

Maldives - 4 Years after the tsunami

Progress and remaining gaps



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Executive Summary

In the four years since the tsunami, much has been accomplished to provide its survivors first with basic needs and then with the resources to restart their lives. Most of the physical infrastructure will be finished in 2009 and tsunami resources have enabled notable improvements in health and education. The challenging housing sector was brought under control and most of the remaining work will be completed in the year as well. Large-scale disruptions to livelihoods and the economy were mitigated. Lasting improvements made in disaster risk reduction policies, institutions and systems will increase resilience to future crises.

Although the speed and scope of recovery in the Maldives has been impressive, a number of problems caused or worsened by the tsunami have not yet been resolved and remain priorities for government and its partners: The vital needs of water and sanitation and reconstruction of remaining infrastructure for harbours and jetties remain unfinished priorities highlighted in the analysis. Additionally, the relocation of entire island populations is clearly a complex undertaking. Completing the last of the housing and resettling remaining displaced persons (IDPs) will require attention to such details as livelihoods and social arrangements on the islands. It is inevitable that some of these processes will lag into 2010 while currently unfunded sanitation and harbour infrastructure projects will need to extend even further into the future.

Lastly, the analysis highlights standing development challenges that are chronic or otherwise mostly unrelated to the tsunami, particularly, youth employment and child malnutrition.

The many successes already achieved show that it has been possible to 'build back better'. However, in other sectors, resources have been exhausted while unfinished work remains. It now falls on government and its partners in the tsunami recovery to take stock of remaining unfinished gaps in the recovery operation. The time between now and the 5th year anniversary in December 2009 presents a window of opportunity to complete this remaining work, before the attention of the world focuses anew on how effective tsunami recovery programmes actually were.

Vital needs

Water

Maldives has very limited usable groundwater resources and is primarily dependent on collected rainwater. Seasonal water shortages are chronic. Water availability was made worse by the tsunami through pollution of meagre groundwater resources and extensive damage to rainwater harvesting and storage systems. Tsunami recovery enabled provision of water tanks and other rainwater harvesting supplies, as well as installation of desalination facilities.

However, progress in installing rainwater harvesting systems, tanks and piping for a planned 41,000 houses, on 195 islands, is only 73% complete, with 4,524 tanks that have not yet been distributed and another 6,666 that have not been installed. This increases demand for emergency provision of water from the limited and costly desalination facilities, averaging Rf. 860,425 per year over the last four years.

Expeditious completion of water tank installation is therefore a priority in order to meet basic needs of the population and avoid use of scarce budgetary resources to finance emergency water supplies. However, since stored rainwater is insufficient to meet all dry season water needs, additional measures are also needed, including more widespread operation of desalination equipment along with sanitation improvements to enable use of groundwater.

Currently, 35 islands including Male' have access to water from functioning reverse osmosis (RO) desalination installations. Most of the units are small, with capacity reaching a minimum standard of 5 litres per person per day on only 26 islands.

Sanitation

The years before the tsunami saw the proportion of households without safe sanitation fall from 46% in 1997 to 12% in 2004. However, flooding during the tsunami contributed to problems of broken and overflowing septic tanks contaminating groundwater. Tsunami housing projects brought with them improvements in septic tank technology, but other necessary community sanitation projects on 68 islands are only 9%

complete. Completion of these projects is an essential component to restoring sustainable water management post-tsunami.

Internally displaced persons (IDPs)

Immediately after the tsunami, nearly 30,000 persons (about one in six of the atoll population) were moved from their islands. Two weeks later, more than half had returned to their islands. For the remaining IDPs more time was needed to provide new housing and by the end of 2008 about 3,700 persons were still waiting for their new houses. This included most of the population of M. Kolhudufushi, Th. Vilufushi and the islands of Villingili, Maamendhoo, Nilandhoo and Dhaandhoo in Ghaafu Alifu atoll.

In March, 2009 the R. Kadholhudhoo population moved to the new island of R. Dhuvaafaru while the population of Th. Vilufushi also returned to their newly reconstructed island in May 2009. Work on some other islands was delayed and will see completion by the end of 2009 or into 2010. Government and partners need to focus on completion of remaining housing projects as outlined below, as well as to resolve any remaining obstacles if all remaining IDPs are to be settled as soon as possible. Moreover, newly re-settled populations will need support to ensure their successful re-integration after such a long period living in shelters on different islands, often under difficult circumstances.

Housing

More than 8,500 houses were damaged or destroyed during the tsunami and needed major repairs or replacement. A year later, only 10% of repairs and reconstructions were completed, but by end 2008, nearly 85% had been finished. Reasons for slower than expected progress included the need to reconstruct several islands before construction could start; lengthy planning and community consultation; community decision-making capacities; construction material delivery issues and the need to bring in outside labour; changes in design of the standard house; and sharp increases in construction costs.

While housing repairs are now all but complete, reconstruction of 2,811 houses is only 55% complete and more than 340 houses have not yet started.

Attention must surely focus on these remaining projects, especially the 4 islands in Gaafu Alifu atoll, HD. Nolvharanfaru, problematic M. Kolhufushi and added units in Th. Madifushi and L Maabaidhoo. Timing of the completion of these projects will likely impede the resettlement of remaining IDPs as promised by end-2009. Secondly, ancillary projects, including roads and other infrastructure as well as attention to livelihoods, will require completion in the larger schemes (e.g. R. Dhuvaafaru) to help the new communities function. Lastly, unavoidable "mission creep" caused by missed needs and expanding beneficiary expectations will expand the number of housing units needed, even in completed locations, and will need to be separately managed to keep it from continuing indefinitely.

Survival and Health

The impact of the tsunami on the various health indicators was negligible and long-term improving trends continued, with at worst only minor blips in 2005. Immunisation rates have been close to 100% of the eligible children for the past decade, and these did not show major decreases since the tsunami. The infant mortality rate and maternal mortality ratio are at par with countries like Malaysia and Jordan, and only a quarter of those of India and Pakistan, and thus put the Maldives amongst the middle income countries. However, malnutrition is known to be a longstanding problem with 31% of children under-five measured as underweight in 2004. However, dietary habits rather than poverty are the major cause of malnutrition in the Maldives.

Basic services

Though health and education facilities were damaged or destroyed on many islands, emergency repairs and temporary arrangements ensured access to these services for all islanders within a few months, and for most within a few weeks, of the tsunami. As a result, MDG and other indicators measuring longer trends were barely influenced.

School attendance and immunisation rates, for instance, did not change significantly after the tsunami, in part because many of the most affected moved to shelters in communities where services had not been significantly affected. Although the facilities were stressed, they were quickly scaled up as the teachers and medical staff from the affected islands had moved to their temporary locations along with the rest of the population and therefore could continue to work.

Infrastructure

Schools and other educational infrastructure totalling about US\$ 15.5m were destroyed by the tsunami. Reconstruction picked up slowly, with only about 10% completed in the first year. By the end of 2008 more than 85% of projects were implemented and the main outstanding activities are those on the reconstructed islands.

Similarly, health facilities and equipment have largely been restored and most are already operational. Health facilities on 40 islands, ranging from small health posts to regional hospitals were rebuilt. At the end of 2008 only the regional hospital in L. Gan was still under construction. In both health and education, new facilities are greatly superior to what they replace.

Electrical systems have also been restored, and often improved, in all islands where they had been damaged.

As mentioned, water and sanitation infrastructure remains far from completed. Improved septic tanks are integral to the new housing projects. However, of the sanitation projects on 68 islands, 9% are now complete, with another 28% expected to be completed in 2009 and 2010. This will improve groundwater on 25 islands for over 40,000 people. Importantly, the remaining 63% of planned projects have either no remaining funding or serious funding gaps.

Records show 55 small-scale water desalination units have been procured for use outside Male'. Of these, 35 are operational, 14 need installation and 6 need repair. These remaining units should be put to use and the distribution of units rationalized to best address emergency dry season water requirements and reduce the annual need for emergency provision of water.

Another priority gap area is the rehabilitation of harbours and jetties on the 104 islands where they had been damaged. Of 55 priority islands identified, records for end-2008 showed works completed on 15 islands and ongoing in another 11 islands. By April 2009, Government records reported 21 of the 55 projects completed (38%).

At this stage, lack of funding is the rate limiting factor, due to a combination of under-assessed damages, expanding beneficiary requirements and further damage caused by inattention during the intervening period. An estimated funding gap of \$37.6 m makes it both the sector with the lowest share in commitments and the highest funding gap in dollar terms.

Livelihoods

Tourism is the main driver of the economy and the immediate-term effect of the tsunami on the sector was severe. The tsunami struck during peak tourism season and the remainder of the season was largely lost.

However, by 2006 nearly all 21 damaged resorts had reopened and tourist numbers were back to pre tsunami levels. Record numbers of visitors were recorded in both 2007 and 2008. Mobility in tourism-related labour meant that people employed by these resorts were not out of work and the relatively quick recovery mitigated the harm to other jobs linked to tourism.

Interventions in the vital fisheries sector repaired and replaced boats and fishing gear, helping fishing communities capitalize on record fish catches in 2005 and 2006.

The government "safety net cash grant" programme paid 55,605 tsunami-affected individuals on average M.Rf. 900, while other grant programmes provided affected farmers and fishermen approximately M.Rf. 2,500 each.

Though not without their shortcomings, these programmes contributed to a smoother recovery of livelihoods than what might have been expected. Analysis of incomes six months after the tsunami, showed that overall, incomes had grown by 7% per capita from the year before. Mean incomes did decline somewhat for inhabitants of Malé and for inhabitants of the four evacuated islands, but further analysis shows these losses were concentrated amongst the richest half of the population, limiting the effect on poverty.

The pre-tsunami trend in poverty reduction does not seem to have been interrupted by the tsunami. In 1997, 48% of atoll inhabitants had an income below Rf. 15 per day, which reduced to 34% in mid 2004 and to 20% 6 months after the tsunami.

The strong performance of Tourism and fisheries, along with the continuing boom in construction, including the reconstruction of the tsunami damage, provided ample job opportunities for those affected by the tsunami. In addition, the restoration of agricultural and fish processing facilities on the islands restored the traditional jobs of many islanders.

The current worldwide recession started to have its impact in late 2008 but with the opening of many new resorts over the coming years, some relief can be expected from new, diversified sources.

Completion of housing projects will need to ensure livelihoods can be preserved or improved. Youth unemployment has been rightly highlighted as a priority for the new administration, but has not been linked to unemployment caused by the tsunami.

Disaster preparedness

Reducing the future risk to life and property was a priority in reconstruction. Some communities were relocated to larger, safer islands, while in a few cases islands were "rebuilt." Protective barriers along the islands were improved while newly built schools and administrative offices have generally been constructed as multi-storied buildings, providing previously unavailable safe areas in cases of tidal surges and flooding.

Equally important is the awareness created both in the general population and the administration that disaster preparedness plays an important role in the mitigation of the worst effects of inevitable natural disasters. Improved communication facilities provide the physical infrastructure for the new disaster management system being developed. Regional and worldwide early warning systems of tsunami and storm risks are being developed and those will provide additional inputs for the local administration. At the local level, the planned establishment of the Maldivian Red Crescent Society can provide the necessary infrastructure and volunteer manpower to assist in disaster preparedness and in future disaster relief efforts.

Toward continued evidence based decision-making

Evidence-based management of the tsunami recovery—and development plans in general-- entails regular collection of summary data, systematically provided to a government authority that can review across sectors. To date the compilation of a limited set of multisectoral data has proved a challenge and improved arrangements are still necessary to make the sharing of specific data faster and more regular.

Additionally, proof of the outcomes of the recovery effort generally requires surveys, and there has been an absence of survey activity since 2005/6. In Maldives, modern communication technology makes possible low cost alternatives to logistically complex and expensive household surveys.

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Note:

In the Maldives it is common practice to have island names are preceded by the first letter (in Dhivehi) of the local name of the atoll, as island names are not unique across the Maldives. For instance, inhabited islands named Madifushi are present in both Dhaalu and Meemu atolls. In order to distinguish them, they are labelled as Dh. Madifushi and M. Madifushi respectively.

1. Introduction

This report gives a description of the current status as well as the development over time in some key indicators of the tsunami recovery process. The information for most of these indicators has been collected from all affected areas on a regular basis, but with decreasing frequencies over time as more and more components of the recovery process neared completion.

Under the auspices of the International Federation of Red Cross and Red Crescent Societies (IFRC) and the World Health Organisation (WHO) a system was developed for recording the recovery process in the four most tsunami-affected countries. Known as TRIAMS (Tsunami Recovery Impact Assessment and Monitoring System), its implementation in the Maldives has supported the recovery effort in a variety of ways.

TRIAMS groups all indicators under four categories: (a) vital needs; (b) basic services; (c) infrastructure and (d) livelihoods. Under each category, there are indicators for *outputs* of recovery interventions, as well as indicators of the *outcomes* on affected populations. This report broadly follows the TRIAMS framework, which is summarised in Appendix A.

The sources of the information are many, with the main sources of data being the monthly progress reports of the National Disaster Management Centre (NDMC); the annual Statistical Yearbooks and the management information systems of the Ministries of Health and Education. Most information from NDMC is on a monthly basis, while that of the other sources mentioned is annual.

These sources do not, however, cover all indicators, as for some, extensive surveys are the only source. Such surveys are not conducted on a regular, frequent basis and while pre-tsunami data is available for all, post-tsunami information is not always present.

The NDMC monthly data are always specific to the tsunami-affected islands and population. Some of the other information, such as the Tsunami Impact Assessment Survey (TIAS) also gives tabulations for the various categories of affected islanders, but other data is generally of a broader nature and covers either the total atoll population or all of the Maldives. In general, however, this is not a serious problem. Many of the indicators show nearly complete coverage both before and following the tsunami and a further breakdown cannot change the details. This includes, for instance, primary school attendance rate, immunisation rates. In other instances, the absolute number of occurrences is so low that breakdown is not possible. This applies for instance to maternal mortality rates which are based on a handful of cases only.

The impact of the tsunami on economic characteristics in the country is detailed in the Tsunami Impact Assessment Study, a nationwide survey that was conducted six months after the event and designed to be comparable with findings from the second Vulnerability and Poverty Assessment (VPA-2) that was conducted a year earlier.

In summary, the use of the data from mixed sources is not considered to negatively affect the conclusions drawn or the description of the tsunami impact in the Maldives. In any case, for each indicator presented the pre- and post-tsunami data always refer to the same basis, be it the nation, the atoll or a specific group of islands.

2. The Tsunami Recovery – Vital Needs

Output indicators

The following output indicators for Vital Needs are available for Maldives:

- a) Percentage of population with access to water from an improved source
- b) Percentage of population without basic sanitation facilities
- c) IDP Status
- d) Housing Repair
- e) Housing Reconstruction
- f) Measles immunisation coverage
- g) Contraceptive prevalence rate

For the indicators c to e, monthly data were mostly available while annual data are available for indicator f. For the other indicators, information is available only from a few large-scale surveys. Some of the information is available for mid-2005 from the Tsunami Impact Assessment Study but updates will not be available until the results of new surveys to be conducted during 2009 have been processed.

a) Percentage of population with access to water from an improved source

Pre-tsunami, considering untreated rainwater as safe, 100% of the Male' population and 97% of the atoll population had access to safe water in mid-2004.

The tsunami contaminated groundwater and damaged rainwater harvesting equipment. Following the tsunami, with the introduction of RO plants for the displaced persons as well as on islands that had suffered extensive damage to their infrastructure, some of the rainwater was replaced by RO water but otherwise no significant changes have occurred as under the given classification nearly the entire population of the Maldives had access to safe drinking water. As bottled water was one of the first commodities shipped to the various islands after the tsunami, and RO plants were shipped in quickly afterwards, the situation remained largely unchanged throughout.

While the classification of untreated rainwater may be debatable, the main problem in the Maldives is the availability of drinking water of any quality. One of the main impacts of the tsunami recovery efforts is a vast extension of the rainwater harvesting systems throughout the islands. This is elaborated under the infrastructure section of the report. Even with this expanded capacity and the wider availability of desalination plants, water shortages remain a major problem. Due to groundwater contamination—mainly by ruptured septic tanks—rainwater is now used for non-potable uses as well, and the 2,500 litre tanks are inadequate for the dry season.

b) Percentage of population without basic sanitation facilities

Over time, there have been major improvements to sanitation in the atolls. Between 1997 and 2004, the proportion of households without toilet facilities in the house or compound fell from 22 to 6% of the total atoll population. However, in 2004 for around 6% of the islanders the toilet remained a traditional 'gifili', an open space surrounded by four walls; in 1997 24% of the islanders relied on the gifili. Thus, in effect about 12% of the atoll population did not have improved sanitary facilities in 2004, as against 46% in 1997. This shows a major improvement over those seven years.

