

PROTECTING CHILDREN FROM UNSAFE WATER IN GAZA STRATEGY, ACTION PLAN AND PROJECT RESOURCES



SUMMARY DOCUMENTS

MACRH 2011

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PROTECTING CHILDREN FROM UNSAFE WATER IN GAZA STRATEGY, ACTION PLAN AND PROJECT RESOURCES*

For an inter-sectoral, multidisciplinary approach, global/ oPt/Gaza research findings and data, technical information; MDGs; international guidelines and national development framework regarding; water quality, quantity, mapping and monitoring; sanitation and hygiene; desalination and reverse osmosis; environmental degradation and climate change adaptation; water storage practices and monitoring of vended water; public health – water- and food-borne diseases; associated micronutrient deficiencies (“hidden hunger”) and growth deficits; nutritional supplementation and exclusive breastfeeding; and social and behavioural change communication (C4D).

UNICEF- occupied Palestinian territory

March 2011

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ACRONYMS

BOD	Biological oxygen demand
BMS	Breast milk substitutes
CAP	Consolidated appeals process
C4D	Communication for development
C4DWG	Communication for development working group
CHW	Community health worker
CMWU	Coastal Municipal Water Utility
ERRP	Early recovery and reconstruction plan
GDP	Gross domestic product
GIS	Geographical Information Systems
HCT	Humanitarian Country team
HWWC	Health, hygiene and hand washing with soap
INGOS	International non-governmental organizations
IMCI	Integrated management of childhood illnesses
IMR	Infant mortality rate
KBAP	Knowledge, behaviours, attitudes and practices
MDG	Millennium Development Goals
M&E	Monitoring and evaluation
MoEHE	Ministry of Education and Higher Education
MoH	Ministry of Health
NBFC	National Breast Feeding Committee
MTRP	Medium term response plan
NGO	Non-governmental organizations
oPt	occupied Palestinian territory
ORS	Oral rehydration salt
PNGOs	Palestinian non-governmental organisations
RO	Reverse osmosis
VHW	Village health workers
PCBS	Palestinian Central Bureau of Statistics
PHC	Primary Health Care
PHG	Palestinian Hydrology Group
PWA	Palestinian Water Authority
TIP	Trials of improved practices
TF	Task force
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
WHO	World Health Organisation
WFP	World Food Programme
WASH	Water, Sanitation and Hygiene

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Executive Summary

This Strategy and Action Plan was requested by a Task Force (TF) appointed by the occupied Palestinian territory (oPt) Humanitarian Country Team (HCT), under the assigned theme, 'Protecting children from unsafe water in Gaza'. UNICEF engaged and supervised the consultant to develop the response strategy and action plan. Additional summary documents are the (a) Summary of recommended actions; and (b) Quick-start project lists.

1.0 Background

This report was commissioned following the publication in 2009 of the UNEP environmental assessment of Gaza.ⁱ The report paints a panorama of environmental degradation in Gaza. Of particular concern to the HCT, it documents an alarming situation of dangerously contaminated water and a heavily polluted, toxic environment, with consequent threats to infants and children.

The UNEP report's salient contribution was to highlight for the humanitarian and wider aid community the extent to which environmental degradation – masked by periodic military destruction of essential infrastructure in Gaza and consequent serial humanitarian emergencies – is creating immediate threats to human health. These have been expressed and addressed as humanitarian needs rather than reframed as nascent (eco) system collapse, with multiple causes and particular accelerants, including military destruction.

In highlighting the extent to which the fast-degrading environment threatens human habitation in the Gaza Strip, the report's findings suggest the contours of the road map to that eventuality if concerted action is not undertaken. Situated in a higher-level planning framework, such action will be based on reframed problem analysis and joint programming to address comprehensively the dangers to children, who are most vulnerable. Equally, it will require renewed high-level commitment to remove the Israeli blockade of Gaza and put an end to the military depredations, the two primary obstacles to obtaining funds for large-scale mitigating measures.

The HCT, in calling for an inter-agency response to protect children in Gaza from unsafe water, implicitly endorsed a joint programming model. This Strategy and Action Plan were developed accordingly, reflecting the HCT's directive as well as good practice underpinned by global guidance and research. Referenced in guidance sub-sections throughout the Action Plan, these indicate that water contamination and sanitation crises, with their associated effects on child health status, require an inter-sectoral as well as inter-agency planned approach to achieve successful results. Mechanisms for joint programming and funding are suggested in the Strategy and project responses listed in the Action Plan.

The Action Plan is intended to be situated within two planning frameworks: the Palestinian Authority's (PA) current plan to achieve its Millennium Development Goals by 2015 (MDGs 1, 4 and 7), to be nested in a larger plan, in development by the PA and partners, to mitigate environmental deterioration and promote an adaptation strategy for climate change.ⁱⁱ Implementation of the Action Plan would –

- a. improve access to **safe and adequate water and sanitation** and promote and support **adapted hygiene practices**, and
- b. improve **child health indicators** associated with (chemically and microbiologically) unsafe water and a contaminated environment.



Figure 1: Map of the Gaza Stripⁱⁱⁱ

2.0 Intertwined crises

The Gaza Strip has been a theatre of conflict for decades. Each of these conflicts has left its mark, and over time, a significant environmental footprint has developed in the Gaza Strip.^{iv}

The long-standing and accelerating environmental crisis in the Gaza Strip described by present-day institutional actors^v was initiated by a massive influx of refugees in connection with the forced migration of the late 1940s. Since 1967, environmental pressures have been accelerated by Israeli occupation and presence until 2005 of water-intensive Israeli settlements, ongoing serial military depredations, continuance of the three-year economic blockade and violent containment of a fast-growing population on a small tract of land, just 365 km². The human rights and protection crisis – punctuated by periodic highly destructive military offensives – interacts with and compounds environmental pressure.

