans, a program to address emergency conditions. The program shall include maintenance of stocks of chlorine, organization and training of local communities on restoration of water supplies and provision of emergency sanitary facilities. The LGU should coordinate closely and regularly with the local officials of the Regional Disaster Coordinating Council (RDCC).

(5) Regulatory policies

In coordination with appropriate national and local agencies, the LGU shall endeavor to set up an effective regulatory framework considering the following:

- 1) Water allocation and water rights policies (conflict resolution) which are within the mandate of the National Water Resources Board. Studies are underway to strengthen the linkages between the Board and other agencies, including LGUs, particularly in the enforcement of NWRB policies.
- 2) Water Rate Review: While the rate setting and approval functions remain largely as a concern of the associations or the water districts (and LWUA), a vehicle for resolving grievances against unrealistic tariffs (or other practices) can be instituted by the LGUs. The court system, of course, remains as the final arbiter in conflicts.
- 3) Association Registration: The LGUs shall likewise adopt a registration and franchising system for associations responsible for water supply facilities outside the WD franchise areas. Annual reporting requirements will have to be established for monitoring and possibly, auditing purposes.
- 4) Water Quality: The National Drinking Water Standards have been established. The LGUs will have to establish a viable mechanism, including water testing and standards enforcement, to ensure that water delivered meet the potability standards. The DOH currently has the responsibility and the regulatory power to stop the operations of water systems not delivering potable water.

(6) Financing system

Current policy shifts present an opportunity for the LGU to establish the conduit for future local and foreign-assisted projects. Presently, funds are brought to the field level through government allotment and sub-allotment systems of central government agencies.

Apart from being cumbersome and subject to delays, the more critical idiosyncrasy of this system is that the actual project implementation "power" still lies in the hands of national agencies.

Overall, it is the LGU responsibility to raise funds to support capital development sector projects and to ensure that adequate O&M reserves are raised by the beneficiary communities.

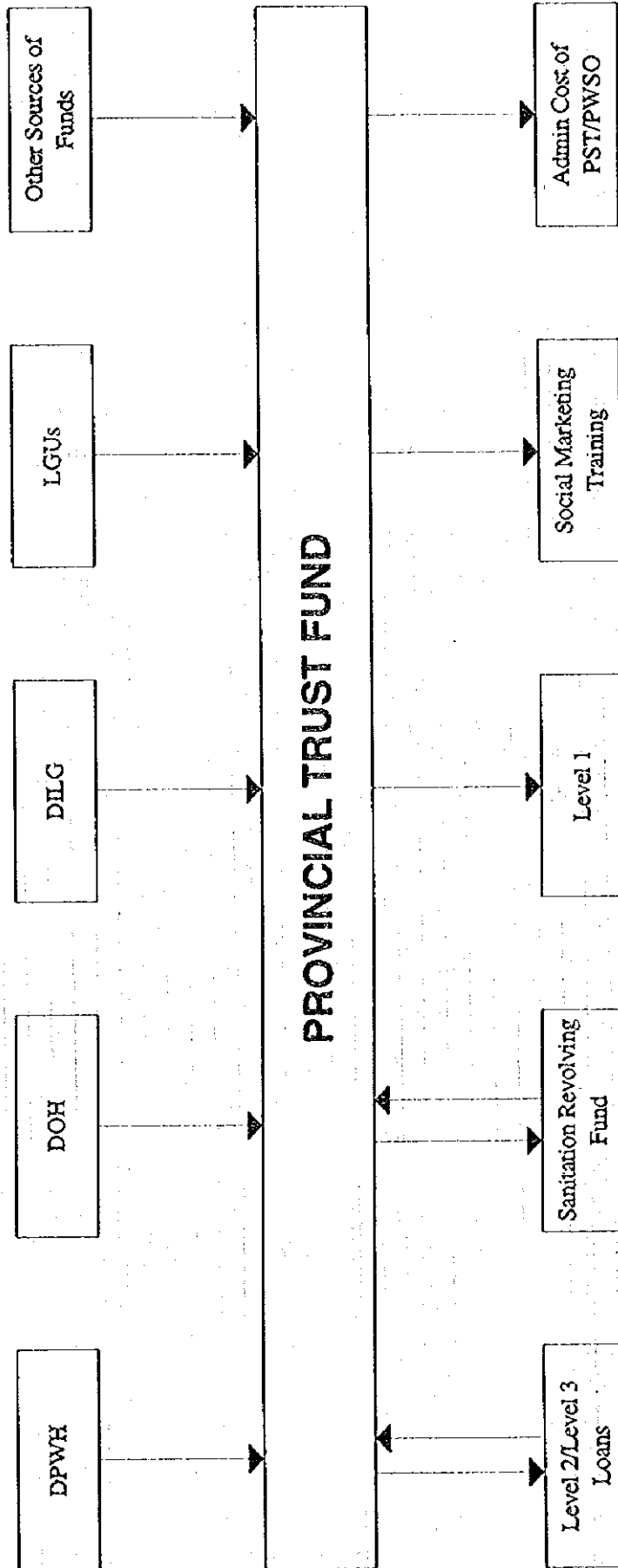
In the medium-term, the primary source of funds are envisaged to be provincial & local taxes & allocation from the IRA 20% Development Fund. Also, in the medium-term, it is envisaged that national & external funds will, although diminishing, continue to be channeled through local offices of central agencies.

Studies are underway to look into the feasibility of direct access of LGUs to external funds. The LGU will continue to monitor the developments and policy decision to be established as these will invariably affect local financing mechanisms.

In the long-term, the Provincial Sector Trust Fund approach (Fig. 9.2.2) may be an additional mechanism for financing project-related activities. This Trust Fund can be the transition arrangement as the line departments gradually reduce their direct control over sector funds. The Trust Fund could also raise the LGUs responsibility for effective and efficient utilization of these funds. The Trust Fund may be regularly replenished by the line departments upon liquidation. The controlling device at the national level will be in the replenishment of the trust fund. If the results are not satisfactory, national government should be able to institute changes as conditions to fund replenishment. Reviews can be done regularly. This arrangement is subject to agreement with respective line departments.

To support sanitation activities, housing improvement loans for installing in-house sanitary facilities should be studied and instituted by the LGU. Such a mechanism can be organized with the rural banks or the existing credit cooperatives. Seed funding for this revolving fund also needs to be raised.

Figure 9.2.2 Flow of Funds



Upon agreement by the parties, the enabling local legislation establishing the Trust Fund and the sanitation revolving fund will have to be enacted.

9.3 Institutional Arrangements

In the medium-term, a full-time Provincial Sector Team (PST) for coordination and institution-building shall be set up. The LGU should ensure that adequate logistics and incentives are provided. This Team may be supplemented by staff detailed full-time from national and local agencies, as needed. In the long term, the core group from the Team will form a new Provincial Water Supply and Sanitation Office (PWSO). The PWSO will continue to promote, assist and monitor all water supply and sanitation services in cooperation with the municipalities. The DILG-PMO shall continue to provide technical and managerial assistance in the formative years of the PST/PWSO.

With the on-going discussions, it is not entirely clear at this time, how the water supply development capacity at the DPWH-DEO may be harnessed. One scenario is for the DEO to provide technical services at cost and in competition with other private contractors. Another scenario might call for the actual transfer of resources (equipment and staff) to the LGU. Policy decision and guidelines will be taken shortly at the national level.

The initial professional-level staffing of the PST/PWSO are estimated as follows:

| | |
|--|---|
| Provincial Water Supply & Sanitation Coordinator | 1 |
| Assistant Provincial Water Supply & Sanitation Coordinator | 1 |
| Community Development & Training Specialist | 2 |
| Water Supply & Sanitation Engineer | 2 |
| Monitoring Specialist | 1 |
| Total Personnel Required | 7 |

The Governor will make the appointment based on the short list. DILG will assist in preparing the shortlist of candidates for PST/PWSO Coordinator. The draft Terms of Reference for the various posts is proposed as follows:

(1) The Provincial Water Supply & Sanitation Coordinator (PWSC) will lead an interdisciplinary Provincial Sector Team. The PWSC will ensure timely preparation, implementation and reporting of sector and project progress based on the annual sector plan. For day to day operations, the PWSC will report to the Governor. The PWSC will

also liaise with all project implementors at the municipal level. The PWSC shall be the key contact person of the DILG PMO. Specific duties include:

- 1) Prepare guidelines, work plans and schedules for project implementation work at the municipal level; coordinate the work of consultants and NGOs in their various tasks.
- 2) Prepare a detailed work plan and program of activities for project implementation at the provincial level (including technical, financial and organizational aspects) and ensure regular reports on the progress of activities.
- 3) Guide the conduct of sector and project management and the supervision, and coordination of the PST/PWSO; ensure the quality and timeliness of the outputs of the other agencies and consultants.
- 4) Assess all future inputs required for project planning, design, supervision of construction and monitoring in subsequent phases of project implementation.
- 5) Take steps to ensure that adequate financing is available to support the sector capital development requirements.
- 6) Assist in the negotiations for external grants and loans.
- 7) Recommend policy and policy revisions to govern sector and project management activities.

(2) An Assistant Provincial Water Supply and Sanitation Coordinator will likewise be appointed to assist the PWSC in discharge of his/her duties and responsibilities of the PWSO.

(3) The Community Development and Training Specialist (CDTS) will be particularly responsible for implementing the community development and involvement aspects of the project. His/her task will include frequent contact with the municipal liaison staff and barangays to ensure that all project activities are demand-driven and sustainable. The CDTS will report to the PWSC. Specific duties include:

- 1) Identify initial areas and develop implementation arrangements for launching the project in the various municipalities.
- 2) Conduct regular dialogue and disseminate information among local leaders on water, sanitation and health issues.
- 3) Assist municipalities in overseeing the organization (or accreditation) of associations which will be responsible for water supply and sanitation facilities.
- 4) Coordinate the health and hygiene education program province-wide.
- 5) Review past training programs for water supply and sanitation, hygiene and sanitation education, and community organization and development, including any manuals or other training materials used.

- 6) Guide municipal liaison staff in developing/adapting a community training strategy and methodologies based on the principles of participation, adult education, experiential learning and task specific activities, including the review and development of training materials.
 - 7) Prepare the overall provincial training plan enhancing management skills, institutional strengthening, improving technical skills, and community promotion, awareness and development. This should include: training methodologies; types and numbers of training events for staff and communities; training of trainers; training packages, manuals and audio visuals; management aspects of training program; and staff requirements and cost estimates for all categories of training including equipment and materials.
 - 8) Assist municipal staff in identifying and selecting target communities and sites based on agreed upon criteria; develop methodologies and coordinate preliminary village surveys and gender analysis.
 - 9) Assist in coordinating activities of the municipal liaison.
- (4) The Water Supply and Sanitation Engineer (WSSE) will be responsible for all the technical aspects of the project including feasibility studies, design, construction, operation and maintenance. The WSSE will report to the PWSC. Specific duties include:
- 1) Review the existing technical and environmental situation relating to water supply and sanitation facilities and assess the needs for new facilities and rehabilitation.
 - 2) Prepare and update criteria and process for the selection of water supply and sanitation facilities appropriate to the conditions prevailing in the project areas focusing on systems that can be operated and maintained by the community.
 - 3) Review design standards for water supply and for on-site sanitation (human excreta disposal) facilities for individual households, communal and school latrines.
 - 4) Establish appropriate design standards and technical specifications for water and sanitation materials and equipment applicable to systems proposed in the project. Establish quality control mechanisms for the procurement of materials and equipment as appropriate.
 - 5) Prepare standard contract documents, specifications and cost estimates for civil works and procurement.
 - 6) Ensure proper construction supervision and monitoring in coordination with the municipal liaison. Ensure timely transport of LGU-provided materials to project sites.
 - 7) Provide for adequate maintenance of LGUs equipment and tools for water and sanitation facilities, including drilling rigs and vehicles.

- 8) Supervise major repair or rehabilitation work beyond the capacity of communities to undertake.
 - 9) Implement, in coordination with the PHO, the water quality surveillance system. Assist the PHO in enforcing sanctions or remedial measures in controlling drinking water quality.
- (5) The Monitoring Specialist (MS) will be responsible for ensuring that the status of sector projects and outputs are properly reported and fed back to management. His/her task will include frequent contact with the municipalities to ensure that all project activities are demand-driven and sustainable. The MS will report to the PWSC and liaise closely with the PPDO who has the responsibility for monitoring all development activities and needs in the province. Specific duties include:
- 1) Draft all project reports and documents including the quarterly and annual Sector Report.
 - 2) Maintain the Registry of associations responsible for water and sanitation in their respective communities.
 - 3) Coordinate and develop indicators for monitoring and evaluating the achievement of project objectives.
 - 4) Monitor actual costs for typical water supply and sanitation systems.
- (6) At the municipal level, a Municipal Sector Liaison (MSL) will be appointed by the respective mayors. Staff appointed may be the municipal development coordinator, the municipal engineer, the municipal health officer or any other qualified staff selected by the mayor. The role of the MSL will be very critical at all stages of sector and project management. The MSL should ensure that the activities guided by PST/PWSO are implemented at the barangay level, particularly information dissemination about funding opportunities. The MSL receives all requests for water and sanitation facilities including the commitment of the barangays to provide counterpart funds or labor for the projects. The MSL also programs the municipal funds (from municipal IRA allocation or other sources) to provide counterpart support or to fully finance the projects.

Supported by the PST/PWSO, the MSL ensures that a viable organization is set up or appointed to handle the operation, maintenance and fee collection for the water system. The MSL also reviews the detailed project plan and design. During implementation, the MSL monitors the construction and drilling activities. The activities of the MSL will be closely coordinated and reported to the PST/PWSO. If warranted, the mayor should

establish a municipal water and sanitation office in the long-term future to handle all the above functions when the level of activities shall have become substantial.

- (7) At the barangay level, the Barangay Council (BC), through its Committee on Health, and the Rural Health Unit (RHU) plays a major role in concretizing the community aspiration for improved water and sanitation services.

The BC is the entry point for all development activities in the community. Particularly, it will play an important role in preparatory stage before setting up the association (or appointment of the responsible group). The BC prepares the request for assistance and assembles available local resources (funds, manpower, materials) to serve as initial community counterpart to demonstrate barangay commitment.

The RHUs and their network of barangay health workers (volunteers), on the other hand, have established an effective primary health care delivery system in the province. The system will continue to provide, among others, health and hygiene education services focusing on the interdependence of safe water supplies and sanitary toilet facilities to achieve overall health and environmental benefits. The RHUs will be the principal data collectors to monitor the conditions in access and coverage of water supply and sanitation services.