However, in the Maldives context, even categorically safe sanitation technologies may require improvement. The shallow water table is easily contaminated by unmaintained or broken septic tanks and plans to upgrade sanitation facilities are currently incomplete. As all newly constructed houses, as well as some of the repaired units will have a septic tank, the situation is bound to improve further. Even for the majority of IDPs in temporary shelters, there is a proper toilet within the 3-room family unit. Only on the islands where IDPs live in barracks (such as M. Kolhudufushi) are communal toilets used.

As part of the tsunami reconstruction programme sewerage systems, in some cases including treatment plants, are also put in place in various islands. In Male', basically all households are connected to a sewerage system.

c) Internally Displaced Persons (IDPs)

The change in the number of internally displaced persons (IDPs) is closely linked to the progress in the housing reconstruction sector, which is described below. Over time, the number of IDPs has decreased as more and more families moved to their repaired or newly built houses when these were completed. As long as part of the housing repair and reconstruction work remains pending, not all the IDPs can move to their permanent residences.

In the meantime, the living conditions of the IDPs using temporary quarters have been improved. Initially, tents were provided to house them but after a few months these were replaced with basic fixed shelters. In Meemu Atoll, the shelters still remain single rooms, while that is the case for about half the shelters in Laamu Atoll and a sixth of the units in Thaa Atoll. The other IDPs were provided with family units, generally with two or three bedrooms, a kitchen, an attached toilet (with septic tank) and an individual water tank. These new units, built to international standards, provided much needed relief for the traumatised population who lost their homes.

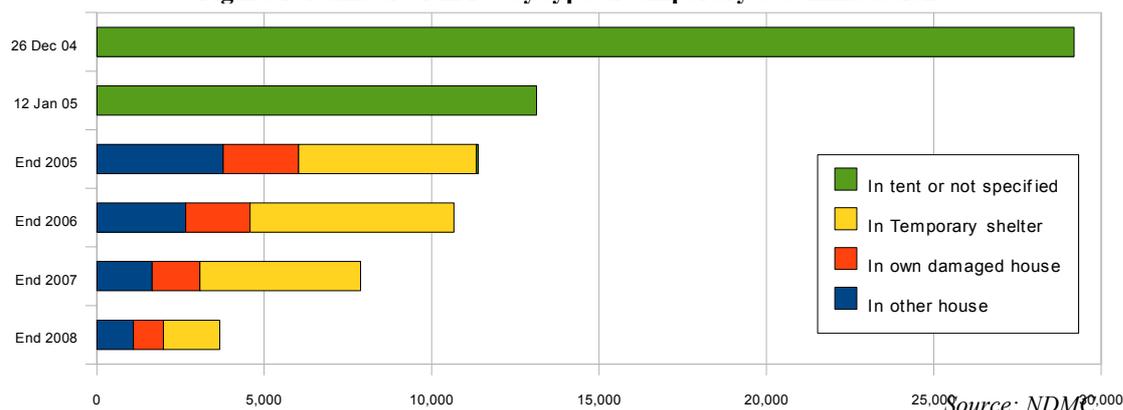
By mid January, 2005, there were about 13,000 IDPs. Nearly 60% of them came from only four islands and the provision of permanent housing to the populations of those four islands therefore has a major impact on the reduction in numbers of IDPs. The population of the island of R. Kadholhudhoo accounted for nearly one-third of all displaced people and only when their new island was created at the end of 2008 (based on the island of R. Dhuvaafaru), could they move to their new homes.

Th. Vilufushi accounted for the second-largest number of IDPs, namely about one-eighth of the total. M. Kolhufushi houses about 8% of the total in temporary shelters on its own island, while Th. Madifushi represented another 6% of the displaced persons.

In addition to the residents of R. Dhuvaafaru, those of L. Fonadhoo, L. Maabaidhoo, Th. Madifushi and L. Isdhoo-Kalaidhoo also moved into their new houses during the past year. The total number of displaced persons at the end of 2008 was therefore reduced to less than 3,700-- half living on their own islands and half on host islands. One quarter of the total was living in their own damaged houses; a similar number lived with other families and nearly half in temporary shelters. Residents of Th. Vilufushi, who have lived on Th. Buruni for the past four years, returned to their reconstructed island in May 2009.

The number of IDPs by type of temporary accommodation over the past four years shows a gradual reduction in the first years and an accelerating pace during the past two years.

Figure 1. Number of IDP's by type of temporary accommodation



Source: NDMC

Immediately after the tsunami struck, even before the full extent of the disaster was known, the Government started its relief efforts. Within days, the National Disaster Management Centre (NDMC) was established and charged with coordinating all relief efforts in the country. The NDMC also played a key role in the reconstruction efforts following the initial relief activities, but specialised units were set up in various ministries to deal with the sector-specific issues.

d) Housing repair

As a result of the tsunami, more than 8,500¹ houses were damaged or completely destroyed. Of these, 5,700 houses required repairs and 2,800 new houses needed to be constructed.

The reconstruction of houses was not always straightforward as some islands were completely devastated. It took some time to decide what the best options were and different solutions were found for different islands. The inhabitants of M. Madifushi resettled in A.Dh. Maamigili and those of Dh. Gemendhoo moved to Dh. Kudahuvadhoo. In these two cases the infrastructure was functioning on the islands the populations relocated to, and the reconstruction effort was limited to providing new houses.

At the other extreme, as a replacement for the largely destroyed island of R. Kadholhudhoo, the uninhabited island of R. Dhuvaafaru needed to be developed essentially from scratch.

The island of Th. Vilufushi was rebuilt and enlarged to 3 times its pre-tsunami size, to improve security against tidal swells.

Table 1. Three main reconstruction islands

Island	# of houses for reconstruction	Other reconstruction
R. Dhuvaafaru	600	Pre-school, Primary school, Secondary school, Auditorium, Community administration building, Water and sewage provision, Electricity network, Power station, Roads, Health centre, Sports stadium and sports ground, Waste management system, Harbour, Mosques, Retail centre, Police station, Cemetery, Telecommunications tower
T. Vilufushi	309	Sewerage system, Schools (primary and secondary), Power supply, Roads, Health centre, Desalination plant, Waste management system, Fish market, Mosques, Telecommunications tower

¹ This is the current estimate. The number of houses to be repaired and constructed has varied over time as the status has been re-assessed island by island when needed.

Island	# of houses for reconstruction	Other reconstruction
L. Gan	240	Extension of Gan regional Hospital, Schools (pre-schools and primary), Power house, Roads, Electricity network , Community centre, Sports centre, Improved sewer system, Waste management system
Others	1,662	
Total (end 2008)	2,811	

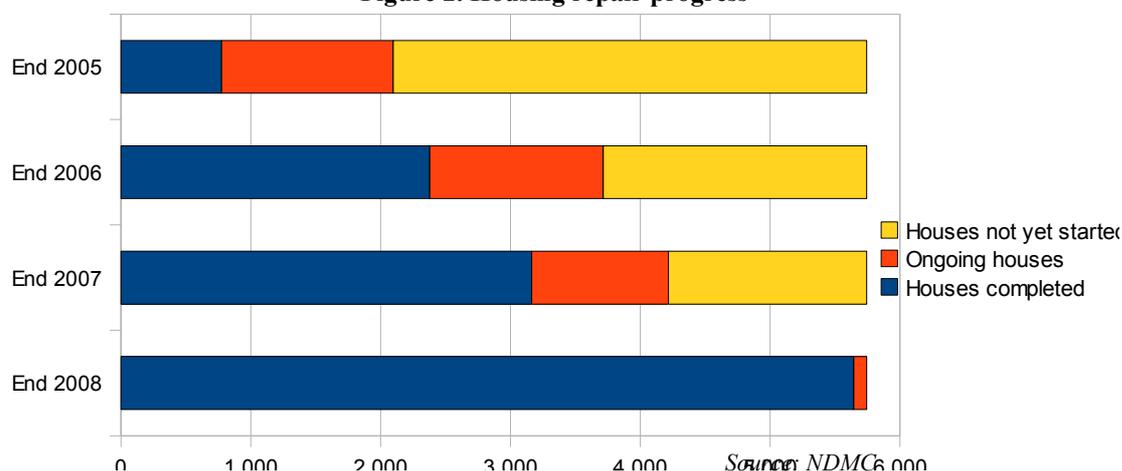
Source: NDMC, IFRC and UNDP

Along with L. Gan, these islands represent the extremes of post-tsunami reconstruction in the Maldives, extending well beyond already extensive housing needs to include the entire infrastructure of utilities and roads; mosques and community centres; education and health facilities; sports and recreation facilities; as well as commercial, industrial and agricultural/fisheries activities needed to be put in place. These required extra time for implementation (table 1).

Housing repairs were started soon after the tsunami struck and gathered pace over time. Housing repairs were required on 83 islands in 18 atolls². Organising these repair activities involved enormous logistical tasks as nearly all materials needed to be transported to the islands. This was exacerbated by the fact that the harbours or jetties in many islands were also seriously damaged by the tsunami.

Several approaches were used to assist individual households to repair their houses. The most common method was to pay instalments of the agreed total repair costs to the owners, who then organised the repairs themselves. In other cases, contractors were engaged to repair the houses. A major problem was that the price of construction materials increased very much over time and the amounts agreed on originally were not sufficient to meet the material or reconstruction costs, especially in cases where long periods lapsed between successive payments. It may be noted from the graph below that some of those periods were very long as grant amounts were mostly negotiated in the first half of 2005. It took more than two years from that time before half the repairs were completed.

Figure 2. Housing repair progress



No price indices for construction materials exist in the Maldives, but the contracted values of the reconstructed houses give an indication of the level of inflation in construction costs. The estimated cost per house was US\$ 19,500 in the National Reconstruction and Rehabilitation Programme (May 2005) while some of the early small contracts were carried out at a rate of about US\$ 18,000 each. The larger contracts, that were bid later on, came in far higher at about US\$ 30,000. However, the bid prices in 2007 have gone up further. The average price per house was USD 48,000 for the latest projects. Thus, over time the prices more than doubled. While this is due to a variety of factors, the increase in material and transport costs is an

² Only the two southern-most atolls, Gnaviyani and Seenu, were not seriously affected.

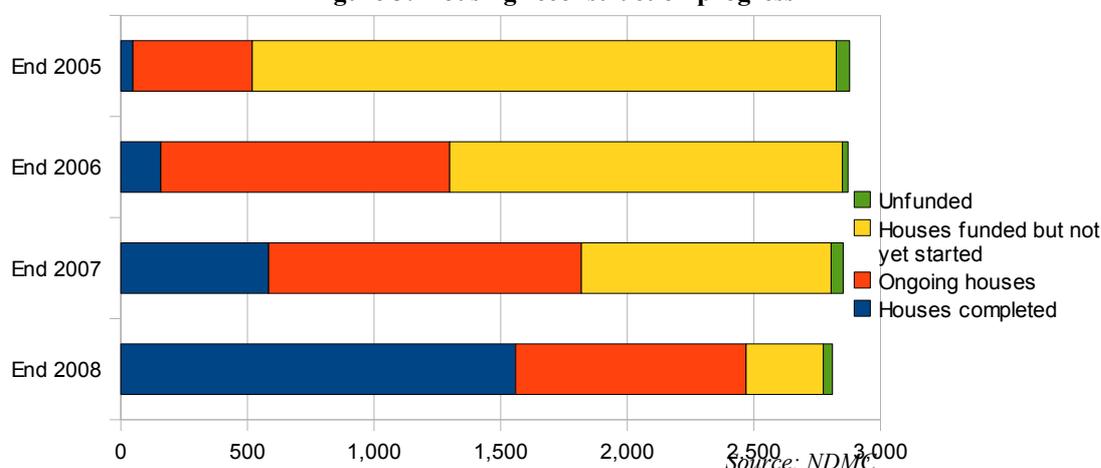
important contributor, which applied equally to the repair costs. So, many households did not have enough money to complete the repairs when the subsequent payments came due as prices had gone up.

e) Housing reconstruction

The first 48 houses were finished by the end of 2005, one year after the tsunami. During 2006, another 110 houses were completed, bringing the total number of houses that were completed two years after the tsunami to 158. At the end of 2007, 584 new houses had been handed over to their owners. Thus, during that year another 326 houses were completed.

By the end of 2008, the housing reconstruction had crossed the half-way mark in that more than half of all new houses to be built had been handed over to their owners. During the year 2008, about 1200 were completed. At the end of the year, therefore, still about 45% of the required new houses had not yet been completed. Of these, the construction of 350 houses had only just been started and another 550 houses were in various stages of completion. For about 10% of the households that lost their homes due to the tsunami, construction of their new residences had not yet started at the end of 2008.

Figure 3: Housing reconstruction progress

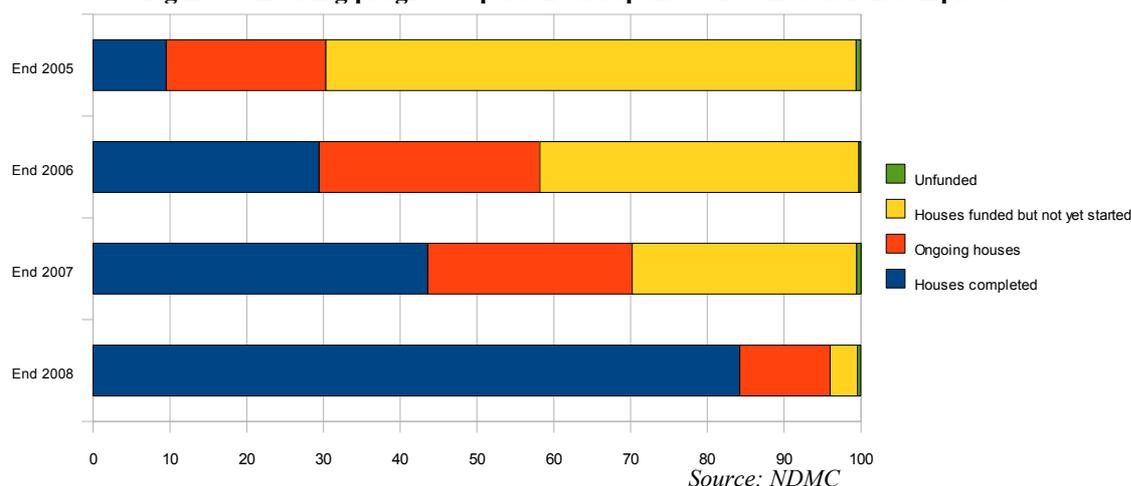


One of the main achievements during the year was the completion of the new island of R. Dhuvaafaaru. Even though not all infrastructure is yet complete, the entire population of the nearby, devastated island of R. Kadholhudhoo had moved to their new houses by the middle of December 2008. On the other hand, contracts for the new houses for the four islands in Gaafu Alifu Atoll were only awarded in November 2008, while the foundation for the first 55 houses on M. Kolhufushi was laid on 24th October of 2008 only.

In some islands, the tsunami reconstruction effort was combined with the ongoing Population Development and Consolidation Programme (PDCP). Under the programme various island communities opted to move to larger, safer islands on a voluntary basis. Thus, the 200 houses built on G.Dh. Nolvivaranfaru, the 43 on Sh. Maroshi, the 100 on K. Thulusdhoo and the 109 on Dh. Kudahuvadho were meant for IDPs rather than locals that had lost houses. For instance, half the population of Dh. Rimbudhoo moved to shelters on K. Thulusdhoo and will move to permanent residences constructed for them on the island. The entire population of Dh. Gemendhoo moved to the atoll capital Dh. Kudahuvadho, first in houses with families and a little later in temporary shelters. They have now been housed in permanent housing in Dh. Kudahuvadho. The population of Dh. Vaanee also resettled on Dh. Kudahuvadho.

Similarly, following the tsunami, the population of M. Madifushi Island decided to accept the invitation of A.Dh. Maamigili island and to move permanently to this big island, which has ample employment opportunities, since it is so close to major tourist facilities. The 38 houses provided to these evacuees were among the first to be completed, within one year after the tsunami.