Although climate change effects on the Gaza environment are judged by experts to be still less significant than the effects of Israeli actions and restrictions, they are nonetheless already a factor in present-day environmental deterioration. Climate change that contributes to environmental crisis is no longer looming, say these experts, but has arrived, "clear and present".

The real physical scarcity of natural resources in the Gaza Strip is thus compounded by scarcity induced by conflict. The effects [of climate vulnerability] are felt... in terms of collapsed livelihoods and contaminated ground water... and much worse direct effects on public health. Farmers squeeze a living from ever decreasing yields, gastro-intestinal disease and malnutrition rates increase and the community fabric is worn through in ways that are beyond the scope of this study to investigate.^{vi}

Whilst coping and adapting at the household and community level are not a substitute for urgent and effective action on climate change at the recommended national, regional and global levels, these experts judge it critical to address water scarcity and quality and public health outcomes in Gaza now: "National government institutions should serve to create the conditions by which communities and individuals can improve their capacity to cope with climate stresses and hazards".^{vii}

Crises synergy compromises Gaza children's present and the future of its living and liveable space. Expert consensus and research findings indicate that the compounded effects of the crises are manifest today. Insufficient and contaminated water, poor sanitation and maladaptive hygiene practices have sequelae and ultimate outcomes that are known to damage the cognitive and physical development of children and increase child morbidity and mortality rates.^{viii} They compromise children's life chances and undermine present and future generations' ability to check dystopic trends.^{ix}

Tackling water insecurity successfully is a necessity if Gaza is to remain habitable. Continuing to meet the basic water needs of Gaza's fast-growing population is not commensurate with sustainability of the fast-depleting, highly contaminated aquifer and equally fast-degrading environment. High-level advocacy to remove the central obstacle to action is crucial and urgent. Cooperating actors must ensure that short-term action to address compounded outcomes is undertaken in the framework of broader development efforts and environmental planning that incorporates a climate change adaptation strategy.

It will require concerted efforts and adequate funding of actors in the protection, humanitarian aid, development and environment fields, all working within the PA planning and results framework. Success will depend upon effective coordination of an inter-agency, inter-sectoral joint effort on multiple levels. Joint action is necessarily underpinned by a common analysis reached through the application of multi-disciplinary knowledge, data and technical capacity. The ability of the population to cope in a high stakes, high risk environment must be sustained over time through relevant policy development and effective execution and social and behavioural change at multiple levels of Gaza society.

3.0 Population

Conflict and forced migration are at the root of the environmental and human rights and protection crises in the Gaza Strip today. In connection with the 1948 war, Gaza, then a sub-district of 80-85,000 people inhabiting a sliver of coastland, within just a few years became home to some 200-250,000 refugees, a population increase of about 300 per cent.^x The effects on the society, economy and politics as well as the environment were profound and intensified after the 1967 Israeli occupation, as the result of periodic massively destructive military operations and the near full blockade of the Strip since June 2007.

The Gaza Strip in 2010 has a population of some 1.54 million persons, the sixth highest population density in the world, a high fertility rate and a fast-rising population. It has a very young demographic -- a rapidly growing youth segment, children under 18 years forming over half (estimated 52 per cent) of Gaza's inhabitants, and infants and children under five years comprising 16 per cent of the population^{xi}.

Of particular concern to this initiative to protect children from unsafe water is the estimated 251,829 (16 per cent) Gaza infants and young children under five years^{xii}, and are most vulnerable to the effects of water-associated diseases.

4.0 Needs analysis: Unsafe water and child outcomes

A particular threat to children in Gaza from unsafe water and associated effects on children has been identified. Significant regional disparities in child outcomes between the West Bank and Gaza Strip, arising in part from unsafe water and its associated effects, make attainment of relevant MDGs unlikely without focused action in Gaza.

4.1 Unsafe water in Gaza a particular threat to children

The multiple needs associated with child exposure to unsafe water are revealed by following the water contamination cycle from source through distribution, handling and storage, to consumption and resulting child health outcomes. They are addressed by the Action Plan insofar as they fall within the scope of the assigned theme, 'Protecting children from unsafe water'. Related details can be found in the 'Endnotes--Project Resources'.

- a. Gaza's sole water source, the **aquifer, is chemically contaminated** with dangerous levels of chlorides, nitrates and other pollutants, some far in excess of WHO guideline values, the result of long-standing water-security, sanitation and environmental crises arising from multiple inter-linked causes.^{xiii}
- b. **Microbiological water contamination** (including faecal coliforms and faecal streptococcus) is pervasive, increasing at each point in the water handling cycle,^{xiv} and is