- (8) At the national level, DPWH, DOH and DILG will continue to provide technical assistance to LGUs per NEDA Resolution No. 4, either directly or through their local field offices and staff. In addition, mandated government agencies, such as LWUA, will continue to provide technical and managerial services and loans to duly-organized water districts and RWSAs. Through the DOF and DBM, the IRA allocations will continue to be provided from which a portion can be allocated for sector projects. Since this IRA allocation for water and sanitation projects will likely be very limited, the LGU will have to coordinate with appropriate national agencies to gain access to external funds. Regulations, promulgated and enforced by national regulatory bodies, like the NWRB, will have to be complied with by the LGU. Further national policy guidelines will be issued by NEDA and the Office of the President.

9.4 Project Management Arrangements

(1) Level I

- 1) Project Selection: Self-selection and local initiative should be the basis. All barangays should be well-informed about sector opportunities and policies. The barangays

should take the first step by assessing their needs, deciding that they want to improve their water and sanitation above all other needs and expressing their aspiration. The initial tasks of LGUs will be social marketing and information dissemination. The barangay should also decide desired service level/s, with a full understanding of the cost recovery aspects and other responsibilities.

- 2) **Organization of associations:** More flexibility is needed in order to tap local community resources. The issue of the necessity of forming BWSAs has been raised on several occasions. The proliferation of single-purpose associations for every government-sponsored project tends to divide barangay resources and complicate barangay structures. Many socio-civic groups have in fact "adopted" facilities and are looking after their maintenance voluntarily. Actual success rate seems to be higher in areas where water supply is extremely difficult regardless of whether there is monitoring or not.

The basic principle is that the community agrees that a particular group at the local level will be responsible. Existing local groups with other socio-civic objectives, an active track record and which are ready, willing and able to take on the BWSA functions may be tasked with the responsibility for the facilities. LGUs will assess the situation and, if justified, approve alternative non-BWSA arrangements. BWSA formation, of course, remains an option. An "institutional accreditation" system can be organized. If the association fails to live up to its responsibilities, it can lose its accreditation to another group.

The association can decide how to organize itself internally in coordination with the municipal sector liaison. The important condition is that all functions have to be attended to. Thus, an association may subdivide itself by "puroks" or it may choose to operate as one institution.

- 3) **Technology and Technical Design Standards:** The former Rural Waterworks Development Corporation (whose functions were absorbed by LWUA) and the DPWH have developed a simplified procedure for conducting the initial data gathering. The formats, which are appended (Table 9.4.1 Supporting Report), may be adopted and used by the LGUs. If necessary, these forms can be revised to suit the specific needs of the barangay or municipality.
- 4) **Bidding of works and procurement of services and materials** should follow provision of PD 1594 and other appropriate government policies and practices. Where possible, major capital procurement shall be sourced within the province.

- 5) **Construction and Drilling:** Drillers and civil work contractors will be needed for any major rural water supply and sanitation undertaking. Construction inspection shall be done with the municipal sector liaison.
- 6) **Right of Way Acquisition:** Deed of Donation (or written permits to grant use of land) for proposed facility sites should be executed in favor of the municipal government/barangay prior to project approval.
- 7) **Major rehabilitation work, beyond the capacity of the associations, shall be referred to the municipality for action.** Clear definition of "major rehabilitation work" is needed. All costs incident to the rehabilitation shall be to the account of the association O&M reserve fund. The municipality supported by PST/PWSO will assist, if needed, the association in securing soft loans, if the reserve funds are inadequate.
- 8) **Operation & Maintenance will generally be the responsibility of the association.** To support the caretakers, a franchising system for major O&M activities may be instituted by the municipality (through a private firm, a major water district in the area or any other competent group). Mechanics and plumbers can organize well-equipped "mobile service centers" which visits all the facilities monthly to check-up facilities and provide technical advice on behalf of the LGUs.

With standardization, local hardware stores will find it more profitable to stock up on needed spare parts. The LGUs should not maintain spare parts, although it is expected to maintain a ready stock of fast-moving spares.

- 9) **Water Rate Setting:** Fees and rates shall be established and approved by the community prior to construction. The fees shall be sufficient to cover all monthly operation, maintenance and administration costs, as well as to establish a reserve fund.
- 10) **Fees Collection and Funds Management:** The association shall collect monthly fees. All funds of the association shall be deposited in a bank to be selected by the association.

(2) **Level II**

- 1) **Project Selection:** Guidelines similar to that of Level I project selection shall be followed, i.e., self-selection and local initiative. Two or more barangays (or puroks) may agree to have a joint water and sanitation project.

- 2) **Organization:** The RWSA model may be followed by the participating communities. Again, flexibility will be followed and alternative models for managing the system may be considered.
- 3) **Technology and Technical Design Standards:** Technical standards have been in use by LWUA for RWSAs and by DPWH for Level II systems. (See Table 9.4.2 with annexes, Supporting Report). As these are considered as national standards, they will be adopted by the LGUs.
- 4) **Bidding of works and procurement of services and materials** should follow provision of PD 1594 and all other applicable national and local legislation on bidding and award of contracts using public funds. LWUA uses standard formats and procedures for this process, which may be adopted by the LGUs.
- 5) **Construction** would usually be done by a contractor. Inspection would be undertaken by the RWSA; by the cooperative or the private developer; or by the LGUs depending on the institutional arrangement adopted.
- 6) **Right of Way Acquisition.** The association shall negotiate for the purchase of land on which facilities will be constructed. Should negotiations fail, the government may exercise the power of eminent domain to secure needed land.
- 7) **Operation & maintenance and rehabilitation** will be the responsibility of the association. It shall ensure that adequate tools and spare parts are available. It shall employ needed staff and caretakers.
- 8) **Water Rate Setting:** All fees shall be subject to public hearing and approval by the appropriate regulatory authority.
- 9) **Fees Collection and Funds Management:** Same policies for Level I shall apply. However, fee computation shall include provision for debt service and possibly a higher reserve requirement.

(3) Level III

- 1) **Project Selection:** Most Level III systems are to be initiated by the municipal governments. In principle, all communities, including rural areas, may request Level III services, provided that they are willing and able to take on the financial and managerial obligations for higher service levels. The point is that service level selection are community decisions.
- 2) **Organization:** There are several viable Level III models which may be adopted: the Water District Concept; an LGUs-managed system; a cooperative-run system; or a privately-owned and managed system. The LWUA-water district concept was briefly described in the preceding chapters. For detailed information, the LGUs should

contact and coordinate with LWUA. The second option for the LGUs is to maintain operational control over the utility. Current experiences, however, revealed many difficulties because of numerous government controls and restrictions. The private sector may be a viable option using the BOT mechanism or even as a longer term investment for private entrepreneurs for larger systems.

- 3) **Technology and Technical Design Specifications:** Regardless of the institutional model adopted, the technical design standards to be enforced should be uniform. Technical standards used by the water districts and LWUA will be adopted and enforced by the LGUs.
- 4) **Bidding of works and procurement of services and materials** shall follow the provision of PD 1594 and all other applicable national and local legislation on bidding and award of contracts using public funds. LWUA uses standard formats and procedures for this process, which may be adopted by the LGUs.
- 5) **Construction** would usually be done by a contractor. Inspection would be undertaken by the water district; by the cooperative or the private developer; or by the LGUs depending on the institutional arrangement adopted.
- 6) **Right of Way Acquisition:** The waterworks will have to negotiate for the purchase of land on which facilities will be constructed. Should negotiations fail, the government may exercise the power of eminent domain to secure needed lands.
- 7) **Operation & maintenance and rehabilitation** will be the responsibility of the waterworks. It shall ensure that adequate tools and spare parts are available. It shall employ needed staff and caretakers
- 8) **Water Rate Setting:** All rates are subject to public hearings and approval by the appropriate regulatory authority.
- 9) The waterworks shall establish a formal billing and collection system. In addition, business practice systems shall be adopted. The LWUA has established a comprehensive commercial practice system, which may be adopted by the organization.

9.5 Community Development Models

Policy: The LGU views community development and involvement principally as regular multisectoral activities, not project-related activities. This implies the need for the LGU to establish an institutional mechanism at the provincial and municipal levels to enhance trust and confidence of communities to the LGU and its ability and motivation for provision of vital services. Community management of the systems is a vital element for sustainability of the facilities. Communities are viewed not merely as beneficiaries but as decision makers for

critical aspects of local projects. Communities will be encouraged to collectively take stock of their resources and constraints and agree on a development program.

The LGU will review the roles and responsibilities of central and local governments, NGOs, the private sector and communities themselves. It shall assess community participation activities and related institutional arrangements of past community projects and constantly look into creative ways to promote and enable local participation.

The LGU shall promote the participation of NGOs to catalyze the involvement of women, youth, people's voluntary organizations (PVOs) and other segments of the community in project decision-making and management. It will focus on the role of women in the context of the design of institutional arrangements at all service levels. The review shall include: brief overview of women's socio-economic situation and their role in water and sanitation services; analysis of relevant NGOs, women's groups and private agencies that support community; and assessment of support action for women's participation essential for project sustainability.

For specific sector projects, the LGU will adopt a three-phase community involvement model. The model will outline the decision and action points, for which community inputs will be sought. These inputs are categorized according to the Pre-Construction Phase, the Construction Phase and the Post-Construction Phase.

Responsibilities: At the municipal level, the Municipal Sector Liaison will play a leading role in ensuring involvement of the beneficiaries at all phases of the project. The Community Development and Training Specialist of the municipality trained by PST/PWSO will provide technical assistance and advice.

One of the key activities in the PW4SP preparation is the formulation of viable models to promote community development in the projects. Each one model for Level I, II and III service was formulated based on socio-economic profiles, service needs and experience in selected communities. It is important to have a clear sequence (a strategy) to enable the communities to participate in the project through all the process.

Three sites were selected based on a set criteria which includes: needs, health situation, source availability, accessibility, potentials for replication, etc. The sites selected for the province are outlined in the table below; full write-up of the case is included in 9.5 Supporting Report.

Table 9.5.1 Summary of Community Development Study Sites

| Model Study Site | Proposed Service Level | Urban or Rural | Potential Service Area | | Potential Water Source | Sanitation Issues |
|--|------------------------|----------------|------------------------|------------|------------------------|-------------------|
| | | | Population | Households | | |
| Sitio Nagtupacan, Pudoc, San Vicente | I | R | 631 | 130 | Deep Well | Yes |
| Bgy. Manueva, Santa | II | R | 800 | 161 | Spring | No |
| Municipality of Magsingal (Poblacion Area) | III | U | 1,215 | 200 | Spring &/or Deep Well | No |

(1) For Level I facilities, community involvement and participation shall be promoted in the following manner.

1) Pre-Construction Phase

- (a) Dissemination of information
- (b) Establishment (or selection) of barangay or purok association and of the working relationships with other agencies
- (c) Election of officials
- (d) Assistance for the selection of potential water sources
- (e) Agreement on O&M arrangements
- (f) Computation and approval of water charges
- (g) Preparation of work/plan
- (h) Agreement to proceed the project
- (i) Assistance for the selection of contractor/s
- (j) Securing right-of-way (deed of donation or permit to use) for facility sites

2) Construction Phase

- (a) Provision of labor counterpart
- (b) Provision of materials
- (c) Dissemination of information
- (d) Inspection and feedback of the project activities
- (e) Provision of access to the contractor/s

3) Post-Construction Phase

- (a) Payment/collection of fees; fund-raising activities
- (b) Getting water samples regularly for quality testing
- (c) Preventive maintenance
- (d) Minor repair and parts replacement
- (e) Dissemination of health and hygiene information
- (f) Auditing of finances

- (g) Attendance in community meetings
- (h) Provision of adequate source protection, including maintenance of drainage to protect well site from contamination
- (i) Formulation of future improvement plans
- (j) Approval of major capital or rehabilitation budgets
- (k) Collection and provision of information as requested by the RHU or MSL
- (l) Preparation/maintenance of the barangay or site maps

(2) For Level II facilities

1) Pre-Construction Phase

- (a) Establishment of barangay or purok arrangements and working relationships with other agencies
- (b) Identification and selection of potential water sources
- (c) Identification of the location of communal faucets
- (d) Agreement to proceed the project
- (e) Dissemination of information
- (f) Election of officials
- (g) Agreement on O&M arrangements
- (h) Computation and approval of water charges
- (i) Preparation of work plan
- (j) Securing right-of-way (deed of donation or permit to use) for facility sites
- (k) Selection of local contractor/s

2) Construction Phase

- (a) Provision of labor counterpart
- (b) Provision of materials
- (c) Dissemination of information
- (d) Inspection and feedback of the project activities
- (e) Provision of access to contractor/s

3) Post-Construction Phase

- (a) Payment/collection of fees; fund-raising activities
- (b) Getting water samples regularly for quality testing
- (c) Formulation of improvement plans
- (d) Preventive maintenance including cleaning of storage tank/s
- (e) Dissemination of health and hygiene information
- (f) Preparation/maintenance of the barangay maps
- (g) Auditing of finances
- (h) Attendance in community meetings
- (i) Source protection measures

- (j) Approval of major capital or rehabilitation budgets
- (k) Minor repairs and parts replacement including leak repairs
- (l) Collection and provision of information as requested by the RHU or MSL.
- (m) Safe disposal of wastewater

(3) For Level III facilities

1) Pre-Construction Phase

- a) Attend public hearings and briefings on formation of institutional arrangements (WD, cooperative, etc.) for the proposed improvement project
- b) Dissemination of information
- c) Assistance in securing right-of-way (deed of donation or sale or permit to use) for facility sites

2) Construction Phase

- (a) Dissemination of information; road traffic control, etc
- (b) Feedback on construction progress
- (c) Provision of access to contractor/s
- (d) Installation of in-house plumbing and sanitation facilities

3) Post-Construction Phase

- (a) On-time payment of water bills
- (b) Prompt reporting of leaks and illegal connections
- (c) Conservation of water
- (d) Dissemination of health and hygiene information
- (e) Attendance in further public consultation meetings
- (f) Assistance in campaigns for new service connections
- (g) Safe disposal of wastewater

9.6 Human Resources Development and Training

Policy: The training is a planned strategy to strengthen individual competencies to meet appropriate standards of excellence to achieve the goals of the program. It is a planned process of helping and enabling other people acquire attitudes, skills and knowledge by themselves. The objectives of training are individual competence, organizational effectiveness and efficiency, and national development. Training helps ensure the availability of qualified and able manpower, the shortage of which is considered as one of the major obstacles to improvements in the water supply and sanitation sector.

In planning and implementing training activities, trainers must keep in mind that there are two processes simultaneously taking place - skill/knowledge acquisition and attitude formation. To illustrate the process, a brief exercise may be conducted during the session to show the two simultaneously occurring processes - those related to task and/or subject on one hand, and those related to attitude formation on the other.