Figure 4: Housing progress – percent of repairs & reconstruction completed



From the perspective of the affected population, the availability of decent housing is the critical factor, not whether these houses have been repaired or newly constructed, as that depends on the seriousness of the damage incurred at the time of the tsunami. Combining the progress charts given in figures 2 and 3 above provides information on the overall situation with respect to the rehabilitation of lost or damaged housing. This is presented in Figure 4.

f) Measles immunisation coverage

Table 2 shows the measles immunisation coverage for the country from the five-year period 2001 to 2006. As may be noted, coverage is nearly universal. The dip in 2004 was probably caused by the discontinuation of the programme in the final week of the year after the tsunami disaster. The relatively low coverage in the next year was probably also affected by the tsunami and its subsequent dislocations of target populations.

Thus even though there was a slight dip in vaccinations following the tsunami, the coverage remains nearly universal also for this period. On average only one in thirty children was missed out, as against one in sixty in the three preceding years.

Table 2. Measles immunisation coverage, 2001-2006

Year	Children vaccinated	Eligible children	Coverage
2001	5,433	5,515	98.5%
2002	4,979	5,055	98.5%
2003	5,980	6,075	98.0%
2004	5,264	5,490	96.0%
2005	5,062	5,218	97.0%
2006	5,680	5,826	97.5%
Average	5,400	5,530	97.6%

Source: MOH

The information is not available at island level, so that it is not possible to separate the rates for those directly affected by the tsunami and others. However, it should be noted that those worst affected moved to islands with a functioning infrastructure and therefore had as easy access to all health, education and social services as the original populations on the host islands. It would therefore be surprising if differences exist between the two groups on any particular island, and thus in total.

g) Contraceptive prevalence rate

Over the ten-year period from 1997 to 2006, the contraceptive prevalence rate for the republic changed by about five percentage points to slightly less than one-quarter of the reference population. In the capital the rate more or less doubled to just over a quarter of the couples while it changed by only 10% in the atolls. The information is summarised in Table 3.

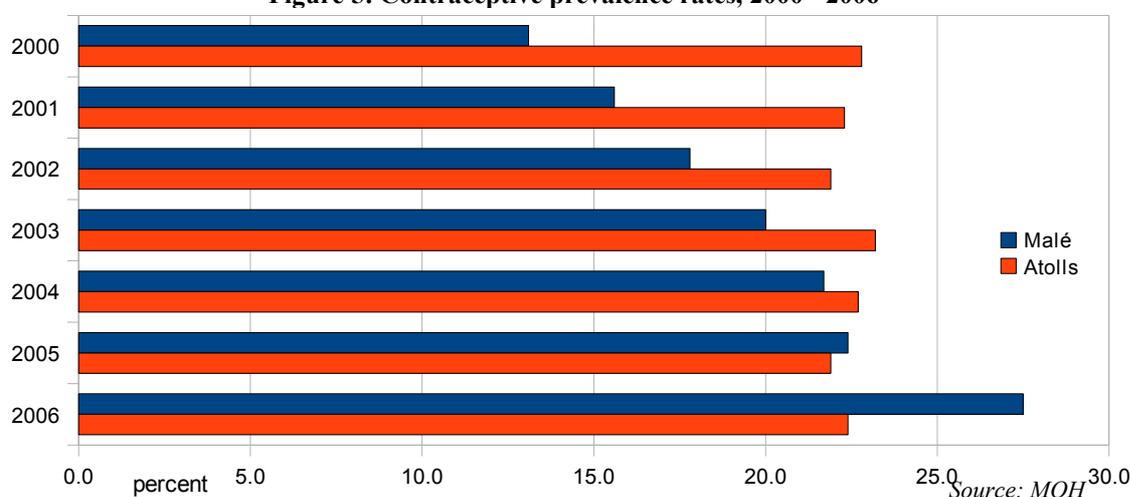
The movement of the prevalence rate in the atolls for the period immediately before and after the tsunami does not show any significant change with the 2005 rate equal to the 2002 rate and the 2006 rate slightly higher than the 2001 rate. Actually, for the period since 2000 the rate in the atolls has fluctuated in a very narrow band of only about 5%, without a trend.

Table 3. Contraceptive prevalence rate

Year	Republic	Malé	Atolls
1997	18.1	13.3	20.1
1998	18.5	13.6	20.4
1999	19.3	15.7	20.7
2000	18.9	13.1	22.8
2001	20.4	15.6	22.3
2002	20.8	17.8	21.9
2003	22.1	20.0	23.2
2004	22.4	21.7	22.7
2005	22.0	22.4	21.9
2006	23.7	27.5	22.4

Source: MOH

Figure 5: Contraceptive prevalence rates, 2000 - 2006



Outcome indicators

The following outcome indicators for Vital Needs are available for Maldives:

- Children under 5 who are underweight
- Children under 5 who are wasted (moderate and severe)
- Children under 5 who are stunted (moderate and severe)
- Low birth weight
- Children under 5 who had diarrhoea any time past 14 days
- Infant mortality rate
- Maternal Mortality Ratio
- Population with worse functioning (WHODAS II)
- Population under stress or with poor well-being

Only for infant mortality rate and maternal mortality ratio, are data published regularly. For the people's psychological well-being, data are only available for mid-2005, from the TIAS survey.

a) to g) Summary

Table 4 provides an overview of the values for the various indicators as these have been published. For a few indicators, more detailed information is available as described further on.

a) to c) Malnutrition

Between 1996 and 2007, there are five observation points for the measurement of malnutrition amongst young children. These are the Multiple Indicator Cluster surveys (MICS) of 1996 and 2001; the Vulnerability and Poverty Assessments (VPA) of 1997 and 2004; and the IYCF KAP referring to 2005. Both the two MICS and the two VPAs use the same methodology for their respective surveys. MICS and VPA surveys are compatible in design and the results should therefore be broadly similar.

The methodology used for the IYCF KAP (*Infant and Young Child Feeding practices: Knowledge, Attitudes, Practices*) survey is not known and is probably incompatible with the other four surveys which are large-scale household surveys. This would explain the relatively large differences observed between 2004 and 2005. For the year 2009, the ongoing DHS (Demographic and Health Survey) will provide updated information for these indicators.

The percentages given against all three measures for all the years in Table 4 indicate moderate and severe malnutrition defined as more than two standard deviations from the average. For 2001, MICS also reports on severe malnutrition, defined as more than three standard deviations below the average. Some 11% of children under-5 are severely underweight, 1.4% severely wasted and 7% severely stunted.

The occurrence of malnutrition in the Maldives has less to do with poverty than with an undiversified menu.

In the Maldives, no large scale surveys have been undertaken, either before or after the tsunami, to determine household food consumption. The 1993 Male' household survey as well as the subsequent nation-wide surveys of 1997 (VPA), 2002 (HIES) and 2004 (VPA-2) did collect information on the quantity and value of food purchases and consumption but consistent results could not be obtained. The soon to be published UNICEF-supported micronutrient study in the Maldives stands to add significantly to knowledge in this regard.

Table 4. Summary information on Vital Needs outcome indicators

The various smaller surveys undertaken over time have indicated that the average diet lacks a proper balance of vitamins and micro-nutrients. The consumption of green vegetables and pulses, for instance, is

Year	Children under 5 who are underweight	Children under 5 who are wasted	Children under 5 who are stunted	Low birth weight (<2500gr)	Under 5 children who had diarrhoea any time in past 14 days	Infant mortality rate	Maternal Mortality Ratio	Actual number of maternal deaths
1996	43%	17%	30%			30		
1997	45%	20%	36%			27	262	16
1998						20	158	9
1999						20	115	6
2000						21	78	4
2001	30%	13%	25%		4.4%	17	143	7
2002						18	160	8
2003				9.1%		14	78	4
2004	31%	20%	22%	9.1%		15	96	5
2005	21%	13%	17%	9.0%		16	72	4
2006				9.4%		13	69	4
2007				* 5.1%		10	46	3

Sources: MICS1(1996) MICS1(1996) MICS1(1996) Statistical yearbooks
VPA1 (1997) VPA1 (1997) VPA1 (1997) (various issues)
MICS2 (2001) MICS2 (2001) MICS2 (2001) MICS2 (2001)
VPA2 (2004) VPA2 (2004) VPA2 (2004) VRS/ MbH
IYCF KAP (2005) IYCF KAP (2005) IYCF KAP (2005) (various years)

* Preliminary

very low due to the limited agricultural possibilities on the small islands and animal proteins for most part are obtained from tuna fish.

d) Low birth weight

The vital registration system (VRS) maintains records of the birth weights of all newborn children registered in the system. Although these are not regularly published or included in the statistical yearbook, the information is available from the Ministry of Health. For the period 2003 to 2006, about 9% of the births fall within this category. The preliminary data for 2007 show a sharp reduction to only 5%, but this may be due to incomplete information.

e) Children under 5 who had diarrhoea any time past 14 days

The only dataset that provides information on this item is the MICS 2001 survey. For 2001 it was found that 4.4% of the under-5 children had experienced diarrhoea during the preceding 14 days.

f) Infant Mortality Rate

Detailed information on the infant mortality rates (IMR) by sex and urban (Malé) and rural (atolls) populations is given in Table 5. The distribution is based on the place where the births have occurred and not where the mothers normally live. This may, especially in the earlier years, have influenced the rates as Malé has the best health facilities in the country, where cases with expected birth complications were often referred to.

There were ten infants amongst the tsunami deaths in the atolls of Maldives. Even then, the IMR for 2004 was substantially lower than that for the preceding years and in the years following the tsunami, the infant mortality rates in the atolls remained at the same low level. As the number of occurrences of infant deaths is relatively low, the averages for three periods are also given at the bottom of the table.

Table 5. Infant mortality rate by sex, Malé and atolls, 1992 - 2007

Year	Republic			Malé			Atolls		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
1992	31	34	27	38	39	36	29	33	25
1993	34	35	33	33	33	34	34	36	33
1994	30	31	28	36	40	32	28	30	27
1995	32	32	31	36	37	36	31	31	30
1996	30	34	25	21	24	17	32	37	27
1997	27	27	27	15	13	17	31	32	31
1998	20	20	21	21	18	25	20	21	19
1999	20	21	19	13	16	10	23	23	23
2000	21	22	20	17	19	15	23	23	23
2001	17	17	18	13	13	14	19	19	20
2002	18	19	16	15	21	9	19	18	21
2003	14	15	13	8	13	3	18	17	18
2004	15	16	13	10	14	6	18	17	19
2005	12	11	13	12	8	16	12	14	10
2006	16	18	13	13	14	12	18	21	15
2007	10	14	6	9	12	6	11	15	6
Averages									
92-97	31	32	29	30	31	29	31	33	29
98-03	18	19	18	15	17	13	20	20	21
04-07	13	15	11	11	12	10	15	17	13

Source: MCH

The infant mortality rates for the mid-90s were broadly similar for the atolls and Malé as well as for the sexes. In the years around the end of the century, there was a distinct difference in the levels between Malé and the atolls, which continued into the period after the tsunami. Over this last period, the average IMR was

about one-third of that in the earliest period for Malé while the IMR had been reduced by about half over the same period in the atolls.

g) Maternal Mortality Ratio

In the Maldives, the Maternal Mortality Ratios (MMR) show a clear downward trend over the years, but with substantial fluctuations. These fluctuations are only due to the fact that there are only a few maternal deaths in any one year, as can be seen in Table 6. In the first four years in the table, there were on average less than nine deaths; in the years 2000-2003 this went down to only six and in the last four years the number was only four per year. At such low numbers, a single death translates into a change of 20-25% in the ratio.

The low number of maternal deaths in the country also makes it meaningless to prepare separate time series for Malé and the atolls as those would fluctuate even more than the series given in Table 6.

Table 6. Maternal mortality ratios

Year	Maternal Mortality Ratio (per 100,000)	Actual number of maternal deaths
1997	262	16
1998	158	9
1999	115	6
2000	78	4
2001	143	7
2002	160	8
2003	78	4
2004	96	5
2005	72	4
2006	69	4
2007	46	3

Source: MOH

h) and i) People's psychological well-being

In the immediate aftermath of the tsunami, the government sent teams of volunteer councillors out to the islands to assist the people deal with their psycho-social problems. Following this immediate response, various organisations started organising long-term support by training Maldivian volunteers. One of the largest of these programmes was conducted by the American Red Cross in coordination with the Ministries of Gender and Family; Education and Health. Since 2006, psycho-social support programmes have been conducted on 76 islands with more than 63,000 beneficiaries. Furthermore, about 1,400 teachers and other volunteers were trained and local capacities were built for the development and implementation of psycho-social support programmes. Other activities were undertaken by Care Society, United Nations fund for Population Activities (UNFPA), UNICEF and World Health Organisation (WHO).

A socio-economic study, the Vulnerability and Poverty Assessment II (VPA II)³ has been conducted by the then Ministry of Planning and National Development just six months prior to the tsunami. The government decided to repeat the survey, with some modifications to obtain tsunami-specific information, six months after the tsunami⁴. The sample selection was modified to ensure that the information for the different tsunami impact groups was not only representative but also accurate. This was accomplished by increasing the sample size for the most-affected communities and (to keep overall costs under control) reduce the sample size on the least affected islands.

This Tsunami Impact Assessment Study (TIAS) included a special psycho-social component which was administered only to the people who at the time of the tsunami lived on the fourteen most affected islands (those that were evacuated following the tsunami)⁵. This questionnaire was administered by health workers rather than the regular enumerators and took place at the locations where the households were located at the time of the survey. The results showed that six months after the tsunami a majority of the respondents continued to suffer effects such as difficulty in sleeping and eating. They also had less confidence in the future and worried about the security of their families. No assessments have been undertaken since that time and therefore the present situation is not known.

As might be expected from a population deprived of their own houses and living in temporary shelters, the main cause of worry is the housing situation. This is followed by worries about the children's future and by compassion with respect to the way family and friends have been affected. The information is given in the

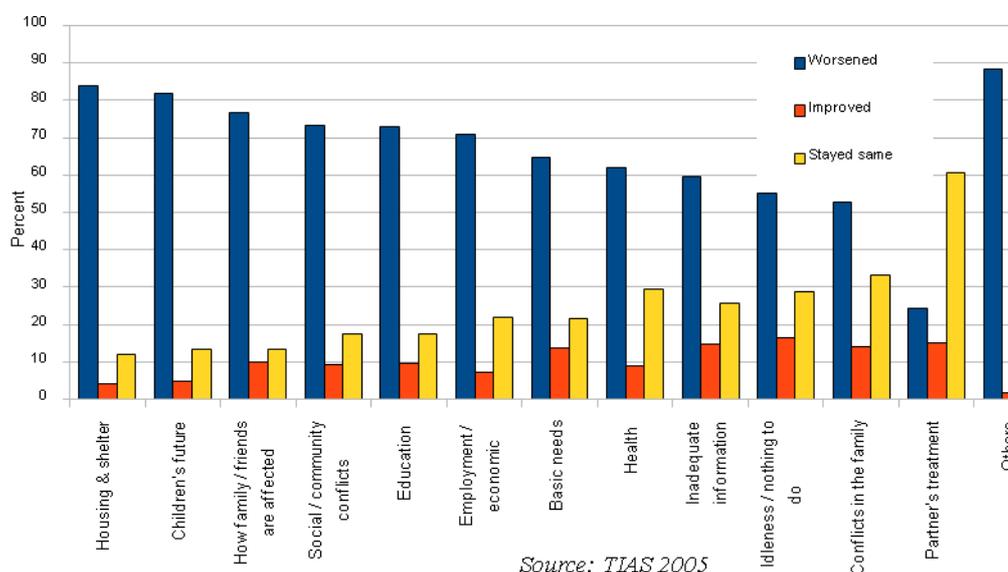
³ *The Vulnerability and Poverty Assessment II – 2004*

⁴ *Tsunami Impact Assessment Study (TIAS), Ministry of Planning and National Development in co-operation with the United Nations Development Program and the United Nations Population Fund, Male, Republic of Maldives, September 2006.*

⁵ *A total of 854 persons of 15 years and above were interviewed for this component of the survey.*

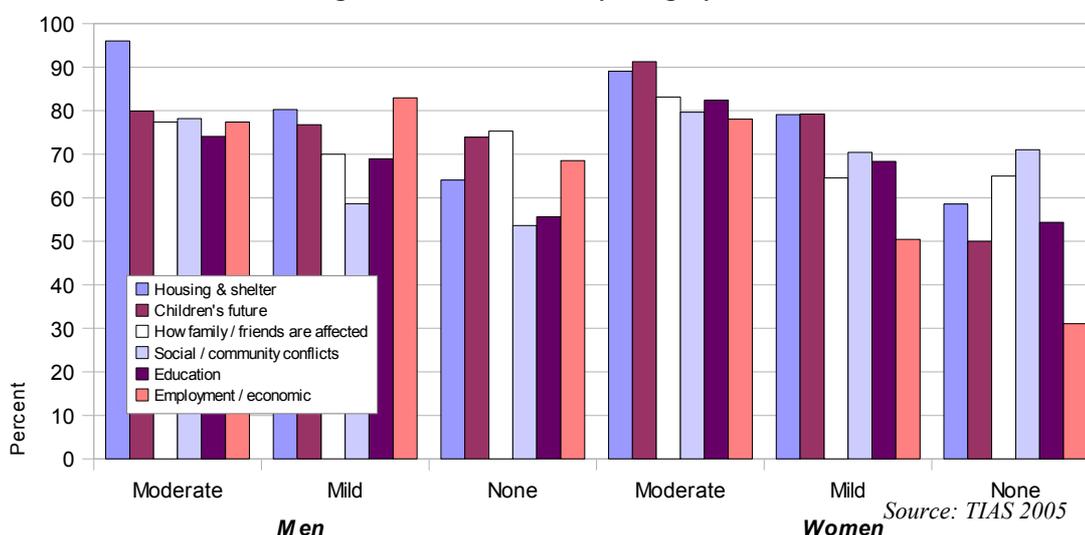
Figure 6. In general, the situation worsened for far more persons than they improved, except for the partner's treatment, where the majority of respondents indicated that it stayed the same. The pattern is the same for women and men, with the exception that men worried somewhat more about employment. It is their fourth most-important concern as against the sixth for women and overall.