- responsible for significant diarrhoeal and other water-associated disease in Gaza's infants and children under five (as well as older children and the general population).^{xv}
- c. Increasing (safe) **water scarcity exacerbates the water safety problem**, further endangering the viability of the Gaza Strip.^{xvi}
 - d. Perceptions and realities of water crisis in Gaza: (a) *Water is an "urgent need" for 30 per cent of Gazans surveyed (and for 43 per cent of Middle Gaza households and 48.6 per cent of Gaza governorate households);^{xvii} water is insufficient for 36.1 per cent of Gazans surveyed (and for 46.3 per cent of Rafah households and 43.7 per cent in Middle Gaza);^{xviii} nearly two thirds (63.8 per cent) of Gazans consider their water to be of "bad quality" because of the high salinity and water pollution from wastewater contamination.*^{xix}
 - e. The *sewage network* covers two thirds (66.7 per cent) of Gaza's population but is destroyed or in disrepair; wastewater treatment plants are overloaded, working far beyond design capacity and unable to function due to lack of fuel; 60 MLD of untreated or partially treated sewage is disposed of in the sea; wastewater lagoons have breached, causing sewage to flood nearby communities and kill residents, contaminate the land and percolate into the aquifer.^{xx}
 - f. The remaining third (33.3 per cent) of the population, representing about a half million people whose homes are **not connected to the network, use cesspits and open channel flows**, adding to environmental contamination, aquifer pollution and public health threats.^{xxi}
 - g. Sewage contamination of the aquifer is a **major cause of nitrate contamination** that represents a potential threat to infants and pregnant women.^{xxii}
 - h. Without significant regional variation, residents of Gaza and the West Bank, including East Jerusalem say the **three most important environmental problems** facing Palestinian society are: (1) pollution (41 per cent), (2) accumulation of waste in public and residential areas (24 per cent), and (3) corrosion and collapse of the sewage system (14 per cent). Among the "**most concerning**" health hazards, environmental issues are the major concerns: pollution (31 per cent) and unclean water (21 per cent) are the two most important perceived health hazards in the oPt. With sewage the major health hazard for seven per cent, **environmental problems are the "most concerning" health hazards for 59 per cent** of Palestinians.^{xxiii}
 - i. **Over a quarter (28 per cent) of Gazans report feeling insecure about present and future availability of clean water**, higher than in the West Bank (18 per cent); with residents of refugee camps (25 per cent) and cities (24 per cent) throughout the oPt feeling more insecure than villagers (16 per cent).^{xxiv}
 - j. **90-95 per cent of water in Gaza is too contaminated to drink** say UN agencies, The World Bank and the Coastal Municipal Water Utility (CMWU); "only five per cent – 10 per cent of the aquifer is suitable for human consumption and ... this supply could run out over the next five to 10 years without improved controls."^{xxv}
 - k. Water, sanitation and hygiene are among the **top humanitarian priorities** in Gaza listed by OCHA and the Gaza Minister of Health in August 2010;^{xxvi} and water quality and sanitation network coverage are considered **key vulnerability indicators** for project targeting in Gaza.^{xxvii}
 - l. Inadequate water and sanitation facilities in Gaza schools are obstructing **access to education**, particularly for girls.^{xxviii}
 - m. **Infants and young children are especially physically vulnerable** to the immediate effects of microbiological contamination (diarrhoea, vomiting and dehydration);^{xxix} moreover, along with pregnant women, they are also most vulnerable to the initially silent effect of chemical contamination, such as by nitrates.^{xxx}

- n. **Over two thirds (68.4 per cent) of households use chemically contaminated water for cooking**, the heat further concentrating nitrates and other chemicals.^{xxx}
- o. The **potential for nitrate poisoning of infants** under six months (“Blue Baby Syndrome”), of repeatedly expressed concern by institutional actors in the oPt,^{xxxii} has not been the subject of medical research.^{xxxiii}
- p. **Water supply capacity does not correspond with guidelines on basic human needs.**^{xxxiv} An indicator of low per capita water consumption is the highly concentrated sewage in the Gaza Strip, “with typical influent levels of biological oxygen demand (BOD) of up to 600 mg/litre as compared to 250 mg/litre, which is standard for urban sewage.”^{xxxv}
- q. The **average water consumption level in Gaza** corresponds to or in places exceeds one or two elements of WHO’s category of intermediate access^{xxxvi} (“service level about 50 lpcd” and “access measure” an on-plot tap) but these do not add up to “needs met”/“consumption assured” and the corollary of “low health concern” due to the **high level of chemical and microbiological contamination, which makes Gaza’s water situation more complex than indicated by water quantity.**
- r. Average per capita water consumption (personal and domestic) in Gaza (80-90 lpcd) conceals the **disparity in access to water**, with some communities consuming as little as 2.6 lpcd, and highlights the need for mapping and prioritized response.^{xxxvii}
- s. In addition to contaminated water, **inadequate water for hygiene purposes** is known to be a significant cause of diarrhoea in children under five.^{xxxviii}
- t. **Public network water is (chemically and microbiologically) contaminated** from source and in distribution and storage.^{xxxix}
- u. **Access to education, particularly for girls, is obstructed by inadequate water and sanitation:** many school sanitary facilities do not meet minimum education standards and can not provide pupils with safe water, a concern of the Ministry of Education and Higher Education (MoEHE).^{xl}
- v. The lack of safe public network drinking water **forces most (82.7per cent) households to purchase desalinated water, amounting to as much as a third of household income;** the cost is unaffordable for many.^{xli}
- w. The drinking water sources of the **17.3 per cent of the population who do not purchase desalinated drinking water** (approximately 300,000 people, of whom approximately 20 per cent, or 60,000, are infants and children under the age of five years)^{xlii} are private and agricultural wells, likely polluted by chemical as well as microbiological contaminants.
- x. There is no chain of custody for vended drinking because private **sector water quality is not monitored.**^{xliii}
- y. Each point of the water contamination cycle – from source through distribution by trucks, handling and storage in shop filling tanks, handling for household transport and storage in household tanks and jerry cans – is a **point of contamination of desalinated water**, transforming water that might have started the cycle free of bacteria into a threat to child health at the point of consumption.^{xliv}
- z. The water quality of an estimated **20,000 household reverse osmosis (RO) filtering units** is unknown but such units installed in **institutions and programmes serving children** have been found to be producing ineffectively filtered water, high in chemical and microbiological contaminants; experts believe it unlikely that most of the 20,000 units are properly maintained due to under-performing parts that are not being replaced due to lack of availability or cost, or rigorously cleaned and disinfected per directions for use.^{xlv}
- aa. **A developing threat by RO filtering:** RO plants produce up to 50 per cent reject water composed of chemical constituents removed by processing (e.g. nitrates and chlorides).