(1) The effective application of teaching and learning principles is vital to achieve optimal learning. Trainers must bear in mind the following principles:

- 1) **Perceived Purpose:** Participants should recognize why a particular topic is being discussed or presented, i.e., the relevance. This is the first element which should be established and agreed upon in any training activity.
- 2) **Graduated Sequence:** The subject matter should be presented in a logical sequence which can be followed by the trainees.
- 3) **Knowledge of Results:** At every point during a training activity, participants must know how well they are performing, i.e., feedback.
- 4) **Appropriate Practice:** If the objective of a training effort is to develop specific skills, there must be opportunities to practice and demonstrate these within the training activity.
- 5) **Individual Differentiation:** Attention must be paid to the fact that every person learns at a different pace.

(2) The Training Process

- 1) **Needs Assessment:** The first step is to determine the problem to which a training solution will be able to make an impact. A careful analysis is necessary because the training should address and focus on precisely those deficiencies in knowledge, attitudes or skills that hinder reaching certain goals. However, one must bear in mind that not all problems or deficiencies can be solved by training alone. In most cases, complementing interventions will be needed.
- 2) **Setting Learning Objectives:** In the second step, the learning objectives need to be set. Training designers shall present these objectives in behavioral terms, i.e., what should a participant be able to do at the end of the training period (not what the session will accomplish). It is necessary to formulate them with care because they also serve as criteria for evaluation at the end of the training process.
- 3) **Methods and Techniques:** Different methods of training are appropriate for different types of learning; the methodology should be appropriate with the set learning objectives. Participatory methods, like group exercises, group discussions, role plays, etc. are most effective in attitude formation. The choice of methodology is

mainly based on the learning principles and objectives. Human factors, resources available (time, facilities) and the subject area will also affect the choice.

- 4) **Evaluation of Training:** Training evaluation assesses whether a course was adequately designed and implemented to meet the set objectives. There are four levels of evaluation presented. Each level focuses on a specific area and involves a specific set of standards and evaluation tools.

- (3) **The Training Design:** Training design is more than simply putting up a schedule. It is a plan of action to be followed by a trainer in implementing his activities. It consists of:
 - 1) **Rationale:** Why set up a training program in the first place, and why would people have an interest in it?
 - 2) **Learning objectives:** Workshops should aim to develop a strong understanding of concepts like: participatory development, demand, etc. An ability to analyze and apply participatory development in their local setting or to articulate water supply and sanitation demand and supply concepts are key capacity building objectives. Methods should be more participative and consultative, i.e., allowing planners to interpret the principles with an awareness of their local conditions.
 - 3) **Assumptions about the participants' background;** define who would best benefit from the program - the target audience.
 - 4) **Curriculum:** Determine what the potential trainees need to know before they participate in the program, decide on the training methods and materials, draw up session plans and sequence the sessions logically.
 - 5) **Evaluation:** Decide how the program itself and the participants are evaluated
 - 6) **Administrative aspects:** The budget for the program, the total costs, possible costs to the trainees. Also important are things like housing (for the program itself, for facilitators and trainees), registration of trainees, logistics, etc.

Responsibilities: Needs Assessments will be conducted as the basis for the design of the courses. Participants will be selected based on their tasks and responsibilities. The PST/PWSO will establish and maintain a reference library and information/ documentation center which will include training materials and equipment to service needs of the municipalities. The DILG, in coordination with the International Training Network (ITN) - Philippines and other agencies and NGOs, will provide inputs to these training activities.

The LGU role entails not only to run courses but also to ensure that training programs take place and are effective. As an alternative, training activities may be contracted out to well-functioning water districts. NMYC training centers have been established;

NMYC can be tapped to provide testing and skill certification for caretakers. NMYC regularly conducts plumbing and pipefitting courses and the national trades certification system. Finally, there are technical and vocational schools who may be tapped to provide technical training and to award diplomas and certificates to those who undergo their programs. These schools however, do not have at this time, any special courses for water and sanitation caretakers. A program can be set up with these institutions.

External training assistance must be viewed as participation within this process. Its purpose is to guide and motivate (not replace) local trainers. Local trainers need to go through the process of, e.g., designing courses or developing materials, etc. Many learning opportunities are missed when non-local experts replace local trainers in doing need assessments, course designs, materials development, etc.

1) For staff operating Level I systems

- (a) Preparatory orientation training activities will be organized leading to the formation of associations. These community-level orientation activities will consist of briefings about the health situation, the relationship between health, water supply and sanitation. The LGU program for water and sanitation improvement will be presented, including policies and procedures for accessing technical and financial support.
- (b) Technical training of caretakers will consist of: water source protection (for deep wells, shallow wells, spring boxes and surface water intake structures); water quality protection; operation and maintenance of hardware (pumps, pipes), including simple replacements of parts; plumbing and pipefitting.
- (c) Management training will include: fee setting, bookkeeping and funds management, preparation of improvement plans and monitoring and reporting requirements. Detailed policies of the LGU will be discussed.
- (d) Current training activities and materials for the BWSAs by the DILG will be reviewed and adopted by the municipalities. UNICEF is assisting DILG in updating these materials.

2) For staff operating Level II systems

- (a) Preparatory orientation and training activities will be organized leading to the formation of associations. These community-level orientation activities will consist of briefings about the health situation, the relationship between health, water supply and sanitation. The LGU program for water and sanitation

improvement will be presented, including policies and procedures for accessing technical and financial support.

- (b) Training of technicians and operators will generally consist of: water source protection (for deep wells, spring boxes and surface water intake structures); water quality protection; water storage; chlorination; operation and maintenance of hardware (pumps, pipes), including simple replacements of parts; plumbing and pipefitting. Pump operation and electrical controls will be a major focus of this program; metering will be presented.
- (c) Management training will generally include: organization aspects, operations policy formulation, water rate computation, preparation of bills, bookkeeping and funds management, preparation of improvement plans and monitoring and reporting requirements. Detailed policies of the LGU will be discussed.
- (d) Training activities for the RWSAs prepared by LWUA will be reviewed and adopted by the municipalities.

3) For staff operating Level III systems

- (a) Technical training of engineers, technicians and operators will generally consist of: water resources conservation and protection (for deep wells, spring boxes and surface water intake structures); water quality protection; hydraulics; transmission lines; water storage; treatment and chlorination; construction inspection; and operation and maintenance of facilities. Implementation of a metering program will also be discussed. Methodologies for feasibility analysis for system expansion will be presented.
- (b) Policy and management training will include the full commercial practices system including budgeting and cost controls, bookkeeping and accounting, procurement, maintenance of stock inventories, rate formulation and capital budgeting. The policy formulation process and the various areas of policy for utility operation will be presented in detail. Long-range planning, financial analysis and review, and monitoring with reporting requirements will be discussed.
- (c) The DPWH, LWUA and MWSS have developed a comprehensive set of programs and materials for both technical and management training. Inputs from these three agencies and also from local water districts should be sought.

- 4) Training of PST/PWSO staff and municipal liaison staff: Based on the task descriptions presented, the following training programs will be required. At least one program is conducted annually for each of the workshops and courses. The programs

will explain the basic concepts and procedures. Succeeding programs will review the adopted policies and procedures and lay the bases for improving operations at the provincial and municipal levels. Municipal sector liaison staff will participate in these programs. They should be organized by the PST/PWSO; except for the Provincial Coordinators' Workshop which is best handled nationally by DILG to provide a wider base for sharing of experience among the PWSC. In addition, DILG will provide basic guidelines for the design and implementation of the workshops and courses.

- (a) The Provincial Coordinators' Workshop will be an annual activity intended to facilitate the exchange of experience among the coordinators. New national policies, opportunities and constraints will be discussed. Case studies will be presented. Sector management & technical experts will be invited to speak on current issues and trends. This will be organized by the DILG.
- (b) The Community Development Course is intended for trainers, community development specialists and municipal liaison staff. The scope of the course will include: Social marketing & public information programs, community organizing skills, training skills (needs assessment, design, implementation & monitoring).
- (c) The Technical Course seeks to acquaint technical staff at the provincial and municipal levels on the physical aspects of the sector. Its scope will generally include: water resources, overview of water supply systems (source, transmission, treatment, storage, distribution), drilling and source development, water quality protection, feasibility study and design procedures and standards, and operation and maintenance.
- (d) The Project Monitoring Seminar will provide an overview of the monitoring functions and the sector reporting requirements. The process of sector monitoring and updating the PW4SP will be presented in detail. Project monitoring procedures will also be discussed.

(4) Health and Hygiene Education

1) Policy: The LGUs shall establish hygiene education programs through appropriate methods and channels referring to on-going national program. These shall include immediate short-run programs: information campaigns; as well as long-term value formation interventions, possibly through the formal school system. If the LGUs are to attain the full economic benefits of improved water and sanitation services, household behavior and hygiene need to be addressed. Three approaches will be used:

- (a) Community-based Approach: Direct house-to-house campaigns can be implemented through the Rural Health Units, as part of their current functions.

Meetings by house "clusters" to discuss relevant health issues can also be organized. This will also be done through direct person-to-person contact with PHO staff, the municipal health staff, midwives, sanitarians and the barangay health volunteers. Special presentations can also be done during the regular meetings of community-based socio-civic clubs. Various flip charts and IEC (Information, Education and Communication) materials are already available.

- (b) **School-based Approach:** Students are the main targets of this approach, either directly or through their teachers. Special focus activities, such as Water and Sanitation Week or Nutrition Week can be introduced with programs or convocations to make the student aware of the issues and solutions. Posters, flip charts, and other audio-visual materials will be required.
- (c) **Media-based Approach:** This approach utilizes radio and print media to introduce and reinforce health messages. Many NGOs and the Philippine Information Agency (in coordination with the DOH) have developed interesting and attractive materials.

- 2) **Responsibility:** The community development and training specialists at both provincial and municipal levels will be responsible for the health and hygiene education function. The CDTSS will formulate an action plan and implementation will be done by the municipal liaison staff and other local officials. At the barangay level, its implementation will involve the close coordination among the midwives, the barangay health workers and the Committee on Health of the barangay council. Materials for this efforts have been previously developed and can be found with the various PHOs and RHUs. UNICEF has provided strong support in the preparation of these materials.
- 3) **A continuous health and hygiene education program will be launched by the LGU.** Simple and clear messages and approaches will have to be defined. These messages may include the following: Relationship among health, water supply and sanitation; sector opportunities and services available at the rural health units. The relevance of these, or other messages will have to be determined by the municipal liaison.

Chapter 10

***COST ESTIMATES FOR
FUTURE SECTOR DEVELOPMENT***



10. COST ESTIMATES FOR FUTURE SECTOR DEVELOPMENT

10.1 General

The total investment cost required in the two phases was studied for implementation of the future requirements identified in Chapter 8 and Chapter 9. The investment cost is defined to include direct cost for construction/rehabilitation of required facilities and sector management, as well as physical and price contingencies. Cost requirements for the equipment and vehicle are discussed as a reference to the LGUs. In addition, recurrent cost is estimated for the operation and maintenance of facilities.

Conditions and assumptions to come up with investment cost were established covering all sub-sector components referring to the National Sector Master Plan and current standards of relevant sector agencies (DPWH, DOH and LWUA). Of the total investment cost required, only construction cost for sector components by municipality was included in this Chapter. The total investment cost is presented in Chapter 11 as a total requirement of the province.

With regard to construction cost, unit construction cost per person/household/facility was first prepared under contract-out basis for respective sub-sector component facilities at 1995 price level (refer to Supporting Report).

Recurrent cost was also included in this Chapter taking into account regular operation, spare parts and equipment replacement for sector components concerned.

10.2 Assumptions for Cost Estimates

(1) Unit Construction Cost

Unit construction cost per person (household or facility) of each sector component was prepared based on the current standard unit cost of relevant sector agencies and typical standards developed for this PW4SP as contract-out basis at 1995 price level. Referred cost data are urban water supply of LWUA, rural water supply of DPWH and sanitation of DOH. For price adjustment of construction materials, the NSO price index of 1994 to 1995 was referred to.

Unit construction cost consists of, in general, direct cost (mobilization/demobilization, material and labor), indirect cost (profit and VAT of contractor) and government expense

(detailed engineering, institutional development and water quality analysis-when deemed necessary).

Freight cost of construction materials excluding indigenous materials, i.e., sand and gravel, was counted for sanitation and rural water supply in consideration of the distance from Manila. The cost is estimated at fixed percentage (9%) based on the standard practice being adopted by sector agencies.

Table 10.2.1 shows a summary of unit construction cost and their descriptions are given below (details are referred to Supporting Report).

Urban water supply:

- Unit cost for three different sizes of Level III system covering served population of 5,000, 10,000 and 15,000.

Rural water supply:

- Unit cost for four types of Level I wells (shallow well at 18 m in depth and deep wells at 30, 50 and 70 m in depth).
- Unit cost for Level II system to cover 600 served population.

Sanitation:

- Household toilet:
Unit cost for three types of sanitary toilets (flush, pour-flush and VIP) to cover one served household in urban or rural areas. Cost of flush toilet includes costs for demolition, water closet, water line and a superstructure made of durable construction materials.
- Public school toilet:
Unit cost for one facility with 5 toilet bowls to cover 250 served students.
- Public toilet:
Unit cost for one facility with 6 toilet bowls.
- Well disinfection:
 - unit disinfection cost per well based on DOH standard cost.
 - to be applied to all existing and new wells once a year.

Table 10.2.1 Unit Cost of Facilities by Type and Service Level

| Description | Urban Water Supply (Level II) | | | | | | Rural Water Supply (Level I) | | | | | | Sanitation | | | |
|--|-------------------------------|-------------------|------------------|-------------------|-------------------|---------------|------------------------------|---------|--------|------------------|-------------|------------|----------------------|---------------|-------------------------------|----------------|
| | New System | | Expansion | | Level II | Shallow Wells | Deep Well | | | Household Toilet | | | Public School Toilet | Public Toilet | Disinfection of Level I Wells | Urban Sewerage |
| | 5,000 Population | 10,000 Population | 5,000 Population | 10,000 Population | | | 15,000 Population | 30 m | 50 m | 70 m | Flush | Pour Flush | | | | |
| | 3,000 Population | 10,000 Population | 5,000 Population | 10,000 Population | 15,000 Population | 30 m | 50 m | 70 m | Flush | Pour Flush | VIP Latrine | | | | | |
| Unit Construction Cost per Facility (Pesos) | 20,081,250 | 30,418,750 | 45,648,750 | 19,856,250 | 43,818,750 | 119,245 | 175,640 | 235,134 | 24,825 | 37,100 | 13,300 | 8,400 | 297,020 | 317,259 | 70 | N.A. |
| Service Coverage | Served Population | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 250 | N.A. | N.A. | N.A. |
| | Served Households | 1,000 | 3,000 | 1,000 | 2,000 | 3,000 | 15 | 15 | 15 | 1 | 1 | 1 | N.A. | N.A. | N.A. | N.A. |
| Unit Cost | Pesos/Person | 4,000 | 3,000 | 3,700 | 2,900 | 2,900 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 1,200 | N.A. | N.A. | 7,500 |
| | Pesos/Household | N.A. | N.A. | N.A. | N.A. | N.A. | 10,500 | 17,300 | 25,200 | 37,100 | 13,300 | 8,400 | N.A. | N.A. | N.A. | N.A. |
| Rehabilitation Cost of Level I Deep Well (Pesos) | N.A. | N.A. | N.A. | N.A. | N.A. | 31,667 | | | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. |

Urban Sewerage:

- Unit cost per served population. Preliminary estimates derived from the Philippine National Urban Sewerage and Sanitation Strategy and Feasibility Studies report.