Figure 6: Worries expressed by most affected tsunami victims



For the six main worries, given in Figure 7, the information has been further dis-aggregated by psycho-social group and sex. In general the moderately affected people had more worries than those mildly affected by the tsunami and those again more than the people classified as not affected. On average, men worried more about housing and employment while women were more worried about family and community.

Figure 7: Main worries by category and sex



Due to their prolonged stay in the temporary shelters, from time to time tensions developed within the communities of IDPs as well as between those of the IDPs and the population of the host islands. These were clear expressions of the frustrations that were building up amongst the IDPs because of the perceived slow progress in the reconstruction effort and continuing uncertainty about their future. With more and more IDPs returning to their permanent houses, these problems are expected to diminish.

3. The Tsunami Recovery – Basic Services

Output indicators

The following output indicators for Basic Services are available for Maldives:

- a) Primary school children per school
- b) Primary school children per teacher
- c) Hospital beds (in-patient and maternity)
- d) Outpatient consultations per person per year
- e) Children of 12-23 months fully immunised against all antigens
- f) Health facilities with emergency obstetric care
- g) Adequate ante-natal coverage (at least 4 visits during a pregnancy)
- h) People per latrine (for affected people living in temporary shelters)
- i) Tsunami-affected communities consulted by implementing agency

For the indicators a to g, annual data are available. The indicator h was more or less static after the temporary facilities were constructed. Indicator i has been 100% from early on, as all communities were consulted at the different steps in the rehabilitation process.

a) Primary school children per school

The number of children per school is given in Table 7 and Figure 8, separately for Malé and the atolls for the school years 2003 to 2007. There are some fluctuations in the number of schools in the atolls over those years due partly to the temporary relocation of internally displaced persons to host islands but also as a result of the population consolidation strategy whereby the entire population of a small island moves to a larger island and the children then go to the schools already existing on their new island.

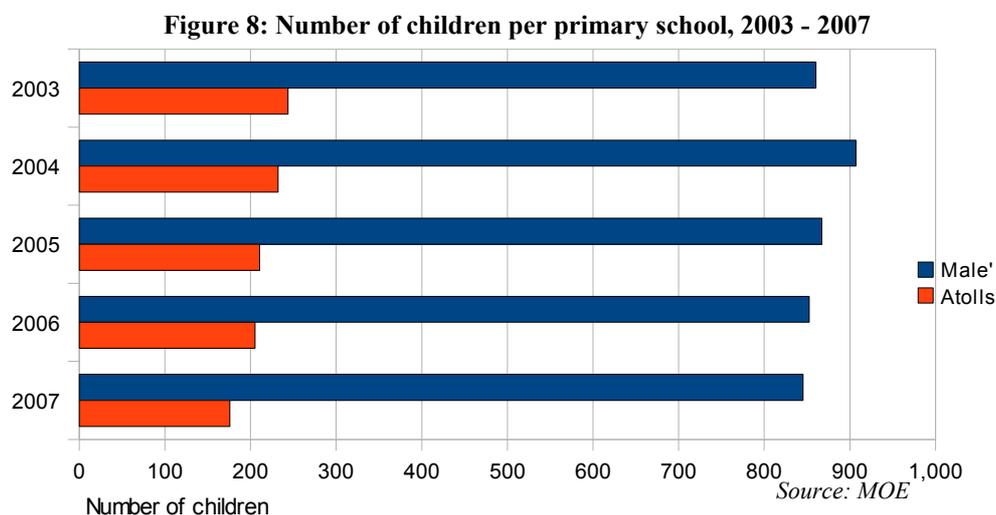


Table 7. Number of children per school

Year	Number of schools	Number of students	Average students per school
Republic			
2003	231	66,169	286
2004	229	63,300	276
2005	225	57,873	257
2006	216	54,692	253
2007	225	50,270	223
Male'			
2003	16	13,763	860
2004	15	13,606	907
2005	16	13,874	867
2006	16	13,639	852
2007	16	13,527	845
Atolls			
2003	215	52,406	244
2004	214	49,694	232
2005	209	43,999	211
2006	200	41,053	205
2007	209	36,743	176

Source: MOE

The data presented in Table 7 show that there is no distinctive deviation from the trends at the time of the tsunami. In most islands the children were back to school soon after the disaster, although sometimes in makeshift facilities. If needed, the increased number of pupils in some islands was catered for by having a morning and an afternoon session for different classes in the same classrooms. This practice has long been in place in Malé.

Over the past decades, population growth rates have been reduced drastically in the Maldives. Together with the urban drift this means that the overall population of the atolls has barely changed between 2000 and 2006, the years of the last two population censuses.

The two lowest five-year age cohorts, however, saw reductions of about one quarter in size between the two years. Such large reductions in potential numbers of pupils will bring the viability of schools on smaller islands under severe stress over the coming ten to fifteen years as there is little likelihood that the trends of either the lower population growth rates or urban drift will be reversed.

The effects of the urban drift can also be seen in Table 8. While the number of school children in Malé remains more or less constant over the five years for which data are given in the table, their number in the atolls was reduced significantly; by about one quarter.

Table 8. Population by locality and low age groups, census 2000 and 2006

Locality and age-group	2006			2000			Difference			Percentage
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes
Republic										
All ages	298,968	151,459	147,509	270,101	137,200	132,901	28,867	14,259	14,608	10.7%
0 – 4	26,171	13,362	12,809	30,912	15,699	15,213	-4,741	-2,337	-2,404	-15.3%
5 – 9	29,867	15,352	14,515	37,927	19,336	18,591	-8,060	-3,984	-4,076	-21.3%
Male'										
All ages	103,693	51,992	51,701	74,069	38,559	35,510	29,624	13,433	16,191	40.0%
0 – 4	7,344	3,744	3,600	5,897	3,004	2,893	1,447	740	707	24.5%
5 – 9	7,538	3,829	3,709	7,043	3,621	3,422	495	208	287	7.0%
Atolls										
All ages	195,275	99,467	95,808	196,032	98,641	97,391	-757	826	-1,583	-0.4%
0 – 4	18,827	9,618	9,209	25,015	12,695	12,320	-6,188	-3,077	-3,111	-24.7%
5 – 9	22,329	11,523	10,806	30,884	15,715	15,169	-8,555	-4,192	-4,363	-27.7%

Source: Department of National Planning, Ministry of Finance and Treasury

b) Primary school children per teacher

A summary of the main characteristics for the period 2003 to 2007 has been given in Table 9 and Figure 9. Class sizes in the Maldives are generally small, although a substantial part of the teachers is not fully trained. Therefore, the table presents two different student teacher ratios, namely one with all teachers as the denominator and a second one with the trained teacher as the denominator. Using the first indicator, the average class size has been less than twenty pupils per teacher for the past few years, both in Malé and the atolls. The ratio of students per trained teacher is about one-third higher, although it is slowly coming closer to the overall ratio as the proportion of untrained teachers is falling.

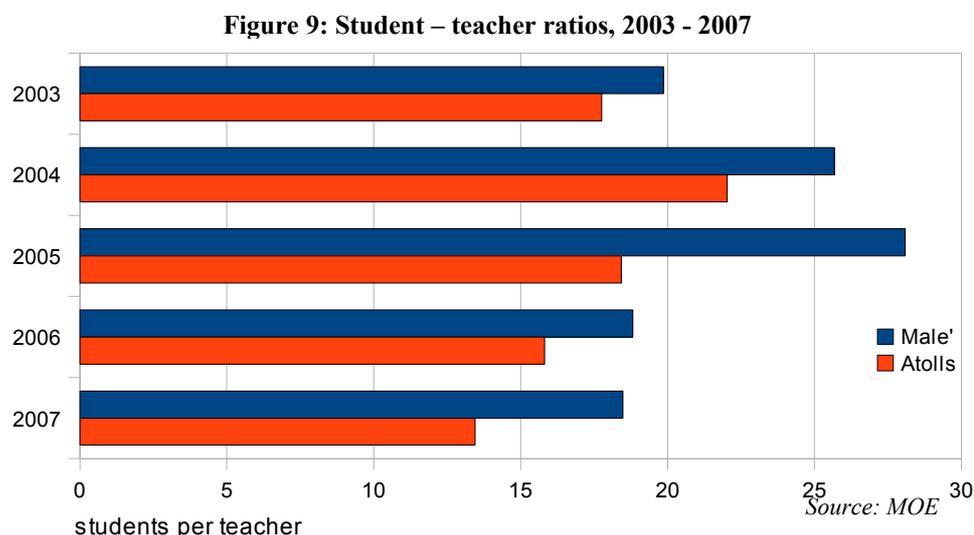


Table 9. Number of students per teacher

Year	Number of teachers	of which: Trained	of which: Expatriate teachers	Number of students	Student Teacher Ratio	Students per trained Teacher
Republic						
2003	3,644	2,216	761	66,169	18	30
2004	2,786	1,793	479	63,300	23	35
2005	2,882	1,746	461	57,873	20	33
2006	3,321	2,241	391	54,692	16	24
2007	3,463	2,321	398	50,270	15	22
Male'						
2003	693	518	163	13,763	20	27
2004	530	452	116	13,606	26	30
2005	494	440	101	13,874	28	32
2006	725	650	115	13,639	19	21
2007	732	656	83	13,527	18	21
Atolls						
2003	2,951	1,698	598	52,406	18	31
2004	2,256	1,341	363	49,694	22	37
2005	2,388	1,306	360	43,999	18	34
2006	2,596	1,591	276	41,053	16	26
2007	2,731	1,665	315	36,743	13	22

Source: MOE

It may be observed that there are many expatriate teachers in the country. These mostly come from India and Sri Lanka and they made up about a third of the trained teachers in 2003. Four years later, only about one-sixth of the trained teachers were foreigners. As a share of the total number of teachers, they represented over 20% of the total in 2003 and this had gone down to slightly more than 10% in 2007.

The share of expatriate teachers in the total has always been a few percentage points higher in the atolls than in Malé but in both areas they have been decreasing rapidly. In parallel, the number of trained teachers has been increasing fast. In 2003, the share of trained teachers amongst locals was about half, while it was nearly two-thirds six years later. Nonetheless, the improvements were mostly in Malé where two-thirds of the teachers were trained in 2003 against nearly 90% five years later. In the atolls, the share of trained teachers amongst locals only changed from a little below 50% to slightly more than 50%.

The tsunami placed a large additional burden on the education system in the atolls but this did not result in large deviations from the trend to smaller class sizes in the country.

c) Hospital beds (in-patient and maternity)

The development of the number of hospital beds in the Maldives over the period 2000 to 2007 is given in Table 10. It shows that the number of available beds has increased three-fold over this period, raising the number of beds per ten thousand population from about 17 to about 45.

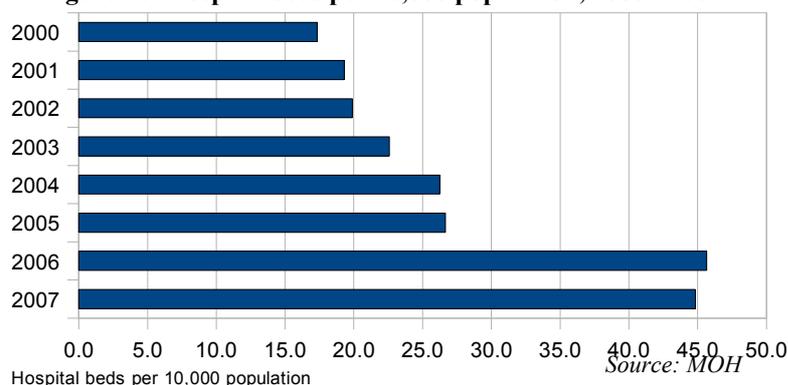
Table 10. Number of hospital beds, 2000 to 2007

Year	Number of Hospital Beds	population per hospital bed	hospital beds / 10,000 popn
2000	470	577	17.3
2001	533	518	19.3
2002	558	503	19.9
2003	643	443	22.6
2004	759	381	26.2
2005	784	375	26.7
2006	1,365	219	45.7
2007	1,367	223	44.8

Source: MOH

Because of its small population size, the health system in the Maldives has been designed in such a way that smaller communities are provided with basic health care facilities and larger communities and regional centres with intermediate services. The referral hospitals for all of the Maldives are located in Malé. It is therefore rather difficult to distribute hospital beds available in the atolls and Malé as the latter includes beds for tertiary care normally used by islanders. Bifurcation of the data would therefore give an under-estimate for the atolls and an over-estimate for Malé. The number of hospital beds per 10,000 population is given in Figure 10.

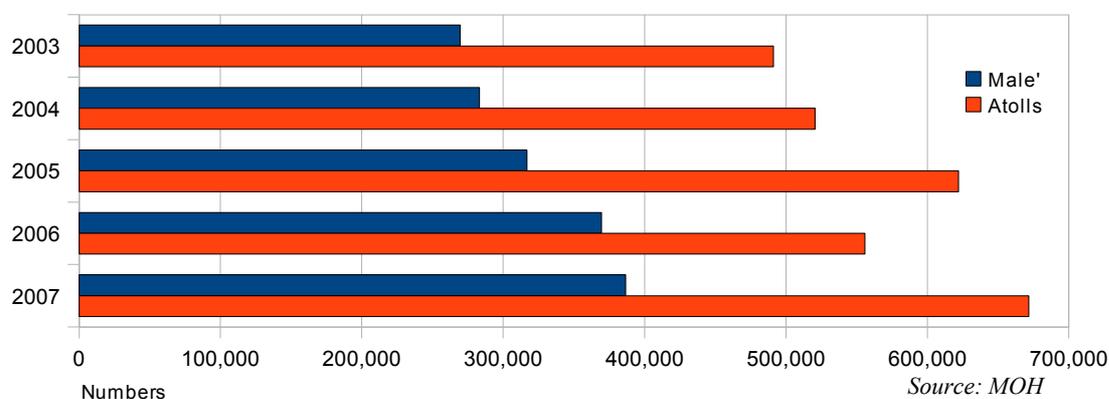
Figure 10: Hospital beds per 10,000 population, 2000 - 2007



d) Outpatient consultations per person per year

The information in Figure 11 and Table 11 presents the out-patient load at Government health facilities. No data are available for the outpatients treated in private hospitals and clinics.

Figure 11: Number of outpatients registered annually at Government health facilities, 2003 - 2007



Approximately 9% of the medical staff in the country works in private clinics and it may therefore be expected that the number of outpatients treated in the country is similarly 10% higher than the counts given in Table 11.