Reject water is sent into the Gaza sewage network for treatment, left untreated in ponds, or deposited directly on the ground. As desalination capacity increases, an increasing supply of reject water is sent to the wastewater treatment plants, where it further concentrates the total volume of wastewater and correspondingly decreases wastewater treatment efficiency. Chemically-concentrated reject water (sludge) deposited on the ground or seeping from ponds returns to the groundwater and further concentrates the chemical composition of the aquifer. As the concentration of chemicals to be filtered by RO filters increases, RO filtering efficiency eventually becomes ineffective.^{xlvi}

- bb. **Economic access barriers** due to high levels of poverty, unemployment and food insecurity in Gaza lead households to reduce safe water consumption cook with or mix desalinated water with contaminated network water or seek free or less costly sources of water that are likely contaminated.^{xlvii}
- cc. **Water-associated diseases account for approximately 26 per cent of disease in Gaza,**^{xlviii} and are the primary cause of child morbidity; diarrhoea – preventable and easily treated -- was the cause of 12 per cent of infant and young child deaths in Gaza in 2009^{xlix}.
- dd. **A fifth (20 per cent) of Gaza households** reported in five surveys between August and December 2009 (spanning dry and rainy seasons) that a child under five years had *diarrhoea* in the last two weeks;ⁱ over that year treatment was sought for children under three years from Ministry of Health (MoH) and United Nations Relief and Works Agency (UNRWA) clinics in 35,169 cases of diarrhoea; prevalence is considerably higher during and in the aftermath of destructive military offensives, which are associated with heightened public health threats.ⁱⁱ
- ee. Globally, most (88 per cent) diarrhoeal disease is attributed to unsafe water supply, inadequate sanitation and hygiene; **90 per cent of the 1.8 million people who die every year from diarrhoeal diseases (including cholera) are children under 5.**ⁱⁱⁱ
- ff. **Intestinal parasites, both helminths (worms) and protozoa, infect children throughout Gaza and are at high levels in some locations,** notably agricultural communities and near sewage treatment ponds: in one study, most children were infected by worms, including *Ascaris* ("giant roundworm") and many were found to have multiple infections and to be infected by adult worms; young children who are most vulnerable to acquisition of parasites and to development of pathologies are not reached by deworming treatments administered to schoolchildren.ⁱⁱⁱⁱ
- gg. **Hygiene practices in Gaza are not adapted** to chronic conditions of unsafe and inadequate water, poor sanitation and a contaminated environment.^{iv}
- hh. The **burden of care for diarrhoeal disease in the oPt** is high: Household survey-recorded diarrhoea prevalence amongst under-five Gaza children (20 per cent in UNICEF household study) is significantly higher than that recorded in 2006 (12 per cent in PAPFAM household study), when the World Bank estimated the annual cost of the health impacts of poor water and sanitation on under-five Palestinian children to be \$20 million, calculated to be 0.37 per cent of Palestinian GDP.^{lv}
- ii. **Diarrhoeal diseases “also affect the nutritional status of children,** indirectly adding to the disease burden.”^{lvi}
- jj. Globally, 133 million people suffer from **high intensity intestinal helminths infections,** which often lead to severe consequences such as **cognitive impairment, massive dysentery, or anaemia.**^{lvii}
- kk. Diarrhoea and intestinal parasites are *associated with malnutrition,* a complex interplay of nutrition and disease with economic, social, political, and cultural factors;^{lviii} worsening malnutrition, including underweight, wasting and stunting (exceeding 10per cent) is a concern to the oPt Health and Nutrition Cluster.^{lix}

- ll. ***Micronutrient deficiencies, called “hidden hunger”*** can cause serious and *irreversible cognitive and developmental deficits*, especially amongst young children; in addition to deficiencies of vitamin A (at least 22 per cent in children under five in 2004) and vitamin D (reportedly endemic, including cases of rickets) at high but currently unrecorded levels, anaemia prevalence among infants and under-five children in Gaza is very high, in some child populations far in excess of 40 per cent, indicating a *severe public health problem* in the WHO classification system (as high as 74 per cent among infants 9-12 months and an average of 32 per cent of school children in grades 1, 7 and 10).^{lx}
- mm. *In Gaza, “Inadequate nutrition policy, strategy, response, coordination, sustained community-based programming and donor support as well as maladapted behaviour make **increased child mortality, morbidity and impaired intellectual development inevitable.**”*^{lxi}
- nn. Occupation, blockade and movement and access *restrictions impede effective action* on the inter-related crises.^{lxii}
- oo. In addition to problems of access, governance and poor data, *aid interventions* that are not coordinated and prioritized within a larger planning and results framework, and are constrained by short-term funding, are ***not helping to arrest or reverse deteriorating Palestinian child health outcomes*** linked directly to or associated with unsafe water and a contaminated environment and deteriorating community health services and hospitals.^{lxiii}