(2) Unit Cost of Equipment

Unit cost of equipment shown in Table 10.2.2 was prepared as reference information based on the standard unit cost and recent procurement experience of the relevant sector agencies (details are referred to Supporting Report).

Table 10.2.2 Unit Cost of Equipment and Vehicle

| Name of Equipment | Unit Cost (Peso 1,000) |
|---------------------------------------|-----------------------------------|
| Truck-mounted rotary drilling rig | 17,370 |
| Truck-mounted percussion drilling rig | 10,280 |
| Well rehabilitation equipment | 138 |
| Service truck with crane | 1,175 |
| Support vehicle (Pick-up with winch) | 500 |
| Refuse collection truck | 1,380 |

(3) Sector Management Cost

Sector management cost consists of:

- engineering studies (F/S, D/D and construction supervision) for water supply, public toilet and school toilet facilities.
- community development and training including health & hygiene education and logistic support.

Cost of engineering studies was estimated based on the fixed percentages to the total construction cost; 9% for F/S and D/D and 4% for construction supervision.

Community development and training with logistic support was also estimated on the same manner; 12% of respective construction costs for rural water supply and sanitation, and 3% of construction cost for urban water supply.

(4) Recurrent Cost

Recurrent cost was estimated for water supply and sanitation (school and public toilets) facilities to cover the regular operating cost and the cost for spare parts and equipment

replacement based on the following cost assumptions, while household toilet is assumed to be maintained by the owner.

Regular operating cost normally includes salaries of operation staff, electricity, fuel and chemicals. Due to the nature of this cost, it is only applied to urban water supply (Level III system). As a typical unit cost being applied to existing PW4SPs referring to LWUA data, 365 Pesos/household/year was employed.

Cost for spare parts and equipment replacement was considered by different service level as described below.

Level III system:

- Mechanical and electrical equipment has normally a life cycle of 8 to 12 years and is considered in depreciation cost, i.e., 10% per annum. Assuming that the equipment cost comprise 10% of construction cost, annual depreciation will be 1% of the construction cost.
- Accordingly, cost of spare parts was assumed to be 10% of the equipment cost or equivalent to 1% of the construction cost.
- As a whole, 2% of the construction cost was applied for the cost of spare parts and equipment replacement.

Level II system:

- Operation and maintenance (O&M) cost of Level II system utilizing spring sources includes repair/replacement of pipelines and communal faucets and salaries of maintenance staff.
- A unit cost of 100 Pesos/household/year was assumed for cost estimates.

Level I system:

- O&M cost of Level I facility simply includes spare parts of handpump and caretaker.
- A unit cost of 50 Pesos/household/year was assumed for cost estimates.

School and public toilets:

- O&M cost includes the salaries of maintenance staff, cost of pumping sludge from septic tanks (periodically) and rehabilitation cost (for depreciation).
- For cost estimates, 5% of the construction cost was applied per facility per year.

Management cost:

- Management cost of water supply, sewerage and sanitation sector is part of the cost required for public services of LGUs mainly consisting of salaries of officers and workers and normally included in the annual budget of each LGU. The rest of management cost, such as equipment for information processing and dissemination was considered as part of logistic support under the sector management cost. Owing to the nature of this cost item, the management cost pertaining to salaries of officers/workers depends largely on the population size and institutional set-up of each LGU.
- Management cost was not estimated in this PW4SP considering the above mentioned reasons.

10.3 Cost of Required Facilities and Equipment

10.3.1 Cost of Required Facilities

The construction cost of required facilities as public investment of LGUs was summarized in Table 10.3.1 by sub-sector by municipality for target years. In this regard, the construction cost of household toilets is limited to the procurement and distribution of toilet bowl for pour-flush toilets as being implemented by DOH under the FW4SP (refer to over-all construction cost requirements, Supporting Report).

During the medium-term development period, a total of 236 million Pesos will be required for construction of required facilities. Of the requirements, 60% or 141 million Pesos will be necessary only for rural water supply, while only 2% or 4 million Pesos will be for urban sanitation.

Table 10.3.1 Construction Cost of Required Facilities by Municipality

(Unit: 1,000 Pesos)

| Municipalities | Phase I (2000) Requirements | | | | | | Phase II (2010) Requirements | | | | | | Grand Total | | |
|----------------|-----------------------------|------------|-----------|--------------|------------|-----------|------------------------------|------------|-----------|--------------|------------|-----------|-------------|--------|--------|
| | Urban Area | | | Rural Area | | | Urban Area | | | Rural Area | | | | | |
| | Water Supply | Sanitation | Sub-total | Water Supply | Sanitation | Sub-total | Water Supply | Sanitation | Sub-total | Water Supply | Sanitation | Sub-total | | | |
| Alilem | 1,452 | 30 | 1,482 | 3,060 | 173 | 3,233 | 4,715 | 4,451 | 635 | 6,015 | 1,347 | 11,101 | 256 | 1,603 | 12,704 |
| Banayoyo | 200 | 0 | 200 | 490 | 8 | 498 | 698 | 3,171 | 317 | 3,489 | 1,713 | 6,977 | 639 | 2,352 | 9,329 |
| Bantay | 7,067 | 0 | 7,067 | 6,616 | 194 | 6,810 | 13,877 | 23,635 | 891 | 43,070 | 8,404 | 67,596 | 2,648 | 11,052 | 78,648 |
| Burgos | 1,776 | 45 | 1,821 | 3,091 | 104 | 3,195 | 5,016 | 4,492 | 0 | 6,373 | 2,938 | 10,865 | 939 | 3,877 | 14,742 |
| Cabugao | 0 | 0 | 0 | 1,610 | 303 | 1,913 | 1,913 | 22,980 | 987 | 33,711 | 10,550 | 57,678 | 2,475 | 13,025 | 70,703 |
| Candon | 7,760 | 773 | 8,533 | 16,403 | 4,288 | 20,691 | 29,224 | 17,647 | 1,053 | 30,835 | 12,976 | 49,535 | 4,908 | 17,884 | 67,419 |
| Caoyan | 4,414 | 71 | 4,485 | 6,616 | 306 | 6,922 | 11,407 | 16,562 | 317 | 28,945 | 4,828 | 45,824 | 361 | 5,189 | 51,013 |
| Cervantes | 1,928 | 635 | 2,563 | 2,081 | 1,568 | 3,649 | 6,212 | 8,932 | 86 | 11,125 | 3,672 | 20,143 | 1,169 | 4,841 | 24,984 |
| Galimuyod | 48 | 5 | 53 | 122 | 756 | 878 | 931 | 1,724 | 0 | 1,840 | 2,693 | 3,564 | 869 | 3,562 | 7,126 |
| G. del Pilar | 0 | 0 | 0 | 0 | 38 | 38 | 38 | 274 | 639 | 2,592 | 857 | 3,505 | 112 | 969 | 4,474 |
| Lidlidda | 0 | 4 | 4 | 0 | 3 | 3 | 7 | 5,121 | 635 | 5,322 | 857 | 11,078 | 149 | 1,006 | 12,084 |
| Magsingal | 2,152 | 8 | 2,160 | 5,179 | 1,072 | 6,251 | 8,411 | 15,431 | 0 | 22,513 | 8,940 | 37,944 | 1,985 | 10,925 | 48,869 |
| Nagbukel | 756 | 0 | 756 | 1,010 | 141 | 1,151 | 1,907 | 2,305 | 317 | 3,124 | 1,102 | 5,746 | 169 | 1,271 | 7,017 |
| Narvacan | 2,287 | 0 | 2,287 | 20,075 | 700 | 20,775 | 23,062 | 6,046 | 317 | 12,016 | 11,732 | 18,379 | 3,108 | 14,860 | 33,239 |
| Quirino | 888 | 0 | 888 | 4,036 | 238 | 4,276 | 5,164 | 4,851 | 317 | 5,891 | 1,959 | 11,059 | 813 | 2,772 | 13,831 |
| Salcedo | 692 | 0 | 692 | 1,837 | 302 | 2,139 | 2,831 | 4,880 | 317 | 5,738 | 2,938 | 10,935 | 746 | 3,684 | 14,619 |
| San Emilio | 0 | 412 | 412 | 244 | 863 | 1,107 | 1,519 | 9,457 | 317 | 9,826 | 1,347 | 19,600 | 230 | 1,577 | 21,177 |

Table 10.3.1 Construction Cost of Required Facilities by Municipality (Cont'd.)

Unit: 1,000 Pesos

| Municipalities | Phase I (2000) Requirements | | | | | | | | | | Phase II (2010) Requirements | | | | | | | | | | | |
|------------------|-----------------------------|------------|-----------|--------------|------------|------------|--------------|------------|-----------|-------------|------------------------------|--------------|------------|-----------|----------|-----------|--------------|------------|-----------|-------------|--|-------------|
| | Urban Area | | | | | Rural Area | | | | | Grand Total | Urban Area | | | | | Rural Area | | | | | Grand Total |
| | Water Supply | Sanitation | Sub-total | Water Supply | Sanitation | Sub-total | Water Supply | Sanitation | Sub-total | Grand Total | | Water Supply | Sanitation | Sub-total | Sewerage | Sub-total | Water Supply | Sanitation | Sub-total | Grand Total | | |
| San Esteban | 412 | 0 | 412 | 2,448 | 85 | 2,533 | 2,945 | 317 | 3,205 | 6,227 | 2,081 | 589 | 2,670 | | | 2,081 | | | 8,897 | | | |
| San Tidelonso | 476 | 6 | 482 | 1,251 | 6 | 1,257 | 1,739 | 0 | 4,365 | 8,128 | 1,967 | 682 | 2,649 | | | 1,967 | | | 10,777 | | | |
| San Juan | 1,300 | 0 | 1,300 | 4,470 | 303 | 4,773 | 6,073 | 0 | 14,498 | 27,256 | 9,120 | 1,666 | 10,786 | | | 9,120 | | | 38,042 | | | |
| San Vicente | 40 | 0 | 40 | 5,007 | 906 | 5,913 | 5,953 | 0 | 5,088 | 9,950 | 4,828 | 1,749 | 6,577 | | | 4,828 | | | 16,527 | | | |
| Santa | 722 | 0 | 722 | 5,706 | 67 | 5,773 | 6,495 | 0 | 7,388 | 10,984 | 5,543 | 1,058 | 6,601 | | | 5,543 | | | 17,585 | | | |
| Santa Catalina | 704 | 0 | 704 | 3,197 | 727 | 4,124 | 4,828 | 0 | 5,300 | 9,747 | 5,067 | 1,143 | 6,150 | | | 5,067 | | | 15,897 | | | |
| Santa Cruz | 3,744 | 361 | 4,105 | 8,079 | 2,449 | 10,528 | 14,633 | 624 | 19,031 | 34,514 | 8,814 | 3,455 | 12,269 | | | 8,814 | | | 46,783 | | | |
| Santa Lucia | 784 | 406 | 1,190 | 6,366 | 3,592 | 9,958 | 11,148 | 0 | 9,621 | 14,697 | 6,243 | 2,566 | 8,809 | | | 6,243 | | | 23,506 | | | |
| Santa Maria | 5,320 | 0 | 5,320 | 12,364 | 45 | 12,409 | 17,729 | 317 | 15,542 | 25,905 | 7,100 | 2,186 | 9,286 | | | 7,100 | | | 35,191 | | | |
| Santiago | 1,384 | 317 | 1,701 | 3,550 | 1,294 | 4,844 | 6,545 | 1 | 10,176 | 17,351 | 4,285 | 1,995 | 6,280 | | | 4,285 | | | 23,631 | | | |
| Santo Domingo | 1,058 | 0 | 1,058 | 2,683 | 65 | 2,748 | 3,806 | 317 | 12,593 | 23,884 | 9,298 | 1,997 | 11,295 | | | 9,298 | | | 35,179 | | | |
| Sigay | 0 | 0 | 0 | 0 | 40 | 40 | 40 | 0 | 0 | 317 | 368 | 131 | 499 | | | 368 | | | 816 | | | |
| Smrit | 0 | 317 | 317 | 5,721 | 408 | 6,129 | 6,446 | 317 | 12,330 | 20,839 | 10,728 | 1,579 | 12,307 | | | 10,728 | | | 33,146 | | | |
| Sugpon | 0 | 54 | 54 | 612 | 102 | 714 | 768 | 655 | 4,161 | 8,803 | 612 | 108 | 720 | | | 612 | | | 9,523 | | | |
| Suvo | 1,340 | 20 | 1,360 | 2,081 | 873 | 2,954 | 4,314 | 643 | 7,636 | 14,391 | 2,326 | 383 | 2,709 | | | 2,326 | | | 17,100 | | | |
| Tagudin | 107 | 41 | 148 | 4,651 | 1,657 | 6,308 | 6,456 | 643 | 20,696 | 31,322 | 8,569 | 2,346 | 10,915 | | | 8,569 | | | 42,237 | | | |
| Vigan (Capital) | 18,856 | 431 | 19,287 | 0 | 0 | 19,287 | 19,287 | 694 | 176,580 | 273,429 | 0 | 0 | 0 | | | 0 | | | 273,429 | | | |
| Provincial Total | 67,667 | 3,936 | 71,603 | 140,858 | 23,676 | 164,534 | 236,137 | 11,970 | 560,635 | 929,273 | 165,762 | 45,209 | 210,971 | | | 165,762 | | | 1,140,244 | | | |

10.3.2 Cost of Required Equipment and Vehicle

The procurement cost of required equipment was estimated as shown in Table 10.3.2 (details are referred to Supporting Report)

Table 10.3.2 Cost of Equipment and Vehicle

| Name of Equipment | Unit Cost (Peso 1,000) | Quantity (set) | Cost (Peso 1,000) |
|---------------------------------------|---------------------------|-------------------|----------------------|
| Truck-mounted rotary drilling rig | 17,370 | 7 | 121,590 |
| Truck-mounted percussion drilling rig | 10,280 | 10 | 102,800 |
| Well rehabilitation equipment | 138 | 2 | 276 |
| Service truck with crane | 1,175 | 17 | 19,975 |
| Support vehicle (Pick-up with winch) | 500 | 3 | 1,500 |
| Refuse collection truck | 1,380 | 30 | 41,400 |
| Total Equipment Cost | | | 287,541 |

10.4 Recurrent Cost

Recurrent cost is estimated at 1995 price level as a provincial total of each sub-sector covering existing facilities and additional facilities to be constructed during the medium-term development as shown in Table 10.4.1.