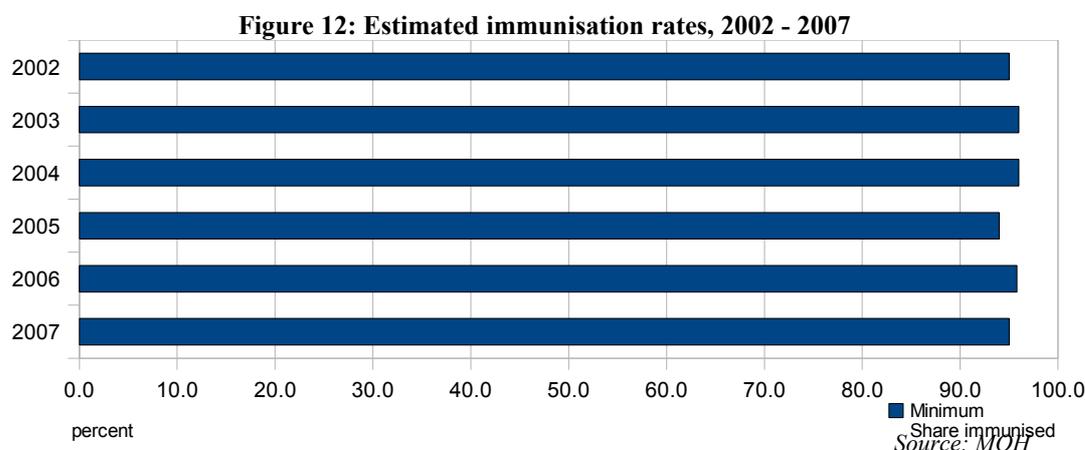
Table 11. Number of outpatients registered annually at Government health facilities, 2003 - 2007

Institutions	2003	2004	2005	2006	2007
Total	760,750	800,442	938,853	925,533	1,058,509
Male'					
All government facilities	269,585	283,226	316,744	369,584	386,670
Indira Gandhi Memorial Hospital	222,911	245,823	261,872	320,857	336,443
Hulhumale' Hospital	0	2,180	10,580	15,786	17,507
Medical Clinics	16,839	9,687	14,292	0	0
Male' Health Centres	29,835	25,536	30,000	32,941	32,720
Atolls					
All government facilities	491,165	520,472	622,109	555,949	671,839
Regional Hospitals*	160,692	156,861	168,523	184,857	194,383
Atoll Hospitals	108,349	136,323	154,139	165,775	196,341
Atoll Health Centres	222,124	227,288	299,447	205,317	251,198
Health Posts	0	0	0	0	29,917

* M. Muli: Data for 2004 only up to August 2004, Other records were lost in tsunami wave
 Full year estimated as 1.5 times visits during first eight months
 Source: MOH

There was a surge in the number of outpatients treated in the atolls during 2005 which probably has to do both with the direct effects of the tsunami as well as the poorer living conditions of the displaced persons in the early months of the year.

e) Children of 12-23 months fully immunised against all antigens



The information on immunisation published is not tabulated by age of the recipients, nor is the information on all immunisations received by individual children available. The Department of Public Health uses the recommended schedules for its immunisation programme and on that basis the vaccinations listed in Table 12 are normally administered before the child reaches the age of two years.

The immunisation rates in the Maldives are so high that any differences due to the non-availability of records for individual children will not make substantial differences to the rates given as the lowest individual vaccinations for each year.

Table 12. Immunisation coverage of children 12-23 months, 2002- 2007

(Percent)

Year	Minimum Share im- munised	Measles	Bacillus Climate Guerin (BCG)	Diphtheria Pertussis Tetanus (DPT)			Tetanus-toxoid (TT)			Hepatitis B			Oral Polio Vaccine (OPV)			
				1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	4th
2002	95.0	96.9	98.5	98.5	98.0	97.5	96.0	96.0	95.0	98.5	98.0	97.5	98.5	98.0	97.5	97.0
2003	96.0	98.0	98.0	98.0	97.6	97.5	97.0	97.0	96.0	98.0	97.6	97.5	98.0	97.6	97.5	97.0
2004	96.0	96.0	98.0	98.0	97.5	97.0	97.0	96.5	96.0	98.0	97.5	97.0	98.0	97.5	97.0	96.5
2005	94.0	97.0	99.0	99.0	99.0	98.0	96.0	95.0	94.0	99.0	99.0	98.0	99.0	99.0	98.0	98.0
2006	95.8	97.5	99.2	99.2	98.5	97.9	97.1	96.5	95.8	99.2	98.5	97.9	99.2	98.5	97.9	97.5
2007	95.0	97.0	99.0	99.0	98.6	98.0	97.0	96.0	95.0	99.0	98.6	98.0	99.0	98.6	98.0	97.0

Source: MOH

The rates for all years are well over 90% of the eligible children. The relatively low rate of 94% for 2005 is entirely due to the lower rate for the TT vaccinations in that year. Actually, for all years the minimum immunisation rate is for the 3rd TT vaccination. There is no significant difference in the immunisation rates before and after the tsunami.

f) Health facilities with emergency obstetric care

The dispersed nature of the country results in limited emergency health care for most of the people living on the islands outside the atoll capitals. Because of the high cost involved, this situation is not likely to change. The same is the situation for emergency obstetric care, although women with expected difficulties during delivery are urged to move to islands with hospitals during the latter part of their pregnancy. However, not all women do have that option as they do not have relatives on such islands and thus have no place to stay.

At the moment, there are seven regional hospitals and 11 atoll hospitals⁶ all of which provide emergency obstetric care. In Malé there are several facilities providing these services. In effect, this means that the atoll population living away from the island with the regional or atoll hospitals are deprived of emergency services. That varies from none in Gnaviyani atoll, which is a single island, and less than half in Seenu atoll, which consists mostly of inter-connected islands, to nearly 90% in Thaa, Noonu and Shaviyani atolls. Overall, about 72% of the island population is deprived of emergency obstetric care. While this high, it is a significant improvement on 2000 when there were no atoll hospitals and only five regional hospitals. The island population without access to emergency services then was about 88%, or seven out of eight islanders.

g) Adequate ante-natal coverage (at least 4 visits during a pregnancy)

According to the MICS 2001, about 77% of the pregnant women had ante-natal check-ups during pregnancy. The RH Survey of 2004 indicated that this had increased to 91%. No information is available for the subsequent years as no new surveys have been completed in this field. The ongoing DHS will provide an update. As health facilities were operational for all but a short time after the tsunami, it is unlikely that the rate has decreased significantly.

h) People per latrine (for affected people living in temporary shelters)

The number of people per latrine depends on the type of temporary shelters built on an island, but in general not more than 12 persons use one latrine. This is the maximum number of persons using the 3-room temporary apartments that have been constructed most commonly. These units have one toilet each. The single rooms have separate toilet blocks for communal use. Altogether, at the end of 2005, there were about 5400 IDPs living in temporary shelters and more than 600 toilets were available for them. On average, therefore, one toilet was available for every 9 persons in temporary shelters.

i) Tsunami-affected communities consulted by implementing agency

All communities affected by the tsunami have extensively been consulted on the modalities for rehabilitation and resettlement. In a number of cases, these consultations took so much time that they delayed the implementation of reconstruction activities. Especially with regards to the decisions whether to return to the original islands or to resettle on other inhabited islands, the opinions of both the displaced and the host communities were of paramount importance. There was no forced resettlement for any of the affected communities.

The design of houses, harbours and various other facilities was discussed with the communities and where possible adjusted according to demands, keeping in mind the cost implications of the requests. For instance, the International Federation of Red Cross and Red Crescent societies (IFRC) has maximum specifications for houses that can be funded under its reconstruction programmes. In a number of cases these were deemed insufficient for the needs of some households, for instance because of the practice of having extended households in the same premises, and the Government stepped in to fund those units. For instance, of the 600 houses constructed on R. Dhuvaafaaru, 38 were funded by the government⁷ for this reason.

⁶ *Kaafu atoll does not have an atoll hospital as the capital Malé is situated there.*

⁷ *The UAE Red Crescent society later on took over the funding of these houses.*

Outcome indicators

The following outcome indicators for Basic Services are available for Maldives:

- a) Net Primary school enrolment ratio
- b) Primary school drop-out rate
- c) Births attended by a skilled birth attendant

a) Net Primary school enrolment ratio

The net enrolment ratios for various levels of education, have been presented in Table 13 below. It may be noticed that throughout the period from 1998 to 2007 the net primary enrolment rate has been about 100%. In other words, nearly all eligible children attend school. As the denominator of the ratio is the projected population for the specific age groups, minor discrepancies might creep in as those models rely on old fertility data, even if interpolated between census years. This is especially relevant for the calculations at more detailed level, such as those in the table separately for Malé and the atolls, as the migration patterns in the projections are assumed to be more or less linear while they are mostly driven by outside forces not taken into account in the model.

Therefore, it may be possible that the ratios are not entirely accurate although any errors may be minor. Lately there have been news reports that on some small islands girls are discouraged or forbidden to go to school. While this may be the case, the effect of such a small number on the overall ratio does not show in the statistics. Upon receiving the reports, the Ministry of Education has started an investigation as universal free primary education is an important policy objective of the government.

Table 13. Net Enrolment Ratio by Level and sex, 1998 - 2007

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
<i>Both sexes</i>										
Primary (1 - 7)	99	99	98	98	100	100	100	100	100	99
Lower Secondary (8 - 10)	22	28	37	43	44	52	55	63	66	69
Higher Secondary (11 - 12)	2	1	1	1	2	2	4	7	6	4
<i>Boys</i>										
Primary (1 - 7)	100	99	99	99	100	100	100	100	99	98
Lower Secondary (8 - 10)	21	26	34	38	40	47	50	58	61	65
Higher Secondary (11 - 12)	na	na	na	1	2	2	4	7	6	5
<i>Girls</i>										
Primary (1 - 7)	98	98	97	97	100	100	100	100	100	100
Lower Secondary (8 - 10)	24	30	40	47	48	56	60	67	70	74
Higher Secondary (11 - 12)	na	na	na	1	2	2	4	7	5	3

Source: Ministry of Education and own calculations based on Census 2006

b) Primary school drop-out rate

No specific information is published on the subject although progression rates from one grade to the next are available. As those not progressing to the next grade generally remain in school rather than dropping out, this information can not be used to derive a drop-out rate. As primary education is free and universal in the Maldives, there is barely any drop-out at this level of education, as is also indicated by the estimated net enrolment ratios given in Table 13 above.

c) Births attended by a skilled birth attendant

The MICS 2001 sample survey indicated that 97% of the women that had given birth in the previous year had their deliveries attended by trained personnel. In about half the cases that included a doctor. The vital registration system showed that in 2005 92% of the deliveries were attended by trained personnel; in 2006 this was 95% and the preliminary numbers for 2007 indicated that it was 97%.

No comprehensive data for earlier years is available from the VRS. The 2001 MICS data is not comparable to the VRS data as the former included a sample of less than 3% of the births only while the latter has more or less comprehensive coverage. In effect that means that probably there was not a significant drop in the rate due to the tsunami.

4. The Tsunami Recovery – Infrastructure

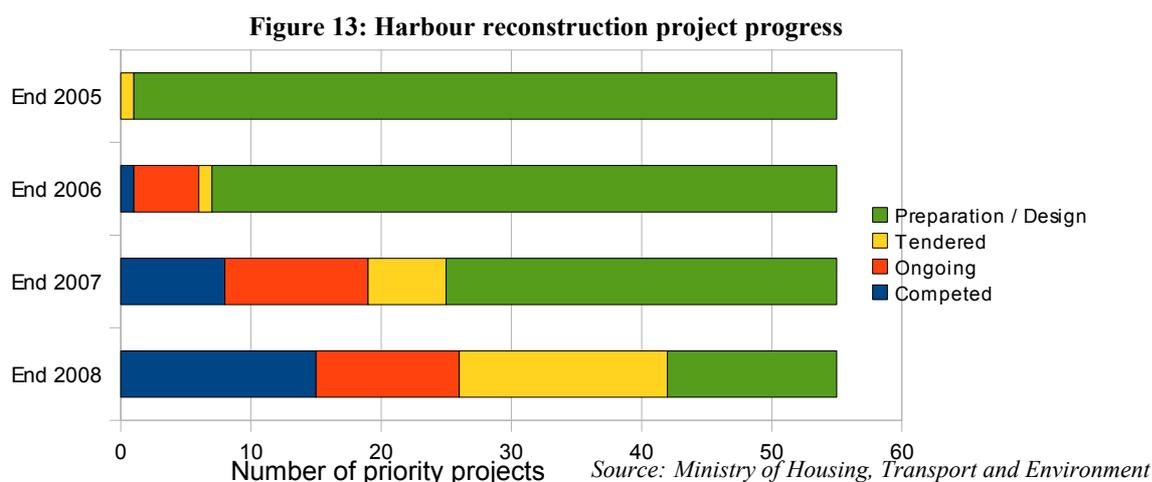
Output Indicators

The following output indicators for Infrastructure are available for Maldives:

- Harbours/jetties rehabilitated
- Destroyed/damaged schools rebuilt or rehabilitated, by category
- Destroyed/damaged health facilities rebuilt or rehabilitated, by category
- Length of coastal protection constructed/repaired, by type
- Water – reconstruction and installation of facilities
- Sewerage – reconstruction and installation of facilities
- Administration – reconstruction of facilities
- Electricity / Energy – reconstruction of facilities

a) Harbours/jetties rehabilitated

In more than half the inhabited islands of the Maldives, the tsunami destroyed or seriously damaged harbours and jetties. Out of the 104 islands initially identified for repair of the harbours or jetties, 55 were selected for early attention. Out of the 55 islands indicated above, 9% was under construction, and 2% completed at the end of 2006. One year later 18% was under construction and 15% completed. By the end of 2008, these had changed to 20% and 27% respectively. By April 2009, Government records reported 21 of the 55 projects completed (38%).



The rather slow rate of progress in this sector is caused by a variety of reasons. First, some interventions were complex and required substantial preparation time. This was, for instance, the case in R. Dhuvaafaru for which all infrastructure needed to be designed from scratch as the island was not previously inhabited. For the work in Th. Vilufushi specialised dredging equipment was needed for the preparation of the island, including its harbour, for inhabitation. The same equipment, being in the area, was subsequently used to rebuild the harbours of two islands in Gaafu Alifu atoll.

Another reason for slow progress was the difficulty of securing funding for these projects. For this activity, funding of \$80m was requested. At the end of 2007, only 53% of that amount had been committed, making it both the sector with the lowest share in commitments and the highest funding gap (\$37.6 m) in dollar terms.

That by the end of 2007 only a quarter of the committed funds had been expended suggests other reasons for slow progress. Mismatches between the designs prepared and the aspirations of the island communities were another reason for delays as these require additional modifications, further consultations and additional

funding. In some cases, the island population also blocked contractors who had started with the work. Some of the projects were subsequently abandoned.

b) Destroyed/damaged schools rebuilt or rehabilitated

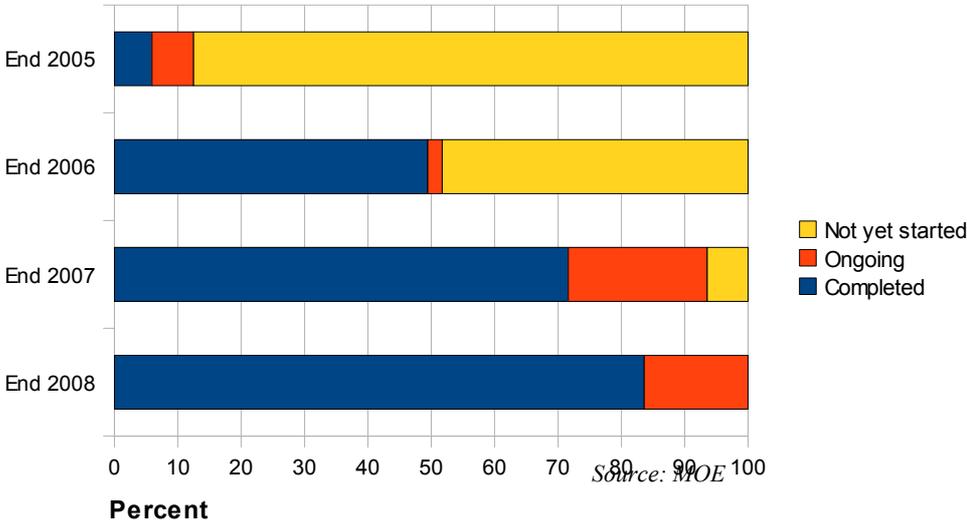
The Maldives has achieved the goal of universal primary education. This is an enormous achievement for a Least Developed Country (LDC), especially one country with such a complex infrastructure. Even while achieving these outstanding results, the improvement of education on the islands continued to receive much Government attention. The purpose was to improve the quality of the education. A multi-prong approach was used, covering improvements to the educational facilities; the addition of teachers and improvement of their skills; and a greater emphasis on secondary education once universal primary education was achieved. With the increased demand for enrolment in higher grades, schools on many islands could add higher grades. The population consolidation programme further improved the availability of facilities, including educational ones, on their home islands as the average population size increased over time.