4.2 Stalled progress toward MDGs

- a. ***Considerable disparity*** in child health indicators between the West Bank and Gaza and between rich and poor in Gaza (World Bank, 2009)
- b. ***Possible rise in infant mortality rate (IMR) in Gaza***, water-borne disease a major cause of morbidity (WHO, 2010)
- c. ***Child mortality higher in Gaza***, deteriorating conditions, reversal of small gains (UNICEF, 2007; UNDP Human Development Report-oPt, 2009/10)
- d. ***Palestine unlikely to meet MDG goals***, with deteriorated conditions for children in Gaza a factor (UNDP/PAPP, 2009; and PCBS, 2009)

5.0 Response: Action Plan to protect children from unsafe water in Gaza

This document outlines the rationale and strategy for a detailed plan to tackle intertwined early recovery needs, the ongoing environmental and human rights and protection crises and, for the foreseeable future, periodic humanitarian emergencies in Gaza. Under the theme ‘protecting children from unsafe water in Gaza’, this plan traces the water contamination cycle through to child health effects and proposes interventions at each of the points of accumulating risk.

These points of risk extend from contamination at source and during the water handling process through to child health effects of consumption of chemically and microbiologically polluted water and exposure to a contaminated environment. Measures include preventative measures, risk mitigation and elimination where possible and promoting and sustaining protective practices.

The action plan is intended to be situated within two planning frameworks: the PA’s current plan to achieve its Millennium Development Goals by 2015 (MDGs 1, 4 and 7), to be nested in a

larger plan, in development, to mitigate environmental deterioration and promote an adaptation strategy for climate change.^{lxiv} Implementation of the action plan would –

- a. improve access to **safe and adequate water and sanitation** and promote and support **adapted hygiene practices**, and
- b. improve **child health indicators** associated with (chemically and microbiologically) unsafe water and a contaminated environment.

It proposes implementation of a comprehensive, inter-sectoral, inter-agency plan for immediate- and medium-term responses within the national planning and results frameworks and early recovery and reconstruction plan for Gaza, 2009-10 (ERRP).^{lxv}

The framework for achievement of results is provided by the Palestinian Authority (PA) commitment to Millennium Development Goals (MDGs) 1, 4 and 7 and specific PA MDG targets and timelines. Their realization, or progress toward them, represents the common commitment of the Palestinian Authority (PA), UN and other agencies in the oPt and the international donor community. The aims are also compatible with those of Palestinian civil society groups.

This strategy outlines a plan to achieve results in two cycles linked to the MDG deadline of 2015. It is designed to be implemented, for the most part, under prevailing circumstances caused by blockade and associated restrictions. It considers removal of the blockade and the occupation to be, *inter alia*, necessary conditions for fulfillment of water safety and environmental protection goals and, accordingly, continued high-level advocacy to be a necessary related activity. It recognizes the likelihood of continued Israeli security forces offensives and makes recommendations for incorporation of infant and young child concerns into coordinated emergency preparedness plans.

Four funding modalities are described in the strategy. Selection of one of these or another model would be based on best fit for the strategy and action plan proposing partnerships or joint action with and among PA ministries, UN agencies, Palestinian and international agencies and community based organizations. Joint action does not preclude agency branding and other undertakings necessary for communicating with supporters and raising funds.

6.0 Purpose and scope of the Action Plan

The overarching purpose of this Plan is to protect children from unsafe water by means of assessment and management of the spectrum of risks to child health throughout the water contamination cycle.

Reflecting national commitments and international guidance for protecting children exposed to unsafe water and a contaminated environment, the Plan encompasses the following:

- a. a **risk assessment and management** approach based on a water safety plan;^{lxvi}
- b. **protective interventions in prioritised child settings** (communities to be mapped and prioritised, child settings to be prioritised--primarily homes and schools but also high threat settings);
- c. **health and nutrition interventions** where unsafe water is an underlying cause of disease at the household level, which in turn is an immediate cause of child malnutrition, death and disability;

- d. **social and behavioural change** that global research indicates is crucial to promoting and sustaining adapted hygiene and child care practices in a contaminated environment.

Crucially, the action plan is designed to be implemented within PA planning and results frameworks^{lxvii} and with reference to PA strategies tackling broader problems and underlying causes. These include war-damaged infrastructure, governance issues, blockade, environmental degradation and climate change.

7.0 Categories of child vulnerability for prioritised response

The child population of Gaza (799,341 under 18, an estimated 52 per cent in 2010) has differing vulnerabilities to the problems listed immediately above. Categories of at-risk children, to be determined by water and health mapping exercises,^{lxviii} include:

- a. Potentially all infants (estimated 57,750 in 2010) and pregnant women;
- b. Potentially all children under five years (estimated 251,829 in 2010);
- c. Infants and young children living in high threat communities where the highest levels of chemical and microbiological contamination of water have been documented through mapping;
- d. All children, especially those under five years, whose diarrhoea is not properly treated
- e. Infants who are not exclusively breastfed, the simplest protective measure for infants in contaminated environments;
- f. Preschool children exposed in kindergartens to unsafe water and dangerously unsanitary facilities;
- g. Children in schools where mapping by the WASH Cluster shows the highest levels of contaminated water and unhygienic sanitary facilities;
- h. Girls whose access to education is impeded by shared (poor) school sanitation facilities and standards;
- i. Children who have not yet entered the school system who are most vulnerable to acquisition of water-associated disease and development of pathologies and are not being properly treated for diarrhoea and regularly dewormed;
- j. School-age children who are not in school and not being properly treated for diarrhoea and regularly dewormed;
- k. Children living in communities with a high concentration of cesspits, near sewage ponds and working in or accompanying their farming parents to contaminated fields where unsafe practices expose them to water-associated diseases;
- l. Children who have been forcibly displaced from their homes or at risk of displacement;^{lxix}
- m. All children and pregnant women in homes receiving (chemically and microbiologically) contaminated water through the network, which is used in food preparation and mixed with drinking water to lower financial and labor costs;
- n. All children and pregnant women in homes where substandard household water storage conditions and practices expose them to contaminated water.