In the year 2000, the recurrent cost will increase to 17.6 million Pesos/year from 13.0 million Pesos/year in 1995, which is equivalent to 36% increase from the base year corresponding to the implementation of the medium-term development.

Table 10.4.1 Recurrent Cost

Unit: 1,000 Pesos

| Sector Component | Item | Base Year Existing Facilities | 1996 | 1997 | 1998 | 1999 | 2000 | Total (1996-2000) |
|-------------------------|-----------------------|-------------------------------|---------------|---------------|---------------|---------------|---------------|-------------------|
| Urban Water Supply | Operating Cost | 2,828 | 2,828 | 3,182 | 3,713 | 4,244 | 4,598 | 13,035 |
| | Spare Parts/Equipment | 1,601 | 1,601 | 1,872 | 2,278 | 2,684 | 2,955 | 11,390 |
| Rural Water Supply | Level II | 349 | 384 | 419 | 419 | 419 | 419 | 2,060 |
| | Level I | 3,394 | 3,483 | 3,647 | 3,811 | 3,975 | 4,139 | 19,055 |
| Sanitation | Public School Toilets | 5,259 | 5,387 | 5,621 | 5,855 | 6,089 | 6,323 | 29,275 |
| | Public Toilets | 420 | 429 | 446 | 463 | 480 | 497 | 2,315 |
| Provincial Total | | 12,961 | 13,222 | 14,211 | 15,433 | 16,655 | 17,609 | 77,130 |

Note: Recurrent cost of each year includes that of base year existing facilities.



Chapter 11

FINANCIAL ARRANGEMENTS



11. Financial Arrangements

11.1 General

Financial arrangements to attain medium-term (Phase I) target are sought taking account of potential funds. However, quantitative study is limited to the use of projected Internal Revenue Allotment (IRA). In this connection, this Chapter addresses to identify financial shortfall with reference to available IRA for this sector and to seek comprehensive logistics in terms of acquisition of various funds, augmentation of current practices in the Government assistance to this sector, and effective investments and cost recovery.

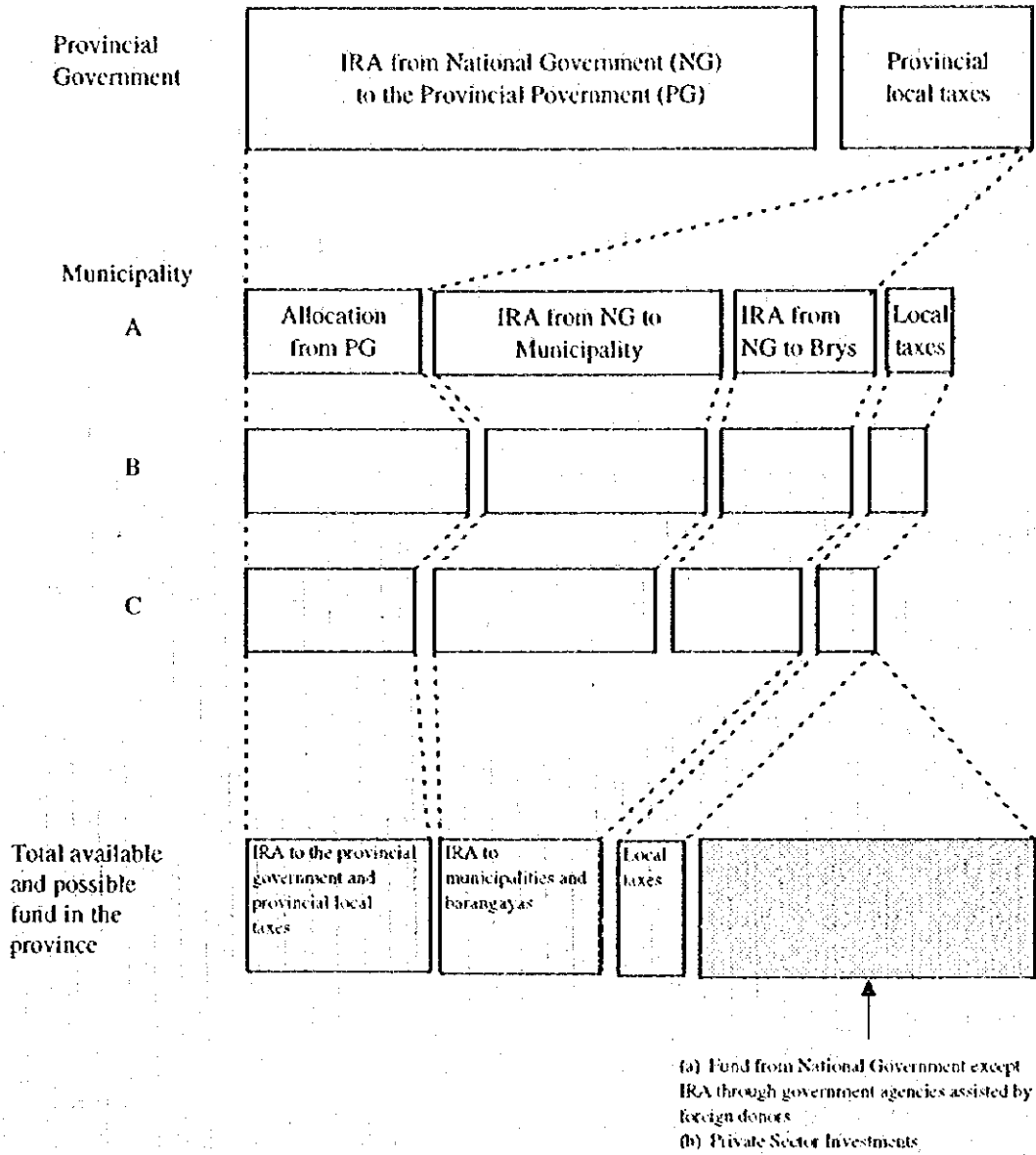
Available funds (IRA) during the medium-term development period are projected in use of computer-based programs that allow for the future application to include additional funds available. Figure 11.1.1 shows sector budget allocation in the different administrative levels to come up with total funds available in the province. Figure 11.1.2 illustrates manner of sector fund allocation to respective municipalities from the national and provincial governments with a detailed study flow availing IRA. Interfaces between provincial government and municipalities/barangays are also presented in the same figure.

Distribution of IRA to respective municipalities is contemplated in assumption of various factors based on the experiences as of 1994. However, the structure and application of IRA are under review by the national government. Accordingly, the study results on IRA are tentative and subject to change.

11.2 Projection of IRA

The projection of IRA to the relevant sector for Phase I period is made covering different administrative levels. Current manner of allocation by the national government is directed to three different governmental levels; province, municipality and barangay. Municipal fund available for this sector is calculated as a sum of municipal and provincial allotments. Figure 11.2.1 shows the calculation procedure with assumptions and Table 11.2.1 and 11.2.2 present calculation results.

Figure 11.1.1 Sector Budget Allocation



Notes: (1) Budget from different sources in the figure above are those shared to water supply and sanitation sector from allotted amount for overall sectors.

(2) Shaded portion above is the potential fund source to be negotiated/arranged to meet target requirements.

Figure 11.1.2 GENERAL FLOW OF FINANCIAL ARRANGEMENTS FOR RELEVANT SECTOR DEVELOPMENT

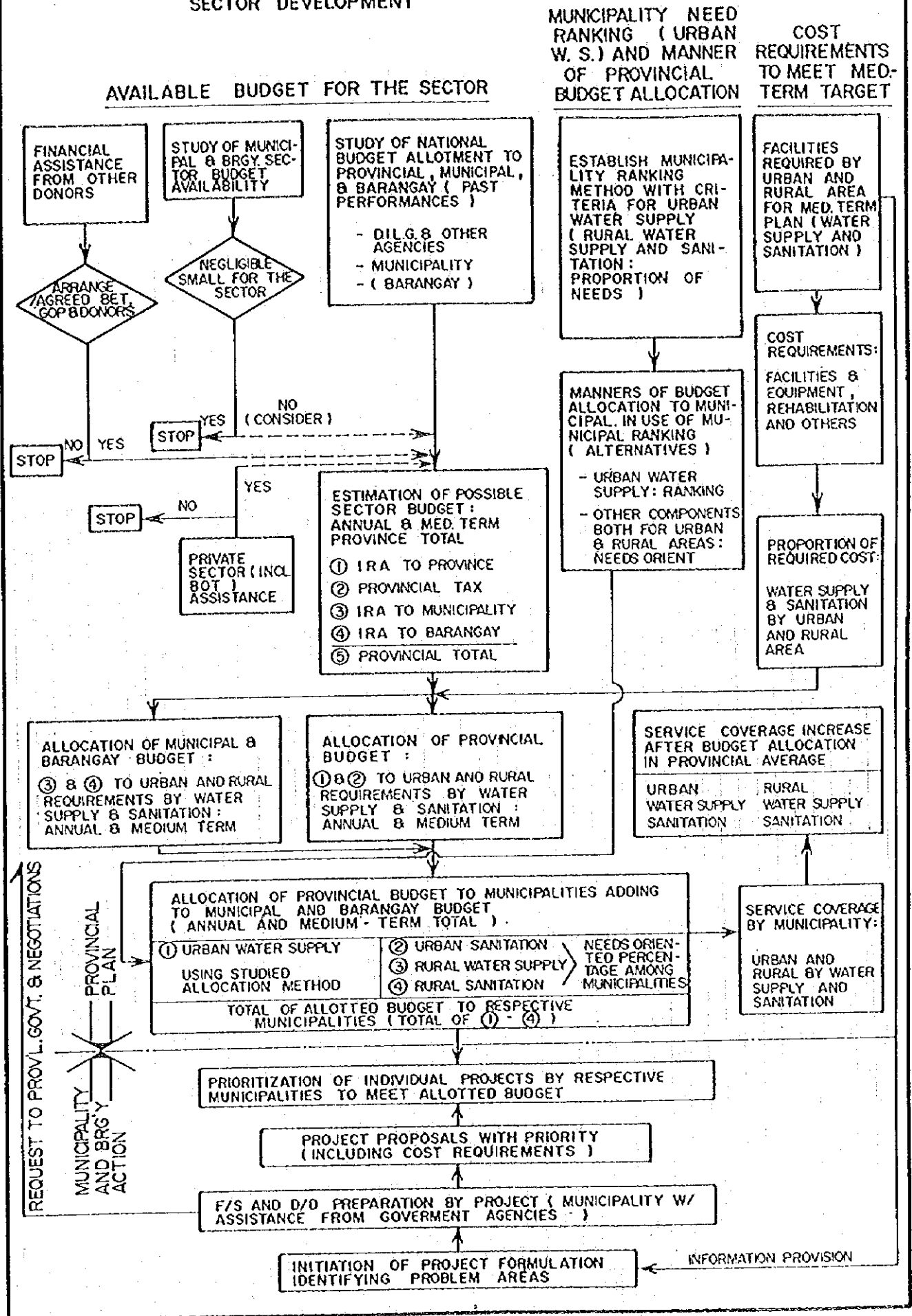
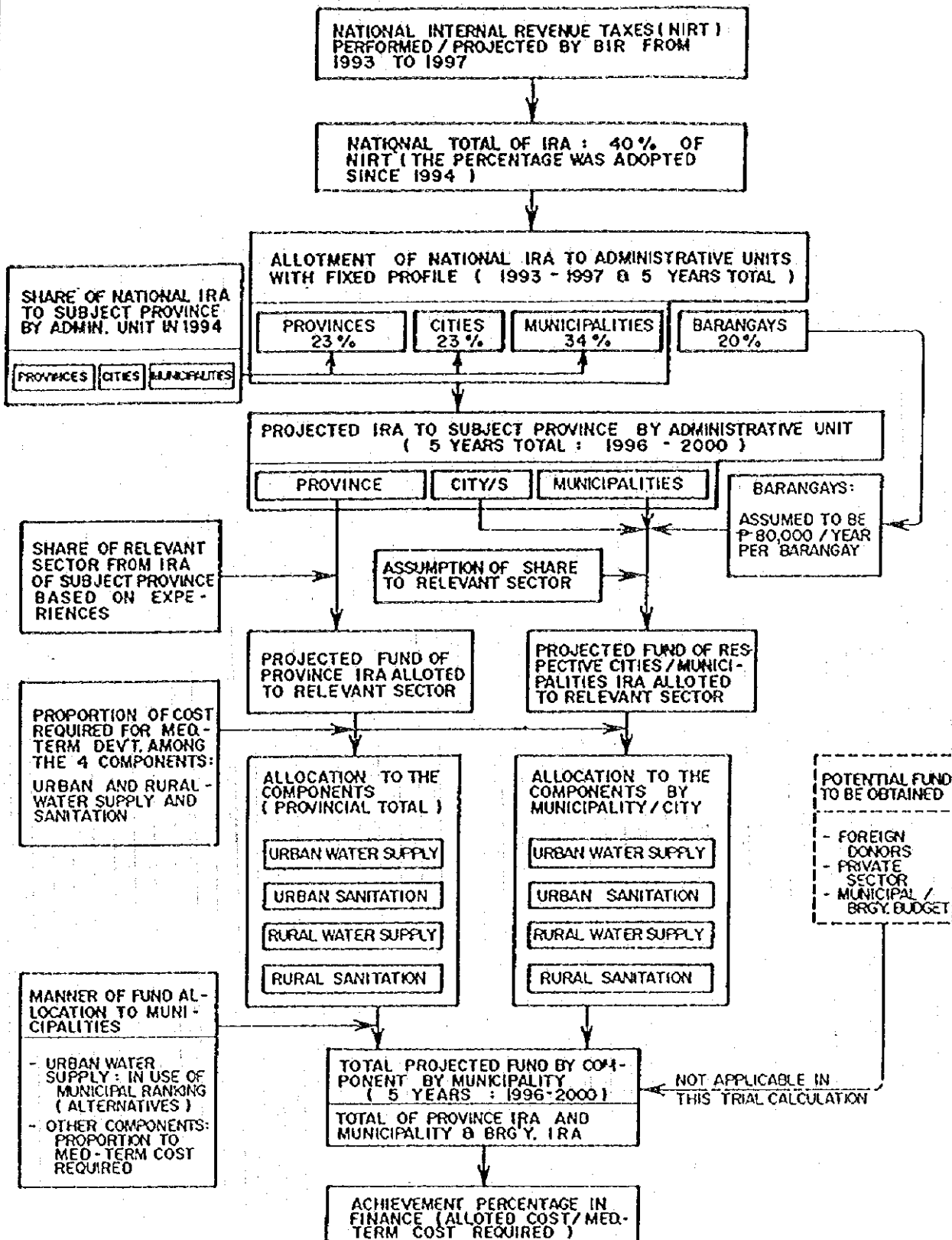


Figure 11.2.1 TRIAL ALLOCATION OF INTERNAL REVENUE ALLOTMENT (IRA) TO MUNICIPALITIES FOR RELEVANT SECTOR DEVELOPMENT



NOTE: BIR - BUREAU OF INTERNAL REVENUE (DOF)
 NIRT (1993 - 1997) IS THE BASIS OF NATIONAL TOTAL OF IRA (1996 - 2000)
 POTENTIAL FUND: NEEDS OF ADDITIONAL FUND ARE CONSIDERABLE. THUS REFERENCE INFORMATION IS SHOWN.