These enormous achievements were dealt a heavy blow on 26th December 2004. A large number of schools were destroyed or damaged. Much of the furniture and equipment was washed away or made unusable. Many schools and their students also lost all their textbooks, stationary and study notes. Furthermore, student’s performance records and report cards were gone.

Three tsunami school recovery projects provided water tanks, furniture and equipment. About 225 other projects were implemented to repair and rebuild schools and related facilities such as toilets, teachers’ quarters and boundary walls. Teacher Resource Centres (TRCs) were established with help from UNICEF in each of the 20 atolls of the Maldives, providing teachers and students with broadband internet resources for teacher training and on-line learning.

The restoration of basic services was extremely fast. Within a few months of the tsunami students were back in schools again across the nation. Those schools might have consisted mostly of tents or the remnants of the previous buildings; and basic facilities like drinking water and toilets might be missing, but textbooks and stationary had been provided along with basic equipment and furniture.

Figure 14: Reconstruction of education facilities



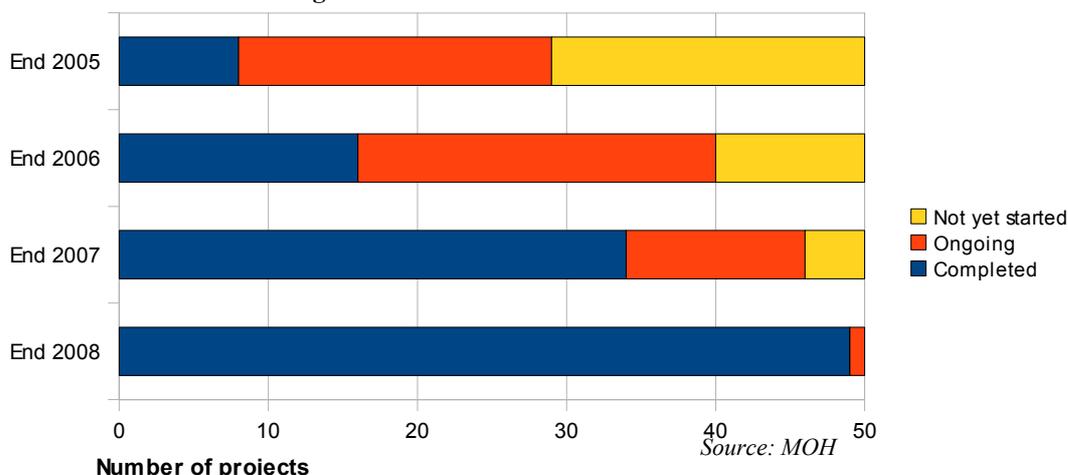
The actual reconstruction of damaged or destroyed infrastructure took substantially longer, of course. Schools and other educational infrastructure totalling about US\$ 15.5m were destroyed by the tsunami. By the end of 2005, only 5% (by value) of planned reconstruction work of educational facilities had been completed. By the end of 2006, this had increased to about 42% of the total and was nearly complete by the end of 2008. The main project still under construction was the new high school building in L. Gan. The information is shown in Figure 14.

c) Destroyed/damaged health facilities rebuilt or rehabilitated

Many health facilities and much specialised equipment was destroyed or damaged during the tsunami. Health facilities on 40 islands (spread over 50 projects) were repaired or reconstructed, including those on the new islands of R. Dhuvaafaru and Th. Vilufushi. It covered work on 28 health posts, 17 health centres, two atoll hospitals and two regional hospitals. Work on five of them was finished during 2005, a further 20 were completed in 2006. Of the remaining nine, six were finished in 2007, two in 2008 and the final one, the new building for the regional hospital in L. Gan, will be completed in 2009.

The inhabitants relocated from the four destroyed islands retain the same level of health services on their new islands as before, or got improved services in their new islands. Those moving to the newly constructed islands of R. Dhuvaafaaru and Th. Vilufushi, will again have a 24 hour health centre as was the case in the destroyed islands. For the population of M. Madifushi, which moved to A.Dh. Maamigili, the service improved from health post to 24 hour health centre. The population of Dh. Gemendhoo also had a health post on their island, but will have the services of a level 3 hospital on their new island of Dh. Kudahuvadhoo.

Figure 15: Reconstruction of health facilities



d) Length of coastal protection constructed/repaired

Coastal erosion has been a chronic concern of most islanders. The tsunami only underscored the seriousness of the issue. However, there is often not much that can be done on individual small islands. The vulnerability to storm tides of small islands is one of the forces driving the population consolidation programme.

The tsunami recovery strategy did not include separate provisions for the repair or reconstruction of coastal protection systems. Included with the reconstruction and repair of harbours was that of quay walls; with the preparation of the “new” islands, such as R. Dhuvaafaru and Vilufushi, specific measures for coastal protection were included, however.

e) Water – reconstruction and installation of facilities

The results of the *building back better* programme are most visible in the water sector. Potable water has been in chronic short-supply in most of the islands during the dry season. This situation was made even worse by the extended damage to water harvesting and storage systems caused by the tsunami on many of the islands. In addition, the flooding polluted the limited ground water resources, causing an acute shortage of drinking water on many islands. Immediate relief was provided in the form of bottled water, followed by the installation of RO plants and the provision of water tanks, initially mostly at the community level.

This was followed by the provision of water tanks of 2,500 litres, along with rain water harvesting facilities for individual households⁸. While rainwater harvesting facilities were built into all newly reconstructed houses, an extensive programme of repair, replacement and extension of individual rainwater systems was also embarked upon. More than 21,000 households in 101 islands have already been provided with individual tanks. Another twenty thousand households on the remaining islands are scheduled to receive them in due course.

Rainfall in the Maldives is fairly evenly spread over the year with no long dry periods and monthly levels generally between 50 and 250 mm, although dry periods can sometimes extend for more than a month. The overall level, although fluctuating substantially from year to year, is mostly in the range of one and half and two and half meters per year. In the Northern part of the country, the long-term average is about half a meter lower than in the Southern part.

Assuming a fifty square meter catchment area (measured horizontally), these levels of rainfall would give 75 to 125 m³ of water per year, enough to fill one tank 30 to 50 times. Except during an occasional long dry spell, this would ensure adequate water during the year for the average household. As communal water storage facilities continue to be in operation, these could provide a first line of defence in emergency situations.

Water harvesting systems are, of course, much cheaper to install, operate and maintain than desalination plants. Nonetheless, these RO plants also serve a purpose in the system as a source of supply in times of scarcity. As a result of the tsunami many of the water harvesting systems were damaged and the fast installation of desalination plants, generally at the time of the establishment of the temporary shelters, brought fast relief. In islands with a high population density such facilities also remain important.

Under the tsunami recovery programme, 55 desalination units have been installed and are currently operating on 35 islands, where about 40% of the island population lives. Most are of a capacity of 10 tons/day, but on a few of the islands with larger population they are much larger. At a cost of about M.Rf. 13 per 100 litres of water, desalinated water is too expensive for general use by the average household on the islands. Moreover, RO equipment is rather sophisticated and requires competent operating staff and good maintenance, both of which are scarce on the islands. In a number of islands, the new RO plants have been connected to a water supply system providing water to the houses. This did not exist on any of the islands before; even in Malé piped water supplies were introduced only in 1994.

f) Sewerage – reconstruction and installation of facilities

Before the tsunami, sewerage systems existed only on a few islands and most relied on toilets connected directly to the beach or to individual septic tanks. A few percent of the households did not have toilet facilities at all⁹. Under the tsunami recovery plan, sewerage systems are being improved, rehabilitated or installed. However, of sanitation projects on 68 islands, only 9% are now complete¹⁰ with another 28% expected to be completed in 2009 and 2010. This will improve groundwater on 25 islands for over 40,000 people. On some islands (e.g. F. Nilandoo, Dh. Meedhoo), wastewater treatment plants form part of the system while on other islands the sewage overflow¹¹ is pumped out to the sea.

Assistance provided by UNICEF, Red Cross/Red Crescent and other donors in the establishment of RO plants, water and sewerage systems went hand in hand with extensive training of local staff in the operation and management of the facilities including their financial management so that user fees can pay for the upkeep of the new facilities.

⁸The programme was started before the tsunami but enhanced and expedited afterwards.

⁹Vulnerability and Poverty Assessment II – 2004, page 89

¹⁰ At the time of writing, this included projects in R.Dhuvaafaru, K.Huraa, L.Isdhoo, Th.Guraidhoo, L.Dhanbidhoo and B.Kudarikilu,

¹¹In most cases, septic tanks are used to settle the sewerage and only the overflow goes to the sewer lines, to prevent groundwater contamination.

g) Administration – reconstruction of facilities

Repair of administrative facilities involved (not including the four completely destroyed islands) repairs to ten island offices, eight boundary walls, five roofs and three toilets. The cost of all repairs is estimated at slightly more than \$100 thousand.

In addition, substantial amounts of equipment were damaged on a total of 91 islands. The list of equipment replaced in the atoll and island offices is given in Table 14. Total cost of the equipment was estimated at about US \$200 thousand.

Table 14. Atoll/Island office rehabilitation

Equipment replaced	Number
Photo copy machines	52
Fax machines	42
CB sets	56
VHF sets	36
Computer system (including printer and UPS)	79

Source: TIAS 2005

h) Electricity / Energy – reconstruction of facilities

Electrical systems were damaged or destroyed on about one third of the inhabited islands. Damage varied from relatively small repairs to generators, distribution boxes and power lines to the complete reconstruction of the electrical system, for instance on the islands of R. Dhuvafaru and Th. Vilufushi. For the latter, electrical works were only possible after the principal infrastructure was established. For many other islands repairs were carried out in 2005 and 2006, but there was a substantial amount of work carried over to 2007 and 2008.

For the housing that is still under construction at the moment, such as on M. Kolhudufushi and L. Gan, the electric works will, of course, only be completed in parallel with the development of the infrastructure for these new housing areas.

The documentation on the reconstruction of electrical systems on the islands that has been published monthly in the progress reports has mostly been repeated from one month to the next, so that it is not possible to review the progress of the reconstruction over time. The most recent information relates to May 2007 and therefore is not conclusive on the current status of the reconstruction work. As indicated above, there are still some pockets of work outstanding, as these depend on the completion of other activities, but otherwise all electrical works have been finished by now.

Outcome indicators

The only outcome indicator in this group is the “Percentage of local administration offices fully functioning”. For the Maldives, this indicator is not very useful.

Except for the first few weeks after the tsunami, the administrative offices of all the islands were operational. Of course, for those islands that had suffered major damage, records had been lost and the system operated from temporary or damaged premises. The island offices of the islands that had been evacuated operated from those of the host islands.

5. The Tsunami Recovery – Livelihoods

Output Indicators

The following output indicators for Livelihoods are available for Maldives:

- a) Area of land returned to crops
- b) Population of tsunami-affected islands receiving loans
- c) Population of tsunami-affected islands receiving grants
- d) People employed by different sectors
- e) Damaged/destroyed boats repaired/replaced, by use
- f) People receiving fishing gear
- g) Hotel rooms available compared to before the tsunami

a) Area of land returned to crops

In 2004, the production value of agriculture was estimated at only 3% of total GDP in Maldives. The cultivation of fruits and vegetables for home use and for sale to Male' and resorts provides employment for about 5% of the total atoll population and about 8% of the women on the islands. These employment shares were similar before and after the tsunami.

Agricultural fields were reported as affected by the tsunami on nearly 25% of the islands. While on some of these islands damage to fields was severe, for one out of three, damage was limited and the fields were restored within six months of the tsunami.

About 40% of the atoll population lived on islands where many trees died as a result of the tsunami. Species commonly grown are mango, jack fruit, and guava and most species have poor resistance to salt water. Inundation by tsunami waves resulted in ground water salinity which seriously affected these trees. Once they have died, they do not recover and this therefore has a long-lasting effect on the island environment as many species take a long time to grow to such a size. Bananas in many cases also died. Native coconuts, screw pine and others did not suffer from the salinity but were still uprooted by the enormous force of the waves.

Tsunami affected farmers were provided with farming inputs of three categories: planting materials (seeds and seedlings), fertilizer (organic and inorganic) and implements (tools, machinery and equipment). A total of \$7.7m was allocated to the programme which was completed by the end of 2006.

b) Population of tsunami-affected islands receiving loans

The Bank of Maldives (BoM) had started a development banking operation in 1990 with financing provided by the International Fund for Agricultural Development (IFAD).

Following the tsunami, a number of additional funding sources became available. All these were channelled through the BoM which was the only institution with the infrastructure in place across the nation. The BoM manages the Island Livelihood Revitalization and Development Programme (ILRDP) fund. This is a revolving fund which provides loans to economic activities of the tsunami affected islands.

Table 15. ILRDP loans issued by purpose and amount

Purpose	Number	Total Loan Amount	Purpose	Number	Total Loan Amount
Agriculture	6	173,485	Photography	1	50,000
Blacksmith	2	100,000	Purchase Moto cycle	1	50,000
Boat Repair	1	50,000	Purchase Pick-Up	2	100,000
Cable TV Network	4	200,000	Renovate Masdoni	13	590,000
Car / taxi repair workshop	3	115,000	Renovate Transport Dhoni	1	50,000
Carpentry	16	727,455	Sewing	1	15,000
Computer printing	2	100,000	Tea shop	2	100,000
Construction work	4	95,000	To run pharmacy	1	50,000
Cyber café Renovate	1	15,000	Trade	46	2,160,000
Fish process	38	1,374,650	Welding	4	200,000
Goat Farming	1	50,000			
			All ILRDP loans	150	6,365,590
			Average loan size	M.Rf.	42,437

Source: Ministry of Finance and Treasury

Under the ILRDP programme, a total of 150 loans have been issued, with a total value of nearly M.Rf. 6.4m. The breakdown by purpose is shown in Table 15. The average loan size was about M.Rf. 42,500, which is about fifteen times the amount given under the grant programmes described below. The two programmes clearly address different, complementary needs.

c) Population of tsunami-affected islands receiving grants

Immediately after the tsunami, all affected households received a government cash payment of Rf. 500, Rf. 1,000, or Rf. 1,500 per person, depending on the extent of damage. This meant that an average household that lost all its possessions received about Rf. 10,000. The payments were made irrespective of the location so that also a substantial number of Male' residents that were affected by the flooding received cash compensations. There were total of 55,605 recipients under the "safety net cash grant" programme, which paid out a total of M.Rf. 50.7m, or slightly more than M.Rf. 900 per recipient.

A programme to restore lost or damaged assets of affected agricultural and fisheries enterprises, was also executed. 313 fishermen received approximately M.Rf 0.8m in grants (M.Rf. 2,550 per grant on average) and 6,149 farmers received M.Rf. 17.5m in grants (averaging M.Rf. 2,850 per farmer).

d) People employed by different sectors

As part of the tsunami relief efforts, islanders were engaged in a number of projects that brought them some income and at the same time contributed to the reconstruction of their islands, including removal of tens of thousands of tons of debris and waste.

In L. Fonadhoo, recycled blocks were made for the reconstruction of the community, for private buildings, a tsunami evacuation platform and a tsunami memorial facility. The total amount used for this activity was about \$275,000 and the works were completed by the end of 2005.

The tsunami also seriously affected the traditional fish processors in fishing communities of the atolls. Under the tsunami recovery programme, working capital grants and loans were provided to individual fish processors so that employment opportunities were restored. For the distribution and administration of the micro-credit funds, Community Based Organisations (CBOs) have been formed. The project funding amounted to about \$0.5m and 31 islands were initially selected as beneficiaries.