8.0 Rationale for inter-sectoral and multi-level approach focusing on children

- a. The **inter-linked crises** are expressed, *inter alia*, as crises of water scarcity and pollution and environmental contamination with adverse effects on public and child health, which must be the focus of this initiative.

- b. Addressing the problems in the complexity of their context will improve analysis and measurably **improve responses** and contribute to **PA development goals** and Gaza's long-term **viability**.
- c. Concerted, coordinated, comprehensive action by all stakeholders, employing proven initiatives and addressing **causes as well as effects** is warranted.
- d. Stakeholders in the oPt and international guidelines **recommend an inter-sectoral and multi-level approach**, whose efficacy is underpinned by global research.
- e. Decades-long **traditional short-term humanitarian action** in the oPt does not address comprehensively the range of problems or the complex and inter-linked causes contributing to assessed needs; and the **cluster approach** has been called upon by the IASC Global Cluster Evaluation to re-organize itself in order to meet the multiple challenges of work in the oPt and support national ownership and duty-holder capacity.^{lxx}
- f. **Children can be protected against chemical and microbiological contamination** through coordinated water and sanitation infrastructure improvements, adapted hygiene and food preparation practices, improved child care practices such as exclusive breastfeeding, and establishment of water, public health and environmental surveillance systems.
- g. **Child morbidity and mortality from diarrhoea can be reduced by multiple interventions** – by as much as 45 per cent through improved hygiene practices, by 35-39 per cent through improved household water treatment, by 6-25 per cent through improved water supply, and by 32 per cent through improved sanitation.^{lxxi}
- h. In the oPt, “preventive health practices, the spread of information regarding personal hygiene and control of disease, and raising health consciousness among disadvantaged groups, **probably play a pivotal role in speeding [infant and young child] mortality improvement**. Policies and interventions that enhance the role of local organizations in addressing these aspects in impoverished settings ... warrant consideration”^{lxxii}
- i. New UNICEF global research shows that **reducing disparities** in the national disease burden (by focusing on the poorest and most disadvantaged populations) **accelerates progress toward MDGs**.^{lxxiii}
- j. Whilst the focus is on protecting children from unsafe water immediately, improvement must be sustained through incorporation in the **national planning and results framework** and effective **public-private partnerships**.

9.0 Structure and approach of Action Plan

Developed in coordination with UNEP and in response to its environmental assessment of the Gaza Strip (2009), this HCT-commissioned plan aims to address the immediate and medium-term needs created by and deepened through synergistic effects of the several crises. It necessarily prioritizes actions that serve to protect children and can be sustained.

An effective response is a coordinated one, building on the collaborative successes detailed in the IASC evaluation of the cluster approach in the oPt.^{lxxiv}

9.1 Three-pronged approach

Comprising five sections for coordinated and integrated action, the action plan will protect children from unsafe water in Gaza with this inter-linked approach:

- **Protect Gaza children by addressing Gaza's water deficit in quantity and quality** according to international standards.

Proposal: augment the Palestinian Water Authority (PWA)/CMWU capacity to deliver an adequate and affordable quantity of safe water; ensure that augmentation of capacity through desalination and reject water handling is undertaken as part of an environmental plan.

- **Protect Gaza children from chemical and microbiological contamination of water** through sanitation and hygiene initiatives, including changed practices, in concert with above improvements in water quality; in particular, **protect vulnerable Gaza infants and pregnant women from nitrate contamination of the aquifer** caused primarily by sewage infiltration as well as by harmful agricultural practices.

Proposal: undertake sanitation and hygiene initiatives to reduce dramatically contamination of the environment; diminish household risk through a range of proven approaches; and decrease with the aim of eliminating further contamination of the aquifer through participation in an environmental plan. Ensure that households with infants and pregnant women have an adequate supply of safe water at point-of-use to protect infants under the age of six months from potential debilitating illness and the deadly effects of exposure to high levels of nitrates; and continue to perform due diligence per Gaza-specific WHO recommendations.

- **Protect Gaza children from contaminated water- and food-transmitted diseases** (diarrhoea and intestinal parasites) contributing to micronutrient deficiencies (“hidden hunger”) and sequelae of cognitive and developmental deficits and decreased immune system functioning, with negative impacts on child morbidity and mortality.

Proposal: employ an integrated, multi-sectoral approach to tackling micronutrient deficiencies, including supplementation, promotion of exclusive breastfeeding, improved nutrition and nutritional practices and reduction of water- and food-borne disease prevalence through improved water and sanitation infrastructure, point-of-use improvements and promotion of adaptive hygiene practices in prioritized communities, schools, kindergartens and homes.