Table 11.2.1 Projected Internal Revenue Allotment for Medium-Term Sector Development

Unit: 1,000 Pesos

| | 1996 | 1997 | 1998 | 1999 | 2000 | Total |
|--|------------|------------|------------|------------|-------------|-------------|
| 1 40 % of Actual/Projected National Internal Revenue Taxes of the 3rd Fiscal Year preceding the current year | 58,640,000 | 69,710,000 | 81,490,000 | 98,012,000 | 110,188,000 | 418,040,000 |
| 2 Internal Revenue Allotment to all LGUs | | | | | | |
| (a) provinces (23%) | 13,487,200 | 16,033,300 | 18,742,700 | 22,542,760 | 25,343,240 | 96,149,200 |
| (b) cities (23%) | 13,487,200 | 16,033,300 | 18,742,700 | 22,542,760 | 25,343,240 | 96,149,200 |
| (c) municipalities (34%) | 19,937,600 | 23,701,400 | 27,706,600 | 33,324,080 | 37,463,920 | 142,133,600 |
| (d) barangays (20%) | 11,728,000 | 13,942,000 | 16,298,000 | 19,602,400 | 22,037,600 | 83,608,000 |
| (e) total LGUs | 58,640,000 | 69,710,000 | 81,490,000 | 98,012,000 | 110,188,000 | 418,040,000 |
| 3 Projected IRA to Subject Province by Administrative Unit | | | | | | |
| (a) province | 153,824 | 182,863 | 213,764 | 257,105 | 289,045 | 1,096,601 |
| (b) municipalities including barangays | 293,556 | 381,137 | 435,174 | 510,965 | 566,819 | 2,187,651 |
| Ahlem | 7,680 | 8,993 | 10,391 | 12,352 | 13,797 | 53,214 |
| Banayoyo | 6,347 | 7,334 | 8,384 | 9,857 | 10,942 | 42,864 |
| Bantay | 13,052 | 15,002 | 17,078 | 19,989 | 22,134 | 87,255 |
| Burgos | 8,231 | 9,392 | 10,628 | 12,361 | 13,638 | 54,249 |
| Cabugao | 13,057 | 15,023 | 17,116 | 20,051 | 22,214 | 87,461 |
| Candon | 17,139 | 19,740 | 22,508 | 26,390 | 29,251 | 115,027 |
| Caoayan | 8,700 | 10,070 | 11,528 | 13,574 | 15,081 | 58,953 |
| Cervantes | 10,749 | 12,582 | 14,532 | 17,268 | 19,284 | 74,414 |
| Galimuyod | 7,634 | 8,713 | 9,860 | 11,470 | 12,657 | 50,334 |
| G. del Pilar | 6,348 | 7,440 | 8,603 | 10,233 | 11,435 | 44,059 |
| Lidlidda | 5,416 | 6,272 | 7,184 | 8,462 | 9,403 | 36,737 |
| Magsingal | 12,049 | 13,871 | 15,809 | 18,528 | 20,531 | 80,788 |
| Nagbukel | 5,859 | 6,784 | 7,768 | 9,148 | 10,165 | 39,724 |
| Narvacan | 15,075 | 17,408 | 19,889 | 23,371 | 25,936 | 101,679 |
| Quirino | 8,528 | 10,858 | 12,572 | 14,975 | 16,745 | 63,679 |
| Salcedo | 5,897 | 6,691 | 7,875 | 9,537 | 10,761 | 48,762 |
| San Emilio | 6,740 | 8,653 | 10,007 | 11,906 | 13,305 | 50,611 |
| San Esteban | 5,201 | 6,982 | 8,027 | 9,492 | 10,572 | 40,275 |
| San Ildefonso | 4,774 | 6,875 | 7,835 | 9,180 | 10,171 | 38,835 |
| San Juan | 8,698 | 12,900 | 14,647 | 17,098 | 18,904 | 72,246 |
| San Vicente | 5,838 | 7,500 | 8,673 | 10,318 | 11,530 | 43,861 |
| Santa | 6,917 | 10,303 | 11,692 | 13,641 | 15,077 | 57,630 |
| Santa Catalina | 6,140 | 8,019 | 9,252 | 10,982 | 12,257 | 46,651 |
| Santa Cruz | 10,994 | 16,989 | 19,197 | 22,295 | 24,578 | 94,052 |
| Santa Lucia | 8,680 | 13,039 | 14,783 | 17,229 | 19,031 | 72,762 |
| Santa Maria | 9,438 | 13,860 | 15,756 | 18,415 | 20,374 | 77,842 |
| Santiago | 7,676 | 11,045 | 12,587 | 14,750 | 16,344 | 62,403 |
| Santo Domingo | 8,945 | 13,514 | 15,311 | 17,831 | 19,688 | 75,289 |
| Sigay | 5,499 | 7,097 | 8,202 | 9,752 | 10,893 | 41,444 |
| Sinait | 9,496 | 14,809 | 16,717 | 19,392 | 21,364 | 81,778 |
| Sugpon | 6,767 | 8,524 | 9,884 | 11,790 | 13,195 | 50,160 |
| Suyo | 7,061 | 9,034 | 10,453 | 12,442 | 13,908 | 52,899 |
| Tagudin | 10,526 | 15,953 | 18,068 | 21,033 | 23,219 | 88,799 |
| Vigan (Capital) | 12,405 | 17,867 | 20,359 | 23,854 | 26,430 | 100,915 |
| (c) Provincial total | 447,380 | 564,000 | 648,938 | 768,069 | 855,864 | 3,284,251 |

Table 11.2.1 Projected Internal Revenue Allotment for Medium-Term Sector Development (Cont'd.)

Unit: 1,000 Pesos

| | 1996 | 1997 | 1998 | 1999 | 2000 | Total |
|---|--------|--------|--------|--------|--------|---------|
| 4 Projected fund of IRA to Relevant Sector by Administrative Unit | | | | | | |
| (a) province | 6,153 | 7,315 | 8,551 | 10,284 | 11,562 | 43,864 |
| (b) municipalities including barangays | 11,742 | 15,245 | 17,404 | 20,439 | 22,673 | 87,503 |
| Alilem | 307 | 360 | 416 | 494 | 552 | 2,129 |
| Banayoyo | 254 | 293 | 335 | 394 | 438 | 1,714 |
| Bantay | 522 | 600 | 683 | 800 | 885 | 3,491 |
| Burgos | 329 | 376 | 425 | 494 | 546 | 2,169 |
| Cabugao | 522 | 601 | 685 | 802 | 889 | 3,499 |
| Candon | 686 | 790 | 900 | 1,056 | 1,170 | 4,601 |
| Caoyan | 348 | 403 | 461 | 543 | 603 | 2,358 |
| Cervantes | 430 | 503 | 581 | 691 | 771 | 2,977 |
| Galimuyod | 305 | 349 | 394 | 459 | 506 | 2,013 |
| G. del Pilar | 254 | 298 | 344 | 409 | 457 | 1,762 |
| Lidlidda | 217 | 251 | 287 | 338 | 376 | 1,469 |
| Magsingal | 482 | 555 | 632 | 741 | 821 | 3,231 |
| Nagbukel | 234 | 271 | 311 | 366 | 407 | 1,589 |
| Narvacan | 603 | 696 | 796 | 935 | 1,037 | 4,068 |
| Quirino | 341 | 434 | 503 | 599 | 670 | 2,547 |
| Salcedo | 236 | 348 | 395 | 461 | 510 | 1,950 |
| San Emilio | 270 | 346 | 400 | 476 | 532 | 2,024 |
| San Esteban | 208 | 279 | 321 | 380 | 423 | 1,611 |
| San Ildefonso | 191 | 275 | 313 | 367 | 407 | 1,553 |
| San Juan | 348 | 516 | 586 | 684 | 756 | 2,890 |
| San Vicente | 234 | 300 | 347 | 413 | 461 | 1,755 |
| Santa | 277 | 412 | 468 | 546 | 603 | 2,306 |
| Santa Catalina | 246 | 321 | 370 | 439 | 490 | 1,866 |
| Santa Cruz | 440 | 680 | 768 | 892 | 983 | 3,762 |
| Santa Lucia | 347 | 522 | 591 | 689 | 761 | 2,910 |
| Santa Maria | 378 | 554 | 630 | 737 | 815 | 3,114 |
| Santiago | 307 | 442 | 503 | 590 | 654 | 2,496 |
| Santo Domingo | 358 | 541 | 612 | 713 | 788 | 3,011 |
| Sigay | 220 | 284 | 328 | 390 | 436 | 1,658 |
| Sinait | 380 | 592 | 669 | 776 | 855 | 3,272 |
| Sugpon | 271 | 341 | 395 | 472 | 528 | 2,006 |
| Suyo | 282 | 361 | 418 | 498 | 556 | 2,116 |
| Tagudin | 421 | 638 | 723 | 841 | 929 | 3,552 |
| Vigan (Capital) | 496 | 715 | 814 | 954 | 1,057 | 4,036 |
| (c) Province Total | 17,895 | 22,560 | 25,955 | 30,723 | 34,235 | 131,368 |

Sources:

- (1) Bureau of Internal Revenue and Bureau of Local Government Finance, DOF, for the projection of National Internal Revenue Internal Revenue Allotment
- (2) JICA Study Team for other projections.

Table 11.2.2 Projected Allotment of IRA to the Relevant Sector by Component, 1996 -2000

Unit: 1,000 Pesos

| | Urban Water Supply | Rural Water Supply | Urban Sanitation | Rural Sanitation | Total |
|-------------------|--------------------|--------------------|------------------|------------------|---------|
| 1. Province | 12,721 | 25,880 | 877 | 4,386 | 43,864 |
| 2. Municipalities | 19,567 | 50,563 | 2,625 | 14,748 | 87,503 |
| Alilem | 656 | 1,382 | 14 | 78 | 2,129 |
| Banayoyo | 491 | 1,203 | 0 | 20 | 1,714 |
| Bantay | 1,778 | 1,664 | 0 | 49 | 3,491 |
| Burgos | 768 | 1,337 | 19 | 45 | 2,169 |
| Cabugao | 0 | 2,945 | 0 | 554 | 3,499 |
| Candon | 1,222 | 2,583 | 122 | 675 | 4,601 |
| Caoayan | 912 | 1,368 | 15 | 63 | 2,358 |
| Cervantes | 924 | 997 | 304 | 751 | 2,977 |
| Galimuyod | 104 | 264 | 11 | 1,635 | 2,013 |
| G. del Pilar | 0 | 0 | 0 | 1,762 | 1,762 |
| Lidlidda | 0 | 0 | 839 | 629 | 1,469 |
| Magsingal | 827 | 1,989 | 3 | 412 | 3,231 |
| Nagbukel | 630 | 842 | 0 | 118 | 1,589 |
| Narvacan | 403 | 3,541 | 0 | 123 | 4,068 |
| Quirino | 438 | 1,992 | 0 | 117 | 2,547 |
| Salcedo | 477 | 1,265 | 0 | 208 | 1,950 |
| San Emilio | 0 | 325 | 549 | 1,150 | 2,024 |
| San Esteban | 225 | 1,339 | 0 | 47 | 1,611 |
| San Hldelfonso | 425 | 1,117 | 5 | 5 | 1,553 |
| San Juan | 619 | 2,127 | 0 | 144 | 2,890 |
| San Vicente | 12 | 1,476 | 0 | 267 | 1,755 |
| Santa | 256 | 2,026 | 0 | 24 | 2,306 |
| Santa Catalina | 272 | 1,313 | 0 | 281 | 1,866 |
| Santa Cruz | 963 | 2,077 | 93 | 630 | 3,762 |
| Santa Lucia | 205 | 1,662 | 106 | 938 | 2,910 |
| Santa Maria | 934 | 2,172 | 0 | 8 | 3,114 |
| Santiago | 528 | 1,354 | 121 | 493 | 2,496 |
| Santo Domingo | 837 | 2,122 | 0 | 51 | 3,011 |
| Sigay | 0 | 0 | 0 | 1,658 | 1,658 |
| Sinait | 0 | 2,904 | 161 | 207 | 3,272 |
| Sugpon | 0 | 1,599 | 141 | 266 | 2,006 |
| Suyo | 657 | 1,021 | 10 | 428 | 2,116 |
| Tagudin | 59 | 2,559 | 23 | 912 | 3,552 |
| Vigan (Capital) | 3,946 | 0 | 90 | 0 | 4,036 |
| 3. Total | 32,287 | 76,443 | 3,503 | 19,135 | 131,368 |

Calculation process is further described as follows:

(1) Projection of annual IRA to all LGUs in the Philippines from 1996 to 2000

The IRAs come from 40% of past and /or projected national internal revenue taxes from 1993 to 1997 (3rd fiscal year preceding the current year). This ratio is based on the Local Government Code in 1991.

(2) Distribution of national total IRA to each administrative unit

Based on the Local Government Code, IRA is distributed by administrative level as follows:

| | |
|----------------|-----|
| Provinces | 23% |
| Cities | 23% |
| Municipalities | 34% |
| Barangays | 20% |

(3) Distribution of national total IRA to the subject province by provincial, municipal and barangay level

With reference to allocation of national IRA by administrative level, provinces and municipalities are based on weighted 3 factors; population, land area and number of administrative units. In this analysis, however, the distribution percentage experienced in 1994 is simply employed (refer to Table 6.2.2, Main Report and Supporting Report). Allotments to barangays are added to the IRAs for municipalities (80,000 peso times number of barangays).