Nearly one thousand women, mainly in Raa, Dhaalu and Thaa atolls, benefited from livelihood restoration programmes. About two thirds of the women were engaged in sewing and home gardening, but the other third covered fifteen other activities. The programmes provided cash as well as in-kind contributions to

individual women/ households for the restoration of lost or damaged assets for women's income generation activities.

e) Damaged/destroyed boats repaired/replaced, by use

Under the programme of livelihood restoration for fishermen, 50 new long range fishing vessels were provided to 50 affected beneficiaries. In addition, 89 mechanised artisanal fishing vessels (*bokkura*) were provided to beneficiaries from 64 affected islands. The vessels and equipment started to be given out in 2005 and the programme was completed by the end of 2006. The cost of the new vessels was estimated at \$6.4m for the long range boats and \$300,000 for the bokkura.

The repair and commissioning of damaged fishing vessels, which included hull repair, engine overhaul, along with spare parts was undertaken under a separate programme. Its costs were \$1m and the work was completed by the end of 2005. Included as another component of this programme was the replacement of lost and damaged equipment on fishing vessels (including communication equipment, navigation equipment, generator sets and water pumps). This was also completed by the end of 2005 at a cost of about \$0.5m.

f) People receiving fishing gear

The replacement of lost and damaged fishing gear (including bait nets, fishing rods, lines, ropes, and bait equipment) was completed by the end of September 2008 at an overall cost of nearly \$0.5m.

The procedure for the replacement and repair of fishing vessels, equipment and gear was similar. First, the damage to all individual fishermen was assessed. The information was then consolidated and tenders were prepared for the different lots. As there were multiple donors involved, who were working in different atolls, the tendering took place mostly by groups of atolls under served by a single donor.

g) Hotel rooms available compared to before the tsunami

Some 21 resorts with nearly four thousand beds (23% of the total) were closed following the tsunami. Two-thirds of this capacity was back in service by the end of 2005. By the end of 2006, nearly all damaged resorts had reopened and the tsunami damage fully repaired. The last of the tsunami-damaged resorts was reopened in April 2009.

In order to speed up the recovery process and to generate additional economic development opportunities, many new resorts have been authorised. Although only a few of them have started operating so far, about 50% extra bed capacity will become available over the next few years, bringing the total number of beds in the Maldivian resorts to over 25,000.

Outcome indicators

The following outcome indicators relating to Livelihoods are available for Maldives:

- Percentage of population living below national poverty line
- Average household income, by gender of Head of Household
- Labour force participation rate
- Households that have regained their pre-tsunami livelihoods

The information in the following sections is not given by indicator, but in a narrative describing the developments to mid-2005. Information is available mainly for the periods end-1997, mid-2004 and mid-2005 from the nationwide surveys carried out during these three periods. In separate reports, the findings of the two Vulnerability and Poverty Assessments and the Tsunami Impact Assessment surveys have been detailed. The following gives a summary of the issues touching on the tsunami reconstruction.

A major socio-economic survey¹² had been conducted on all islands in the Maldives just six months prior to the tsunami. It was then decided to repeat the survey, with some modifications to obtain tsunami-specific information (*for instance, the psycho-social survey module*). Some of the results of the survey have already been described under the psycho-social impact of the tsunami above. The findings with respect to employment and economic well-being are described in the following sections.

No other survey has so far been conducted to evaluate the economic recovery following the tsunami. However, the economic situation as surveyed in mid-2005 was substantially better than what was seen in mid-2004. Additionally, macro-economic conditions in the Maldives remained very strong during subsequent years.

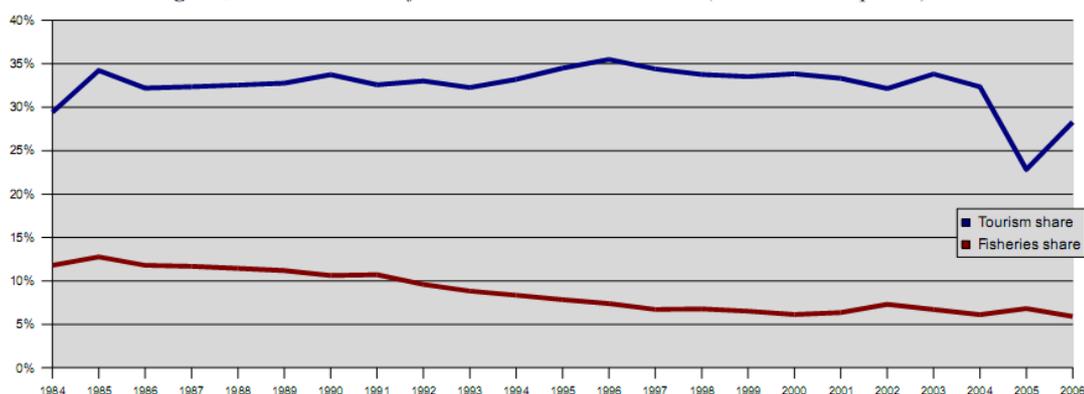
Macro-Economy

The basic components of growth were the increases in tourism and better fish catches

Tourism

In the narrow definition (that is, only hotel and restaurant services), tourism accounts for about one-third of GDP throughout this period. If other activities devoted exclusively to tourism, such as parts of manufacturing, construction, trade, transport and other services are included, this share is substantially higher at well over half of the economy. The development over time in GDP shares of the tourism and fisheries activities are given in Figure 16.

Figure 16: Tourism and Fisheries shares in GDP, 1984 – 2006



Source: Statistical yearbooks, Ministry of Finance and Treasury

At the time of the tsunami, the economy was returning to its growth path of the previous decade after a few difficult years at the beginning of the new millennium. In 2003, growth had reached more than 8% again and it was even higher at the end of 2004. Historically, tourism growth has been closely related to the exchange rate between the US Dollar (to which the Maldivian Rufiyaa is pegged) and the Euro and its precursor currencies. The large improvements in tourism numbers over the years from 2003 onwards were due to the strengthening of the Euro, a process that was not affected by the tsunami.

Tourism remains a seasonal activity with full occupancy during the peak season, which lasts more or less five months, while capacity utilisation in the low season mostly fluctuates between two-thirds and three-quarters of the total. It was peak season when the tsunami hit and due to uncertainties and damage to a substantial number of resorts, the remainder of the season was largely lost.

In June 2005, the bed capacity of the resorts, which form the mainstay of the Maldivian economy, was still more than 20% below that in the two previous years. Tourism bed-nights were only running at half the rate of the previous year and this had serious knock-on effects throughout. While resorts did not reduce employment to the same extent, the income of the workers was cut significantly as service charges and tips make up a substantial proportion of the salaries under normal conditions.

¹² *The Vulnerability and Poverty Assessment II – 2004*

However, by the end of 2006, occupancy rates were back to the pre-tsunami levels and in 2007 and 2008 new records in both the number of tourism arrivals as well as the number of tourism bed-nights were established.

Fisheries

The loss of equipment for traditional fish processing, a major activity on the islands, resulted in reduced output. However, fish catches were very high in 2005. They were the highest on record and about 30% higher than the average for the previous five years. The capacity of the industrial operations, mainly MIFCO, was stretched to the limit and at times, not all fish landed could be processed, leading consequently to waste.

The increases in fish landings were due entirely to higher catches per trip, as the number of fishing trips was about 10% lower in 2005 than the preceding year.

In 2006, fish catches were at the same level as those in 2005 but they returned to the long-term average levels in subsequent years.

Other sectors

The relocation of the population from the four most affected islands to the ten host islands resulted in major increases in economic activity on those islands, with incomes for the original population up by about one third. The incomes of the externally displaced persons, which had been reduced significantly immediately following the tsunami, was back up to about 80% of their pre-tsunami levels by the middle of 2005. The knock-on effects of the disaster through reduced trade and disturbances in the property markets made incomes in Male' fall by about 10%. In the other areas of the country, covering most of the atoll population, incomes had gone up. As this description reflects the developments in the average socio-economic conditions of the households in each of these groups, individual experiences may, of course, be far less rosy than given here.

The repair and reconstruction activities started after the tsunami created additional job opportunities in construction and transport, which compensated partially for the losses in other sectors. As an indicator of the construction sector, the value of building materials imported has risen sharply over the past few years. In constant 2003 prices, construction material imports averaged about Rf. 700 million annually up to 2003. They then rose sharply due to the development of additional resorts and demand for tsunami reconstruction to a total of Rf.2.9 billion in 2007, an average increase of about 42% per year.

A major salary increase of government employees that was granted a few months before the tsunami also provided an additional financial cushion for a substantial part of the population. The extensive support received from the international community, local donors and the government helped the affected households to re-establish themselves.

The large increase in government wages in August 2004 had also given a boost to consumption and consequently, the trade sector. The economic recovery from the tsunami-induced effects was much faster than initially expected, both at the macro-economic and household levels. Many of the resorts that had been closed initially were back in business again by the middle of the year, when tourist flows also started to return to more normal levels. The extra activity generated in the aftermath of the floods, including the relocation of residents and provision of accommodation for them, the refurbishing of damaged resorts and infrastructure on many islands and many other activities initiated by the disaster created additional economic growth for the sectors construction and transport.

The complex mix of positive and negative economic factors, of which the most important ones have been mentioned above, resulted in an economic development that was, on average, positive in economic terms. Household incomes were found to be about 7% higher in June 2005 than they were in September of the previous year.

It may be noted that some of the impacts described above are short-term in nature while others have longer-term implications. For instance, the positive effects on the population of the host islands will largely be reversed when the displaced people are resettled in their permanent locations. Improvements in infrastructure brought about by the rebuilding after the tsunami will generally have longer-term effects. Of course, the government finances and the external account came under pressure as government and export revenues shrank due to the reduction in tourism activity. At the same time, emergency aid and reconstruction efforts increased government expenditures along with imports. These two developments

resulted in sharp increases in deficits of both the budget and the current account, even though the major part of the tsunami relief assistance was received in the form of grants. Nonetheless, thanks to continuing strong economic growth, the government's foreign debt remains in relative terms well levels of the early 1990s and foreign debt as percentage of export earnings is projected to remain well below 10%.

Population below poverty line

Poverty has actually gone down significantly since June 2004. At that time, 34% of the island population had an income lower than Rf. 15 per day. One year later, only about 20% of the island population had such a low income. The development of poverty, in terms of the headcount ratios at different poverty lines, is given in Table 16.

Table 16. Headcount ratios according to various poverty lines

Poverty line	Atolls			PDE			PDI			Host islands		
	1997	2004	2005	1997	2004	2005	1997	2004	2005	1997	2004	2005
Rf. 7.5	25%	13%	8%	15%	*	9%	18%	13%	10%	20%	15%	*
Rf. 10	31%	20%	11%	21%	*	13%	29%	20%	14%	28%	19%	*
Rf. 15	48%	34%	20%	39%	25%	25%	40%	34%	21%	47%	32%	9%
Rf. 21	64%	50%	32%	60%	47%	36%	61%	50%	31%	69%	46%	20%

*) too few observation to be statistically reliable

Source: VPA-1, VPA-2, TIAS

Information is given for the atolls, and for the three specific displacement groups of tsunami IDPs: PDEs (Population displaced externally--IDPs living on other islands), PDIs (IDPs living on their own island) and the Host islands (the original population of the islands where the PDEs are living temporarily). In addition to the three specific groups of islands given in the table, which account for 10% of the total population of the Maldives, the details for the other islands, with 60% of the total population are not given separately as the effects of the tsunami on their development were minimal.

MDG Indicators such as life expectancy and literacy rates, which reflect long-term investment in health and education, have not been significantly affected. The population from the most affected islands actually perceived that education and health facilities had improved after the tsunami. For the displaced population this is the direct result of their moving to islands that had better facilities already or where those were upgraded as a result of the increased population.

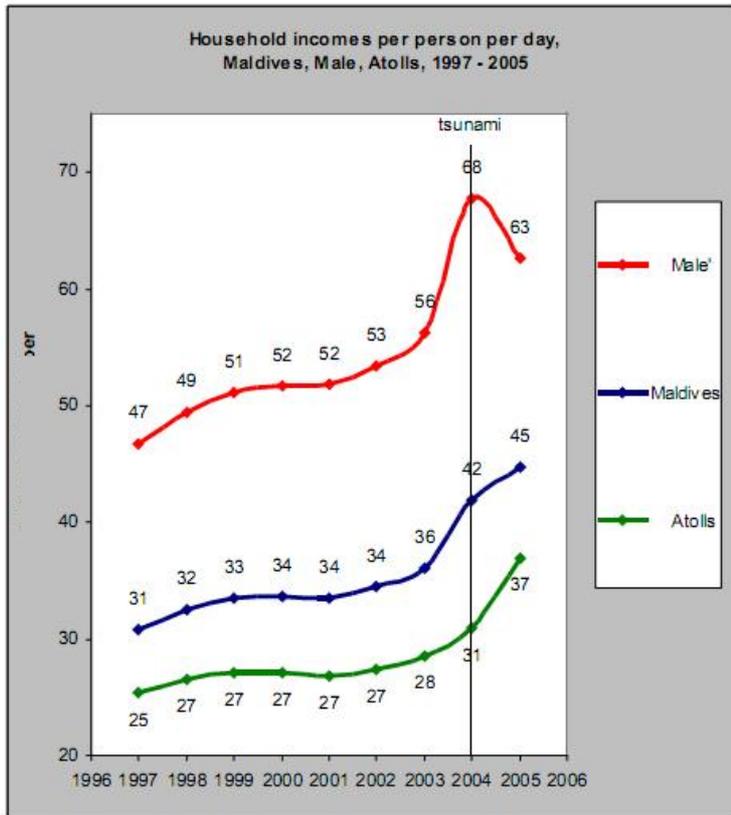
The panel studies¹³ showed that the socio-economic situation of the panel households had greatly improved during the period 1997 to 2005. Nonetheless, it became clear that their vulnerability was much greater than these broad improvements suggest. Using the Rf.15 poverty line, 21% of the island population had managed to escape poverty between 2004 and 2005. However, 7% of the population fell back into poverty during the same period resulting in a net gain of 14%.

Six months after the tsunami average household incomes¹⁴ were even higher than before. The rapid development in the Maldives during the past 25 years continued after the tsunami. The development of per capita household incomes in Maldives, Male' and the Atolls over the period from 1997 to 2005 is shown in Figure 17.

¹³ Half the households in VPA-1 were again included in VPA-2 and about half of those again in the TIAS. This provided the panel for the study covering an eight year period.

¹⁴ For the affected population this also included the free food and cash provided by the government in the aftermath of the tsunami. Food subsidies for tsunami victims still continue.

Figure 17: Mean household incomes (Rufiya per person per day) 1997 – 2005



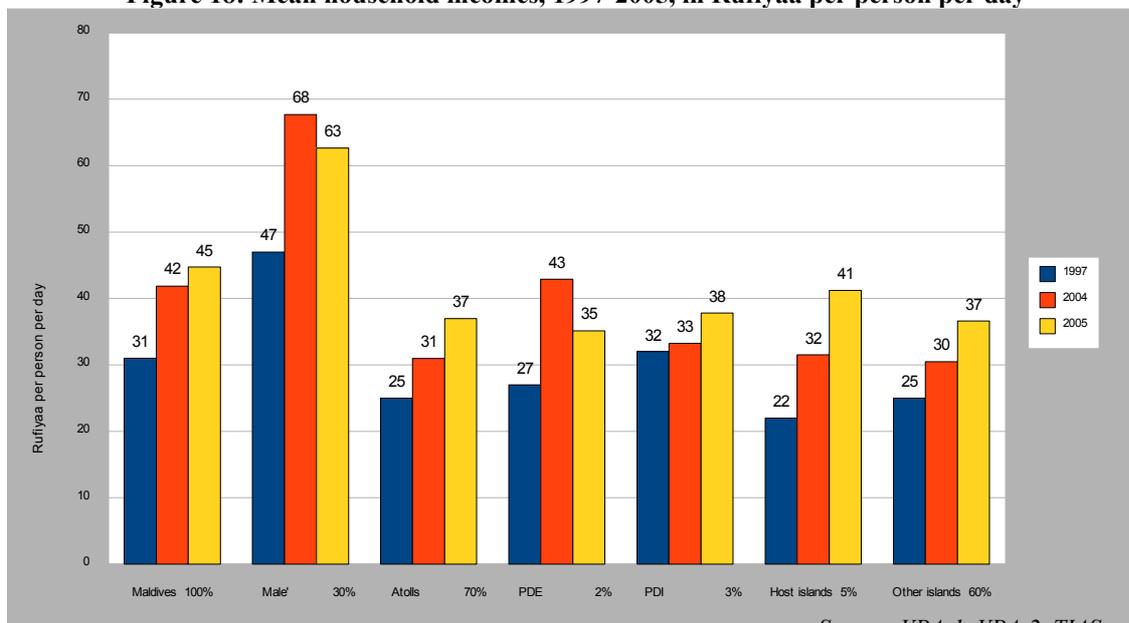
Source: VPA-1, VPA-2, TIAS database, Statistical Yearbook 2005

It is based on three observations: VPA-1 in 1997, VPA-2 in 2004 and TIAS in 2005. Estimates of the years between 1997 and 2004 are derived from the per capita GDP growth rate from the two VPA observations, 1997 and 2004.