9.2 Shared structure and components

a. Five inter-linked sections

- Water, sanitation and hygiene initiatives;
- Private (drinking) water sector management (in lieu of a regulatory environment in current conditions);
- Water- and food-borne disease control in children;
- Nutritional and growth deficits associated with water- and food-borne diseases caused by unsafe water and sanitation;
- Coordinated social and behavioural change initiatives to promote and sustain protective practices adapted to a high-risk environment, including exclusive breastfeeding.

b. Shared section components

- **Strategic objectives** are expressed in terms of protecting children from unsafe water, from the common objective^{lxxv} to the sector-specific.^{lxxvi}
- **Targets** consist of goals and targets set by relevant Millennium Development Goals (MDGs) and targets,^{lxxvii} World Fit for Children actions (WFFC)^{lxxviii} and official PA commitments.^{lxxix}
- **Broad objectives** are listed whose specific objectives will be determined by implementing agencies in consultation with mandated authorities and technical experts using abovementioned official targets. For example, as global WASH projects employ child health as an indicator as well as a goal,^{lxxx} the terms of this action plan's first broad objective reads, "Significantly decrease infant and under-five child mortality and morbidity (from diarrhoea and other water-borne diseases, including intestinal parasites and associated undernutrition)"; formulation of the specific target will require technical input from water and sanitation specialists, epidemiologists and health professionals, inter-sectoral coordination, joint logframe development and cross-sectoral monitoring.
- A **Guidance** sub-section provides key international reference and technical documents to shape the substance of the response and ensure good project and technical practice.^{lxxxi}
- **Priority project responses** reflect the UNEP report recommendation, HCT-assigned response theme "Protecting children from unsafe water", PA strategy, goals and targets, oPt-produced research and the consolidated appeals process (CAP) priorities.^{lxxxii}
- **Project resources** consist of Gaza-specific KBAP and oPt and international data, technical requirements, current standards and good practice, with access and navigation simplified by "tagging" the information to the particular topic through a specially adapted Endnotes format developed for this Action Plan.
- **Coordination, indicators and Monitoring and evaluation (M&E)** mechanism for agency outputs and child outcomes are to be developed under each Section/sector's co-lead agency and ministry counterpart in coordination with the UN's medium term response plan (MTRP), M&E framework, described above, according to terms of reference.^{lxxxiii}
- The five section/sector **lead agencies** will be represented in an executive body to oversee the inter-workings of the five sections according to terms of reference to be developed.
- **Risk assessment and management** exercises will be carried out and monitored during all phases of project implementation by the Section's coordinating agencies.^{lxxxiv}

10.0 Frameworks for action and coordination

The action plan's strategy has been developed to –

- Support **joint programming and a special fund** for coordinated, concerted action to achieve MDG commitments by 2015 (without impinging on agency identity and project branding);
- Promote **public-private partnerships and partnerships with civil society**, which is best placed to promote and protect Palestinian rights-holders over the long term;
- Support the **national planning and results frameworks** to achieve outcomes and build capacity of the State duty-holder;
- Support a shift to **early recovery and development** from short-term humanitarian action, with its well-documented short-comings as well as its inappropriate framework for conditions in Gaza;

- Support development of and participation in the PA's **emergency preparedness** plan for the inevitable emergency;
- **Widen the lens on assessed needs** to include the immediate and root causes of environmental degradation and climate change (with implications for fund-raising), as well as occupation, blockade and war damage;
- **Widen the legal lens** to include provisions for environmental protection and climate change adaptation;
- **Widen the advocacy lens** to include environmental rehabilitation and protection and climate change adaptation;
- Support **continued joint advocacy** to put an end to the blockade, the primary impediment to work in Gaza;
- Support **quick-start projects** prepared under the 2011 CAP and capable of being implemented under current circumstances, and evaluate new projects on a rolling basis in accordance with stipulated criteria and common goals, and without the well-documented shortcoming of short-term funding;
- Promote reference to **international standards and guidance and good programming practice**;
- Promote participation in the **common M&E framework** to achieve desired outcomes;
- Promote a **risk management approach**.

11.0 Foundation of Action Plan

The plan is built on a foundation of international norms and standards, internationally agreed and national established goals and targets, research findings and recommendations of key institutional players and NGOs in the oPt. Consultation with a wide range of stakeholders was undertaken by means of a workshop^{lxxxv} as well as through discussions with other government officials, UN agency representatives, cluster leads, Palestinian and international NGO representatives (AIDA) and through wide solicitation of feedback on drafts of this plan.

Essential multi-disciplinary information, located in the plan's project resources section, underpins the required inter-sectoral approach needed to respond effectively to inter-related needs. Specifically,

- The approach and the document design aim to overcome the information and project management cycle's "silo" problem and meet fast-moving operational needs;
- Sector- and issue-specific data and technical information, both global and oPt/Gaza-specific, support data-driven and good technical practice and monitoring for results-based management and measurable outcomes, both quantitative and qualitative;
- Excerpts from hyperlinked references to international norms, principles, guidelines and standards promote good practice, support project design for desired outcomes and protect citizens' rights.

Conclusion

The real physical scarcity of natural resources in the Gaza Strip is ...compounded by scarcity induced by conflict.^{lxxxvi}

A necessary condition for dealing effectively with the intertwined crises is an end to the Israeli occupation and blockade and associated destruction of essential services infrastructure. It is also true that the determinants of child health and a measure of environmental protection cannot wait for the day. Measures can and must be taken now to protect the (child) population from present day and projected worsening public health conditions. The measures proposed in this document are supportive of the PA and MTRP's early recovery plan and development commitments. They also are compatible with any scenario that might be drawn up for Gaza.

As required by a human rights-based approach that considers causes as well as effects and is the adopted approach of many actors in the oPt, attention to immediate and underlying causes as well as effects will enable humanitarian and development actors and the government to operate more effectively in the high-stakes, high-risk environment of the Gaza Strip. Without compromising mandates, agencies can adopt and support the PA planning and results frameworks. As important actors in front-line service delivery, humanitarian and development actors are well positioned to support essential services delivery by continuing to focus on the immediate and enduring need to protect children. They also can help to achieve measurable progress towards improved child health by participating in the MDG framework.