(4) Projection of available IRA to the relevant sector by administrative unit of the province

According to the Provincial Annual Report in 1994, about 1.7% of provincial IRA was availed for the water supply and sanitation sector. Referring to the experiences in other province, provincial allocation to the relevant sector is assumed to be 4%. This means that 20% of "20% Development Fund" from national IRA are counted on sector projects. The same percentage is applied for the allocation of municipal IRA to the sector.

(5) Available IRA of municipalities by sub-sector

Available municipal fund for the four components (urban and rural water supply, and urban and rural sanitation) is estimated as a sum of respective components in combination of those allocated from the province and distributed in each municipality. Distribution of sector total fund to sub-components both in provincial and in municipal levels is arranged in proportion to the direct construction cost required for Phase I Development.

With regard to the distribution of provincial IRA for urban water supply to respective municipalities, weighing method with ranking is employed, which will be discussed in detail in Section 11.4. For other components, provincial IRA is distributed to municipalities in proportion to their required costs in Phase I.

11.3 Additional Funding Requirements

Annual cost required for the whole province during the medium-term development is summarized in Table 11.3.1 referring to the study results in Chapter 10. The total cost required covers physical contingency; 15% of the direct cost and price contingency; 10% per year covering the direct cost and physical contingency. Details of implementation arrangements for annual investment are shown in Table 11.3.1, Supporting Report.

Table 11.3.1 Financing Requirements by Sector Component for the Province

Unit: 1,000 Pesos

| Sector Components | 1996 | 1997 | 1998 | 1999 | 2000 | Total 1996-2000 | Total 2001-2010 |
|---|---------------|---------------|----------------|----------------|----------------|--------------------|--------------------|
| Direct Cost | | | | | | | |
| 1. Direct Construction Cost | | | | | | | |
| Urban Water Supply | | | | | | | |
| Level III System | 0 | 13,533 | 20,300 | 20,300 | 13,533 | 67,667 | 356,668 |
| Rural Water Supply | | | | | | | |
| Level II System | 1,840 | 1,840 | 0 | 0 | 0 | 3,680 | 0 |
| Level I Facilities | 16,461 | 30,179 | 30,179 | 30,179 | 30,179 | 137,178 | 165,762 |
| Urban Sanitation | | | | | | | |
| Household toilet | 59 | 108 | 108 | 108 | 108 | 491 | 292 |
| Public school toilet | 223 | 409 | 409 | 409 | 409 | 1,859 | 2,477 |
| Public toilet | 190 | 349 | 349 | 349 | 349 | 1,586 | 9,201 |
| Disinfection of Level I Deep & Shallow Wells | 6 | 14 | 14 | 14 | 14 | 62 | 0 |
| Rural Sanitation | | | | | | | |
| Household toilet | 603 | 1,105 | 1,105 | 1,105 | 1,105 | 5,021 | 22,833 |
| Public school toilet | 2,239 | 4,104 | 4,104 | 4,104 | 4,104 | 18,655 | 22,376 |
| Disinfection of Level I Deep & Shallow Wells | 51 | 94 | 94 | 94 | 94 | 427 | 507 |
| Urban Sewerage | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 560,635 |
| Sub-total | 21,672 | 51,734 | 56,661 | 56,661 | 49,895 | 236,626 | 1,140,751 |
| 2. Sector Management Cost | | | | | | | |
| Engineering Studies | | | | | | | |
| Feasibility Study and Detail Design | 8,897 | 5,514 | 2,469 | 2,469 | 1,235 | 20,584 | 99,957 |
| Construction supervision | 846 | 2,030 | 2,228 | 2,228 | 1,957 | 9,288 | 45,131 |
| Community Development and Training | | | | | | | |
| Institutional development & logistic support | 5,076 | 4,873 | 4,653 | 4,653 | 2,519 | 21,774 | 103,293 |
| Sub-total | 14,819 | 12,418 | 9,349 | 9,349 | 5,711 | 51,646 | 248,381 |
| Total Direct Cost | 36,491 | 64,152 | 66,010 | 66,010 | 55,606 | 288,272 | 1,389,132 |
| Contingencies | | | | | | | |
| 1. Physical Contingency (15% of Direct Cost) | 5,474 | 9,623 | 9,902 | 9,902 | 8,341 | 43,241 | 208,370 |
| 2. Price Contingency (10%/annum of Direct Cost & Physical Contingency) | 4,196 | 15,493 | 25,127 | 35,231 | 39,040 | 119,087 | N.A. |
| Total Investment Cost | 46,161 | 89,268 | 101,039 | 111,142 | 102,987 | 450,600 | 1,597,501 |

Table 11.3.2 presents additional funding requirements of the province (or shortfall in funding), which are figured out comparing with available fund for the relevant sector (IRA) in the province over the Phase I requirements. Other funds such as those provided by foreign assistance and local tax portion are kept blank to supplement upon confirmation of additional fund available. A big short fall of funding is identified since the IRA accounts for only 29.2% of the total cost requirements in Phase I.

Table 11.3.2 Additional Fund Requirements for the Medium-Term Plan

Unit: 1,000 Pesos

| | 1996 | 1997 | 1998 | 1999 | 2000 | Total 1996-2000 |
|--|--------|--------|---------|---------|---------|-----------------|
| Financing Requirements | 46,161 | 89,268 | 101,039 | 111,142 | 102,987 | 450,600 |
| Expected available fund | | | | | | |
| National | 0 | 0 | 0 | 0 | 0 | 0 |
| Local (IRA) | 17,895 | 22,560 | 25,955 | 30,723 | 34,235 | 131,368 |
| Others | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 17,895 | 22,560 | 25,955 | 30,723 | 34,235 | 131,368 |
| Shortfall in funding (Additional Fund Requirements) | 28,266 | 66,708 | 75,084 | 80,419 | 68,752 | 319,232 |

Municipal achievement percentages in finance are shown in Table 11.3.3 in provision of available fund originated by IRA against Phase I financial requirements. The percentages of Banayoyo, Cabugao, Galimuyod, G. del Pilar, Lidlidda, Sigay and Sugpon are more than 100% based on the assumptions discussed before. Thus, for these municipalities, the distribution share of IRA to relevant sector, which is set at 4%, may be modified. The percentage of San Emilio (80%), Nagbukel (72%) and San Ildelfonso (63%) are more than double comparing to the provincial average of 29.2%. Others are in the range between 12 and 53% to the requirements.

11.4 Medium-Term Implementation Arrangements

Financial requirements to meet Phase I target coverage are substantial. However, projected fund available (IRA) in application of past trend revealed that considerable amount of additional fund must be arranged.

Under this situation, reference scenarios are discussed in assumption of different levels of funding availability with reference to service coverage. Alternative countermeasures are also

Table 11.3.3 Internal Revenue Allotment for Water Supply and Sanitation Sector by Municipality (Medium-Term Development/1996-2000)

Unit: 1,000 Pesos

| Municipalities | IRA Allocation to Municipalities | | | | | | | | | | Total Cost Required for Municipality (b) | Achievement Percentage (%) in Finance (a)/(b) | | | |
|-----------------|--|----------------------------|--------|-------------------------------------|----------------------------|--------|-------------------------------------|----------------------------|-------|-------------------------------------|--|---|----------------------------|---------|-------|
| | Urban Water Supply | | | Rural Water Supply | | | Urban Sanitation | | | Rural Sanitation | | | | | |
| | Allotted from Provincial Government ² | Allotted from Municipality | Total | Allotted from Provincial Government | Allotted from Municipality | Total | Allotted from Provincial Government | Allotted from Municipality | Total | Allotted from Provincial Government | | | Allotted from Municipality | Total | |
| Allern | 1,137 | 656 | 1,792 | 562 | 1,382 | 1,944 | 7 | 14 | 20 | 110 | 3,896 | 8,997 | 43.0 | | |
| Bansovo | 0 | 491 | 491 | 90 | 1,203 | 1,293 | 0 | 0 | 0 | 21 | 1,805 | 1,332 | 135.5 | | |
| Bantay | 305 | 1,778 | 2,083 | 1,216 | 1,664 | 2,880 | 0 | 0 | 0 | 85 | 5,047 | 26,480 | 19.1 | | |
| Burgos | 1,137 | 768 | 1,905 | 568 | 1,337 | 1,905 | 10 | 19 | 29 | 64 | 3,903 | 9,572 | 40.5 | | |
| Carigao | 0 | 0 | 0 | 296 | 2,945 | 3,240 | 0 | 0 | 0 | 56 | 554 | 3,851 | 3,650 | 105.5 | |
| Canidao | 1,137 | 1,222 | 2,358 | 3,014 | 2,583 | 5,596 | 172 | 122 | 294 | 794 | 675 | 9,718 | 55,766 | 17.4 | |
| Caoyan | 305 | 912 | 1,217 | 1,216 | 1,368 | 2,583 | 16 | 15 | 31 | 57 | 63 | 3,951 | 21,767 | 18.2 | |
| Cervantes | 305 | 924 | 1,229 | 382 | 997 | 1,379 | 142 | 304 | 446 | 291 | 751 | 4,096 | 11,854 | 34.6 | |
| Galmudog | 0 | 104 | 104 | 22 | 264 | 286 | 1 | 11 | 12 | 140 | 1,653 | 2,177 | 122.5 | | |
| G. del Pilar | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 1,769 | 1,769 | 73 | 2423.2 | |
| Inditida | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 839 | 840 | 1 | 629 | 1,470 | 13 | 11308.6 | |
| Magsaysay | 305 | 827 | 1,132 | 952 | 1,989 | 2,941 | 2 | 3 | 5 | 199 | 412 | 4,688 | 16,050 | 29.2 | |
| Nayabait | 813 | 630 | 1,443 | 186 | 842 | 1,027 | 0 | 0 | 0 | 26 | 118 | 1,444 | 3,639 | 71.8 | |
| Narvacan | 1,137 | 403 | 1,540 | 3,688 | 3,541 | 7,229 | 0 | 0 | 0 | 130 | 123 | 253 | 9,022 | 20.5 | |
| Quirino | 305 | 438 | 743 | 742 | 1,992 | 2,734 | 0 | 0 | 0 | 44 | 117 | 161 | 9,854 | 36.9 | |
| Salcedo | 305 | 477 | 782 | 338 | 1,265 | 1,603 | 0 | 0 | 0 | 56 | 208 | 2,648 | 5,402 | 49.0 | |
| San Ermito | 0 | 0 | 0 | 45 | 325 | 370 | 92 | 549 | 641 | 160 | 1,150 | 1,310 | 2,320 | 80.0 | |
| San Esteban | 305 | 225 | 530 | 450 | 1,339 | 1,769 | 0 | 0 | 0 | 16 | 47 | 62 | 2,382 | 42.4 | |
| San Ildefonso | 305 | 425 | 730 | 230 | 1,117 | 1,347 | 1 | 5 | 7 | 1 | 5 | 2,090 | 3,318 | 63.1 | |
| San Juan | 305 | 619 | 924 | 821 | 2,127 | 2,948 | 0 | 0 | 0 | 56 | 144 | 200 | 4,072 | 11,589 | 35.1 |
| San Vicente | 64 | 12 | 76 | 920 | 1,476 | 2,396 | 0 | 0 | 0 | 168 | 267 | 435 | 2,907 | 11,360 | 23.6 |
| Santa Catalina | 305 | 256 | 561 | 1,048 | 2,026 | 3,074 | 0 | 0 | 0 | 12 | 24 | 36 | 3,672 | 12,394 | 29.6 |
| Santa Cruz | 1,137 | 272 | 1,409 | 624 | 1,313 | 1,937 | 0 | 0 | 0 | 135 | 281 | 416 | 2,929 | 9,213 | 31.8 |
| Santa Lucia | 305 | 963 | 2,099 | 1,484 | 2,077 | 3,562 | 80 | 93 | 173 | 454 | 630 | 1,083 | 6,918 | 27,923 | 24.8 |
| Santa Lucia | 305 | 205 | 510 | 1,170 | 1,662 | 2,831 | 90 | 106 | 196 | 665 | 938 | 1,603 | 5,141 | 21,273 | 24.2 |
| Santa Maria | 1,137 | 924 | 2,071 | 2,272 | 2,172 | 4,443 | 0 | 0 | 0 | 8 | 8 | 16 | 6,530 | 33,831 | 19.3 |
| Santiago | 305 | 528 | 833 | 652 | 1,354 | 2,006 | 71 | 121 | 192 | 240 | 493 | 733 | 3,763 | 12,489 | 30.1 |
| Santo Domingo | 305 | 837 | 1,142 | 493 | 2,122 | 2,615 | 0 | 0 | 0 | 12 | 51 | 63 | 3,821 | 7,263 | 52.6 |
| Sinigay | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 1,658 | 1,665 | 76 | 2190.8 | |
| Sinait | 0 | 0 | 0 | 1,051 | 2,904 | 3,955 | 71 | 161 | 232 | 76 | 207 | 293 | 4,469 | 12,300 | 36.3 |
| Sugboon | 0 | 0 | 0 | 112 | 1,599 | 1,711 | 12 | 141 | 153 | 19 | 266 | 285 | 2,150 | 1,466 | 146.6 |
| Suro | 305 | 657 | 962 | 382 | 1,021 | 1,403 | 4 | 10 | 14 | 162 | 428 | 590 | 2,970 | 8,232 | 36.1 |
| Tagudin | 145 | 59 | 204 | 855 | 2,559 | 3,413 | 9 | 32 | 307 | 912 | 1,219 | 4,868 | 12,319 | 39.5 | |
| Vigan (Capital) | 305 | 3,946 | 4,251 | 0 | 0 | 0 | 96 | 90 | 186 | 0 | 0 | 4,437 | 36,804 | 12.1 | |
| Total | 12,721 | 19,367 | 32,257 | 25,880 | 50,563 | 76,443 | 877 | 2,625 | 3,503 | 4,386 | 14,748 | 19,135 | 131,368 | 29.2 | |

Notes:
 (1) Potential funds through foreign donors and others are not included.
 (2) Provincial IRA of urban water supply to municipalities is distributed according to the ranking arrangement. Others are distributed in proportion to their required costs.

discussed in view of (1) acquisition of external funds, (2) augmentation of sector finance under current arrangements (IRA and others), (3) introduction of private sector to mitigate public investment needs, and (4) effective and economical investments.

11.4.1 Reference Scenarios in Different Funding Levels

Achievement levels of service coverage in the target year are examined in assumption of five funding levels. It is regarded that the service coverage is increased in proportion to the investment during Phase I period. The relationships between funding levels and corresponding percentages of service coverage are illustrated in Figure 11.4.1 and Figure 11.4.2 for water supply and sanitation sectors, respectively. It is common to all sub-sectors except rural water supply that the service coverage in 2000 would not sustain even the present levels in the provision of only projected IRA.