It may seem surprising that the mean incomes of the island population continued to grow after the tsunami whereas household incomes in Male', which was only slightly damaged by the tsunami, declined by about 10%.

Figure 18 further disaggregates this picture, providing the mean income for Malé, the atolls and the four displacement groups of islands described above. Only for the population of Malé and the PDEs did the mean household income go down between 2004 and 2005. For all other groups of islands did the mean increase.

Figure 18: Mean household incomes, 1997-2005, in Rufiyaa per person per day

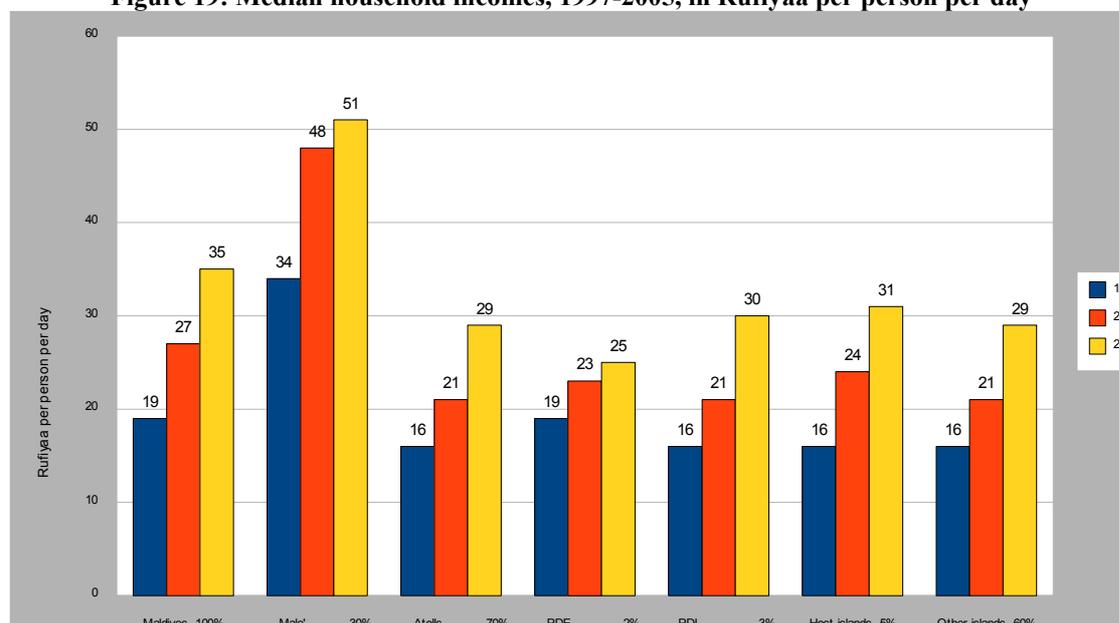


Source: VPA-1, VPA-2, TIAS

Figure 19 shows that the *median* per capita household income, that is, the income level at which half the population has a higher income and the other half a lower one, has increased for all island groups.

As the median income has increased for all displacement groups, while the mean per capita household income declined in Male' and the PDEs (Figure 18), this means that the loss of income in those two areas must have been concentrated in the richer half of the population.

Figure 19: Median household incomes, 1997-2005, in Rufiyaa per person per day



Source: VPA-1, VPA-2, TIAS

Expatriate labour

In parallel, the influx of expatriate labour continues at a high rate. There were fewer than 40,000 expatriate labourers in the country at the end of 2004; one quarter of them employed in construction and another quarter in the resorts with the other half working in more than twenty other sectors. At the end of 2008, there were twice as many expatriates with nearly half (34,000) of them construction workers. The number of resort workers increased by about four to thirteen thousand.

The major change was, however, in the number of workers in the sector “other community and social workers and personal services”, which mainly consists of domestic workers. Their number increased from less than three thousand in 2004 to more than ten thousand at the end of 2008. This shows that the Malé population not only can continue the costs of employing domestics, but that it seems to have become a much more widespread practice over the past four years since the tsunami.

The vast majority of expatriate workers in Maldives, some 70 to 80%, are unskilled or semi-skilled and earn wages at par with their counterparts in their countries of origin. Most of these workers come from Bangladesh, India and Sri Lanka, where the cost of living¹⁵ is substantially lower than that in the Maldives and especially Malé. As low-skilled expatriate workers mostly live in labour camps, these cost of living differences are not important for them, but it is not possible for Maldivians to work for the same wages in Malé and then afford a place to live. In addition, most Maldivian youth have had a fair amount of education (always to elementary, but many also to secondary level) and they are not very interested in manual jobs, certainly not if the pay is poor.

¹⁵ The recent round of the International Comparison Project calculated the prices of household consumption in the Maldives at roughly double those in the Indian sub-continent. The fact that nearly all products in Maldives are imported and the scarcity of land in Malé that inflates rents are the main reasons for these large differences.

6. Other indicators

a) Security and disaster preparedness

A natural disaster of the scale of the tsunami had not occurred in the Maldives before. The worst situations before had been limited flooding due to heavy rainfall and small tidal surges, a few outbreaks of contagious diseases plus the occasional boating or small aircraft incident. But these had all been localised incidents and existing administrative procedures could easily handle them. The tsunami was of a completely different magnitude and nothing short of a similarly devastating event could have adequately prepared the nation.

In the immediate aftermath of the tsunami, the Government developed responses on the go. Once the magnitude of the devastation became clear and offers of support started to flow in from across the world, the Government quickly grasped the opportunities and agencies specialised in the various aspects of disaster relief, assessment and management established a presence to assist the Government in its relief efforts. Major donors and Government prepared a Joint Needs Assessment and an attendant report that was released in Feb 2005.

Several activities have been undertaken during the past years to strengthen the disaster-response capacities of the population. The National Disaster Management Centre is reorganizing itself. It will expand, continuing as an institute to improve standards and to provide training in various aspects of disaster management at national level as well as the local, island level.

The IFRC has developed first aid standards for the country and set up the First Aid Practitioners Network. Island disaster management guidelines were prepared; island disaster management committees (IDMC) were established and properly stocked emergency first aid kits were distributed to IDMCs on islands in several atolls. Teachers and community volunteers were also trained in community-based first aid on various atolls.

b) Environment

Solid waste management was another weakness in the environmental situation on the islands. Until fairly recently, the economic conditions on the islands were such that few modern goods were available and therefore little non-degradable waste was generated on the islands. Fifteen years ago¹⁶, on most islands there were no cars or motor cycles and electricity supply was very limited if available at all. Packaged food supplies were also not common and many islands had only very few shops as little cash was circulating on the islands. Most modern goods were sent from Malé by relatives.

Only during the past two decades with the fast rising incomes did the problem of solid waste really develop. The tsunami exacerbated the problem manifold as on many islands the entire contents of houses, shops, offices and other structures, along with much of the structures themselves, ended up as solid waste. A comprehensive clean-up programme was initiated after the tsunami with support of the Australian and Canadian Red Cross. Some 37,000 cubic metres of debris and waste was removed from 74 islands. A sustainable waste management programme was developed with more than 1,300 community workers and two thousand students trained.

¹⁶ Maldives was about to graduate from LDC status when the tsunami struck. Over the past 25 years, per capita GDP increased nearly four-fold.

7. Conclusion

In the four years since the tsunami, much has been accomplished to provide its survivors first with basic needs and then with the resources to restart their lives. Most of the physical infrastructure will be finished in 2009 and tsunami resources have enabled notable improvements in basic services, particularly health and education. The challenging housing sector was brought under control and most of the remaining work will be completed in the year as well. Large-scale disruptions to livelihoods and the economy were mitigated. Lasting improvements made in disaster risk reduction policies, institutions and systems will increase resilience to future crises.

However, a number of problems caused or worsened by the tsunami have not yet been resolved and remain priorities for government and its partners: The vital needs of water and sanitation and reconstruction of remaining infrastructure for harbours and jetties remain the most pressing of unfinished priorities highlighted in the analysis.

Additionally, the complexities of relocating entire island populations and resettling remaining displaced persons (IDPs) will require careful attention in their completion and the management of beneficiary expectations to avoid programmes these remaining unfinished.

It is inevitable that some of these processes will lag into 2010 while currently unfunded sanitation and harbour infrastructure projects will need to extend even further into the future.

Evidence-based management of the tsunami recovery, like other development plans, entails regular collection of summary data, systematically provided to a government authority that can review across sectors. To date the compilation of a limited set of multisectoral data has proved a challenge and improved arrangements are still necessary to make the sharing of specific data faster and more regular.

Additionally, proof of the outcomes of the recovery effort generally requires surveys, and there has been an absence of survey activity since 2005/6. A follow-up survey is therefore recommended, along the lines of the 2005 TIAS survey, both for ease of analysis and increased value of the results. In Maldives, modern communication technology makes possible low cost alternatives to logistically complex and expensive household surveys.

Appendix A. TRIAMS

Under the auspices of the International Federation of Red Cross and Red Crescent Societies (IFRC) and the World Health Organisation (WHO) a reporting system was developed for recording the recovery process in the four most-affected countries. This Tsunami Recovery Impact Assessment and Monitoring System (TRIAMS) was also implemented in the Maldives.

TRIAMS groups all indicators under four topics, which are: (a) vital needs; (b) basic services; (c) infrastructure and (d) livelihoods. Under each topic, there are two types of indicators, namely output indicators and outcome indicators. The distribution of the 49 TRIAMS indicators over the eight categories listed above is as given in Table A.1 below.

Four of these indicators are not required or not applicable in the Maldives, largely due to its geography as a country only made up of small islands. Some other indicators are static and therefore do not change over time, which makes them not very useful for monitoring.

Table A.1. TRIAMS indicators for Maldives by topic and type

Type of indicator	Total	Monitoring	Evaluation	Not required / not applicable
1 Vital Needs OUTPUT Indicators	7	4	3	1
2 Vital Needs OUTCOME Indicators	9	4	4	0
3 Basic Services OUTPUT Indicators	11	7	1	2
4 Basic Services OUTCOME Indicators	3	3	0	0
5 Infrastructure OUTPUT Indicators	5	8	0	0
6 Infrastructure OUTCOME Indicators	1	0	0	1
7 Livelihoods OUTPUT Indicators	9	5	1	0
8 Livelihoods OUTCOME Indicators	4	0	4	0
Total	49	31	13	4

In the table above, the indicators have been sub-divided into two groups, namely those that are used for monitoring and others that can only be used for evaluation as they are available only once or twice over the reconstruction period, but not on a regular basis.

Appendix B. Annexes

A. Acronyms

ADB	Asian Development Bank
ARC	American Red Cross
AuRC	Australian Red Cross
BOM	Bank of Maldives Plc
BRC	British Red Cross
CBO	Community Based Organisation
CRC	Canadian Red Cross
DAD	Development Assistance Database
EIB	European Investment Bank
EU	European Union
FAO	Food and Agriculture Organisation
FRC	French Red Cross
GDP	Gross Domestic Product
GoM	Government of Maldives
GRC	German Red Cross
HIRU	Housing and Infrastructure Redevelopment Unit
IDMC	Island Disaster Management Committee
IDP	Internally Displaced Person
IFAD	International Fund for Agricultural Development
IFRC	International Federation of Red Cross and Red Crescent Societies
ILRDP	Island Livelihood Revitalization and Development Programme
IMR	Infant Mortality Rate (number of infant deaths per 1,000 live births)
IYCF	Infant and Young Children Feeding practices
JICA	Japan International Cooperation Agency
KAP	Knowledge, Attitudes, Practices
LDC	Least Developed Country
MATI	Maldives Association of Travel Industry
MDG	Millennium Development Goals
MCPI	Ministry of Construction and Public Infrastructure
MEEW	Ministry of Environment, Energy & Water
MICS	Multiple Indicator Cluster Survey
MIFCO	Maldives Industrial Fisheries Company Ltd
MMR	Maternal Mortality Rate (Number of maternal deaths per 100,000 births)
MNCC	Maldives National Chamber of Commerce and Industry
NDMC	National Disaster Management Centre
NGO	Non-Governmental Organisation
NRRP	National Recovery and Reconstruction Plan
OCHA	UN Office for the Coordination of the Humanitarian Affairs
OXFAM	OXFAM International
PDE	IDPs living on host islands

PDCP	Population Development and Consolidation Programme
PDI	IDPs living in temporary shelter on their own islands
RO	Reverse Osmosis (desalination)
SHE	Society for Health Education
TIAS	Tsunami Impact Assessment Survey
TRIAMS	Tsunami Recovery Impact Assessment and Monitoring System
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFPA	United Nations Population Fund
UN-HABITAT	United Nations Human Settlements Programme
UNICEF	United Nations Children's Fund
USAID	US Agency for International Development
VRS	Vital Registration System
WB	World Bank
WHO	World Health Organisation

B. List of international tsunami recovery and development partners

Red Cross and Red Crescent Societies:

American Red Cross
Australian Red Cross
British Red Cross
Canadian Red Cross
French Red Cross
German Red Cross
Hong Kong Red Cross
International Federation (IFRC)
Saudi Red Crescent
U.A.E. Red Crescent

UN Agencies:

FAO
OCHA
UN
UN Foundation
UN Habitat
UNDP
UNFPA
UNICEF
WHO
World Food Programme

Other partners:

Asian Development Bank
Australia
Belgium
Canada
China
ECHO, European Commission
European Commission
Finland
Flinders Council, Tasmania, Australia
France
Germany
Greece
Japan
Korea (Republic of)
Kuwait
Luxembourg
Mauritania
NIO Bank, Netherlands
Netherlands
New Zealand
Norway
Portugal
RaboBank, Netherlands
Rotary International
Switzerland
Trinidad and Tobago
Tuvalu
United Kingdom
United States of America
World Bank

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Seventh National Development Plan – Republic of Maldives.

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Tsunami Impact Assessment Survey (TIAS), 2005, Ministry of Planning and National Development in co-operation with the United Nations Development Programme and the United Nations Population Fund, Malé, Republic of Maldives, September 2006.

Tsunami Recovery and Reconstruction Progress Update, monthly from June 2005 to November 2008.

United Nations Maldives, Summary of Activities, Recovery Programme, June 2006.

Vulnerability and Poverty Assessment (VPA-I), Ministry of Planning and National Development in co-operation with the United Nations Development Programme, Malé, Republic of Maldives, 1998.

Vulnerability and Poverty Assessment II (VPA-II), 2004, Ministry of Planning and National Development in co-operation with the United Nations Development Programme, Malé, Republic of Maldives, 2005.

D. Related websites

Tsunami Recovery and Reconstruction Programme, Progress updates
<http://www.tsunamimaldives.mv/>

National Recovery and Reconstruction Plan,
<http://www.tsunamimaldives.mv/text/downloads/nrrp.htm>

Department of Information, Ministry of Tourism, Arts and Culture
<http://www.maldivesinfo.gov.mv/>

Ministry of Health,
<http://www.health.gov.mv>

Department of National Planning, Ministry of Finance and Treasury
<http://www.planning.gov.mv>

The President's Office, Republic of Maldives,
<http://www.presidencymaldives.gov.mv>

Ministry of Tourism, Arts and Culture
<http://www.maldivestourism.gov.mv>

Ministry of Housing, Transport and Environment
<http://www.meew.gov.mv/>

Ministry of Education,
<http://www.moe.gov.mv>

Ministry of Finance and Treasury,
<http://www.finance.gov.mv/>

Ministry of Fisheries and Agriculture
<http://fishagri.org/>