Three reference scenarios are discussed on different levels of funding. These scenarios will be referred to in combination of alternative countermeasures discussed in Section 11.4.2. Using computer-based programs, these scenarios may be modified by policy makers according to the updated information and policy on available fund and sector targets.

(1) The First Reference Scenario

No funding constraints is considered in this scenario to realize Phase I development as planned. This scenario is too optimistic based on the past experiences.

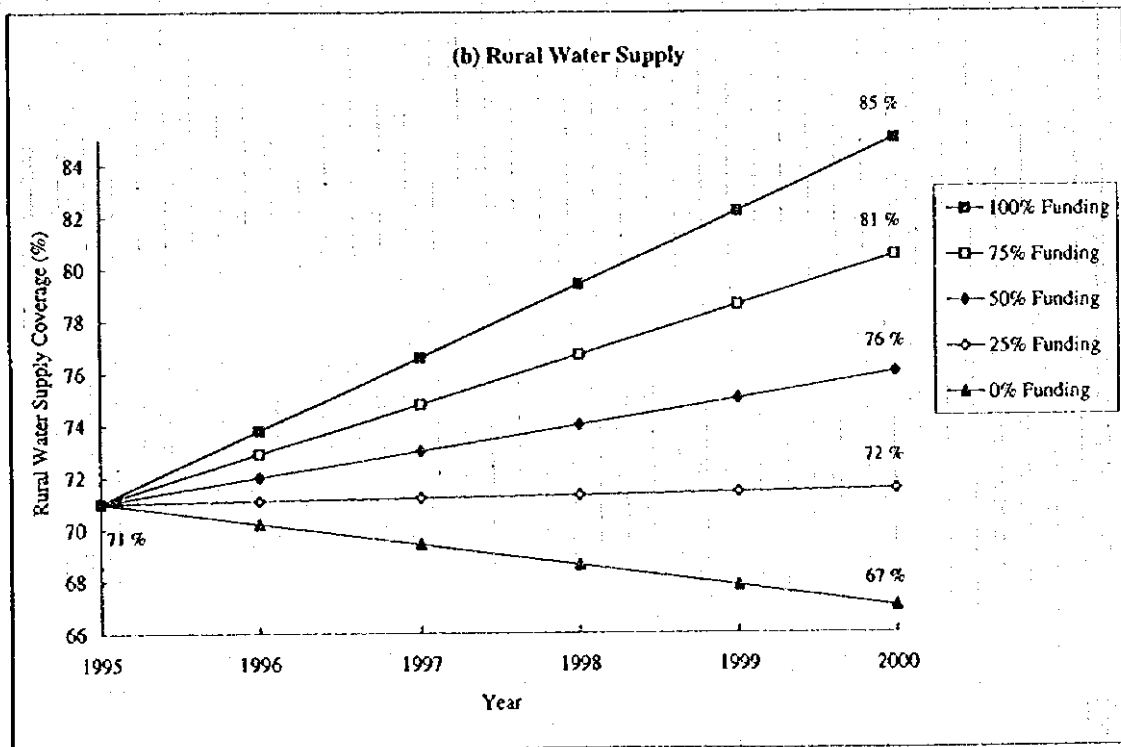
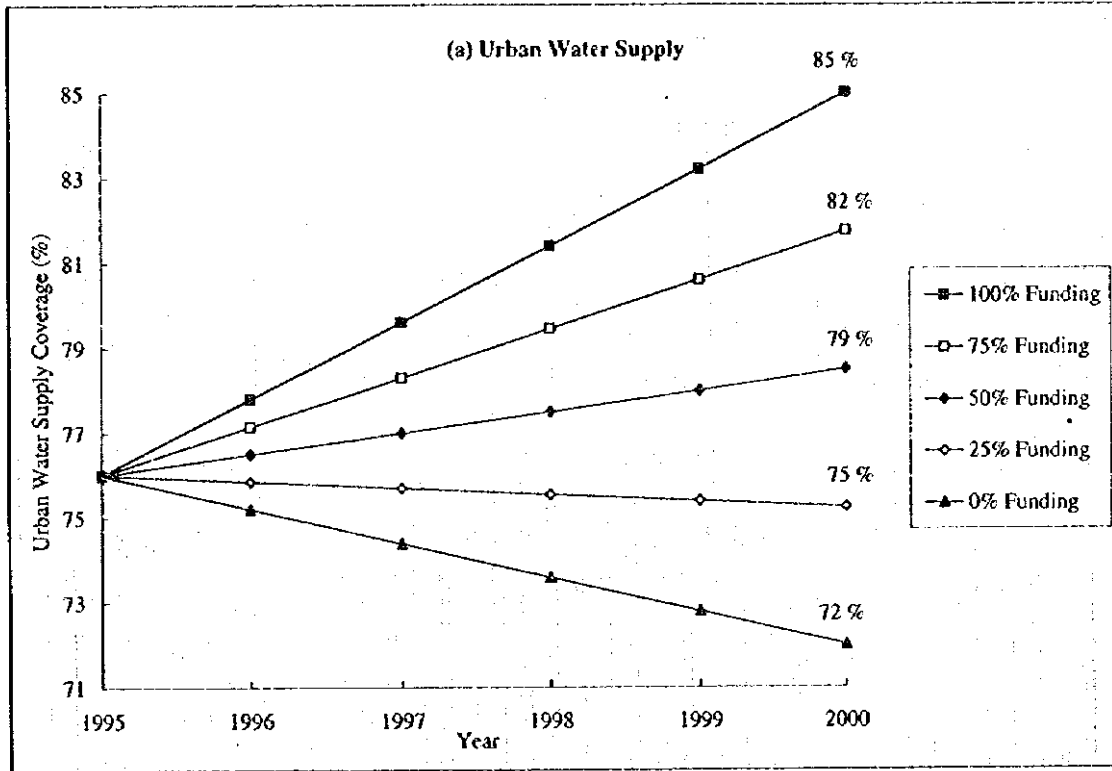
(2) The Second Reference Scenario

An intermediate scenario with 75 % funding is considered. Urban and rural water supply coverage in the year 2000 are attained at 82% and 81%, respectively. For urban and rural sanitation (household toilets), coverage will reach to 93% and 92%, respectively on the assumption that required private investments are followed.

(3) The Third Reference Scenario

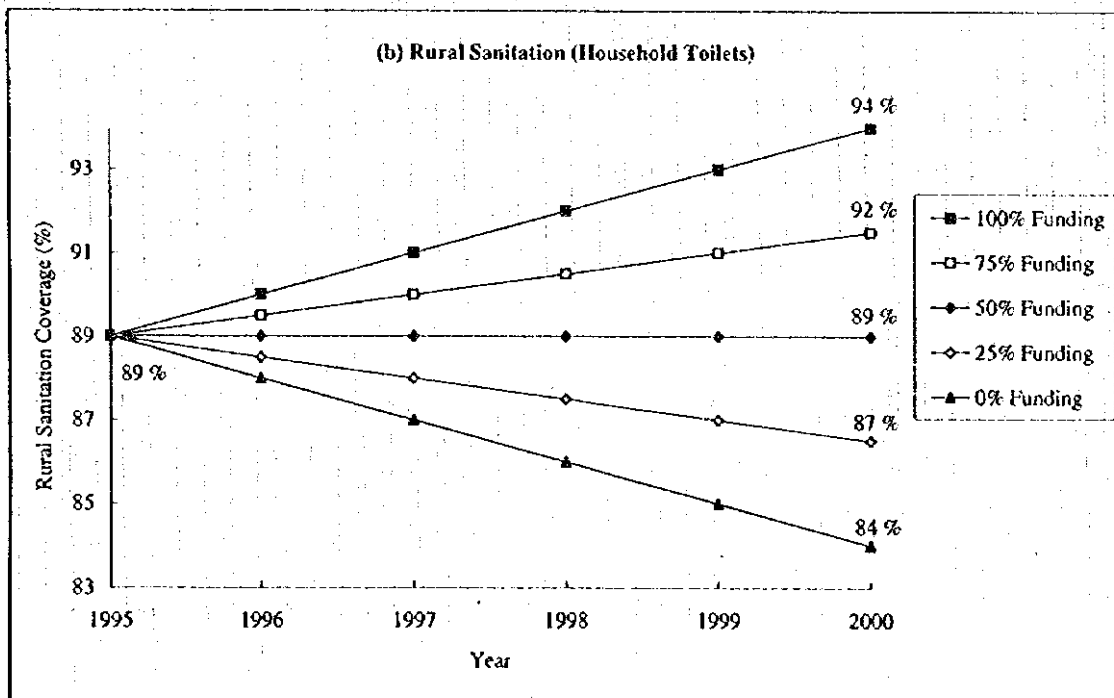
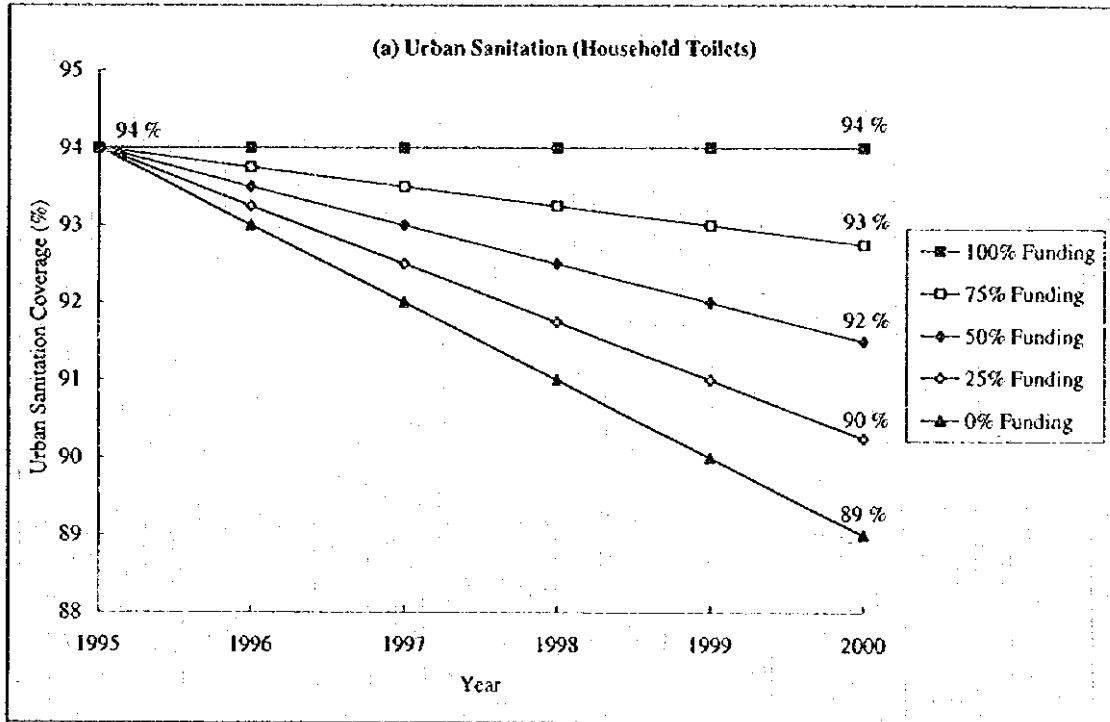
A 50% funding against the total requirements of Phase I is assumed as a possible achievement level with the IRA. Urban and rural water supply coverage in the year 2000

Figure 11.4.1 Relationship between Funding Levels and Percent of Coverage for Water Supply Sector



Note: Percentages of the coverage between 1995 and 2000 are simply prorated as the reference.

Figure 11.4.2 Relationship between Funding Levels and Percent of Coverage for Sanitation Sector



Note: Percentages of the coverage between 1995 and 2000 are simply prorated as the reference

will be attained at 79% and 76%, respectively, while urban and rural sanitation coverage will be at 92% and 89%.

11.4.2 Alternative Countermeasures

(1) Acquisition of external funds

Foreign assistance has played a significant role for the development of the relevant sectors in the past. Negotiations with the central government agencies (DILG, LWUA, etc.) are requisites to access the foreign funds. Development of new local financial mechanism is also needed for LGUs under current policy shifts, to increase the opportunities of LGUs undertaking foreign-assisted projects

As a matter of fact, Local Government Empowerment Fund (LGEF) will be established in 1996 to provide a mechanism for channeling external grants and loans to 19 priority provinces under the Social Reform Agenda and/or those classified as 5th or 6th class LGUs (details are referred to Chapter 11.4.2, Supporting Report). Since Ilocos Sur is not included in the priority provinces, the province may not be supported by this fund.

LWUA Medium-Plan includes Santa Maria and Santo Domingo municipalities as among the 200 project sites (ADB funded projects ; 88 million Pesos in 1997 and 243 million Pesos in 1998).

(2) Augmentation of sector finance under current arrangements

Increase of the IRA to the Relevant Sector

The increase of IRA from the national government to LGUs is at first needed along with current procedure. LGUs shall also arrange the funds with a priority to the relevant sector.

Local Taxes

More allocation of local taxes to the relevant sector shall be arranged although the share of local taxes in the provincial total budget is small.

Utilization of Allotted Fund from Tobacco Excise Tax under RA7171

Allocation from tobacco excise taxes under RA7171 to the relevant sector should be taken into consideration although the sector's development is not the major objective of this allotment (details of this allocation under RA7171 is referred to Chapter 11.4.2, Supporting Report).

Utilization of Other Local Funds

Utilization of other funds, Countryside Development Fund (CDF) in particular, shall be sought for development of the relevant sector.

(3) Introduction of private sector

Privatization of Water District or Level III System

Privatization of water districts/Level III systems helps expedite sector development and sustainability of the system as suggested by NEDA Board Resolution No. 4 (s. 1994).

LGU Guaranty Organization

LGU Guaranty Organization as a public-private corporation managed by private sector in the national level shall be studied to encourage private financing for the development of environmental infrastructure, which is introduced in other developing countries. The organization will guarantee local private loans to LGUs in provision of a longer term financing.

(4) Effective and economical investment

Investment Need Ranking of Municipalities

Investment need ranking of the municipalities is discussed as a guide for implementation of PW4SP and a measure for effective and economical public investment. Referring to this ranking, the provincial government will arrange its financial resources more effectively.

The ranking for urban water supply is specifically studied considering three factors, while a sole factor of additional requirements is assumed to coincide with the priority of other sub-sectors. Synthetic evaluation of concerned sub-sectors is finally presented in the context of comprehensive improvement of this sector. The result for urban water supply is employed for allocation of provincial IRA to the municipalities in the