Reframed to reveal the extent to which water, sanitation, hygiene and public health needs are the outcome of inter-linked crises in Gaza; agency interventions can promote and support change that is sustainable in social, behavioural, organisational and environmental terms. By re-drawing timelines and re-conceptualizing needs, agencies can overcome the documented disadvantages of decades-long, conflict-focused, short-term humanitarian action.

The interaction of vulnerabilities, which act to reduce both the public health status of the population and livelihoods in Gaza, is illustrated by the following figure designed by United Nations Development Programme (UNDP) climate change consultants:

--international donor community support by virtue of its renewed commitments to achievement of the MDGs, a strategic objective of the Action Plan;

The sole recommendation to the oPt HCT is to consult and coordinate with the PA to implement this Action Plan and achieve the stated objectives by the 2015 MDG deadline, nesting the plan within the larger environmental and climate change adaptation strategy (in development). Specifically,

1. **select an appropriate joint programming and consolidated funding model** to ensure inter-agency coordination for achievement of agreed outcomes (see A. Strategy 5.2 Joint Action);
2. **establish a quick-start mechanism** for rapid implementation of this inter-agency plan through selection of CAP and non-CAP 2011 projects in a phase 1 (see A. Strategy 5.5 Project-ready Action Plan);¹
3. **launch immediately a fund-raising plan** to secure funds for the two implementation cycles, 2011-2013 and 2014-2015 (see A. Strategy, sub-section 5.4 Time-bound numerical targets);
4. ensure that **inter-agency and especially Gaza civil society participation** is maintained;
5. put in place the **organisational structure** needed to obtain and manage funds and monitor project outputs and outcomes;
6. explore **funding diversification** in connection with identified environmental and climate change issues.

¹ Project inclusion criteria are four-fold:

1. Responds to the recommendations or further implications of UNEP's Environmental Assessment of the Gaza Strip following the escalation of hostilities in December 2008 – January 2009 (September 2009);¹
2. Reflects the UN HCT-assigned theme, Protecting children from unsafe water in Gaza, and the approach outlined in this Strategy and Action Plan;
3. Fits within the UN HCT-assigned definition of an immediate or medium-term response; and
4. Has been vetted through the CAP or other agreed process by Sectors, Clusters and Sub-clusters, Working Groups or other recognized groupings such as PNGO and AIDA, and includes PA ministerial and/or technical counterparts.

With rolling project review envisioned, projects developed specifically for the Action Plan will be considered thereafter.

Agency inclusion requirements should include demonstrated capacity to implement effective projects according to the terms of the grant; ability to coordinate with others to achieve results; respect for good programming practice, such as accountability; support for human rights principles, including community participation; and gender analysis.

Joint action does not preclude agency branding and other undertakings necessary for communicating with supporters and raising funds.

Summary of recommended actions

Summary recommended actions are listed below; the detailed action plan should be consulted for information on sector objectives, PA's commitment to MDGs and other targets, relevant ministry work plan excerpts, international guidance and standards, risk management issues and other implementation information;

- **Project resources**, an adapted form of endnotes, are carried in the action plan as “tags” to the particular topic; the tags link to data, technical and background information, and related project and international guideline details to support a data-driven, inter-sectoral, multi-disciplinary initiative;
- **Detailed budgets, timelines and logframe** are not provided, as this plan is several levels away from preparation of such detail;
- **Numbered headings** of summarized actions correspond with those in the detailed Action Plan; **non-consecutive numbering below** is the result of non-project material having been omitted from this summary of recommended actions.

1.0 Protect children from unsafe water by ensuring sustainable access to safe and adequate water supply for drinking and domestic use and adequate sanitation

1.5 (b) Priority responses to ensure access to sustainable, safe and adequate drinking and domestic water

The following proposed project responses are derived from a needs analysis for water and sanitation in Gaza and based on PA strategy and planning, a desk review, action research in Gaza, wide consultation and international guidelines and good practice:

- Six levels of response, 1.5 (b) (i) - (vi), below;
- Project proposals were prioritized by the Gaza-based WASH Cluster and Drinking Water Working Group, including ministerial counterparts, according to established criteria.*

- 1.5 (b) (i) **Mapping (and gold-standard comprehensive survey)**: carry out concurrent mapping exercises – to be complemented by gold-standard comprehensive survey -- to identify quantity of water delivered to communities and exposure to chemical and micro-biological contamination, using WHO guidelines, Sphere standards and CMWU geographical information system (GIS) maps with reference to water quality parameters; identify corresponding communities and available health data, using MOH, UNRWA, NGO sources; coordinate with UNDP-proposed heavy metals testing initiative; and incorporate findings of OCHA-WFP “no-go zones” survey to ensure that marginalized communities are included in research and response plans:

* Project inclusion criteria: The proposed project (1) responds to the recommendations or further implications of the UNEP Report, Environmental Assessment of the Gaza Strip following the escalation of hostilities in December 2008 – January 2009 (September 2009), at http://www.unep.org/PDF/dmb/UNEP_Gaza_EA.pdf; (2) reflects the UN HCT-assigned theme, “Protecting children from unsafe water”; (3) fits within the UN HCT-assigned definition of an “immediate response”, and (4) has been vetted through the CAP or other process by members of Clusters, Sub-cluster, Working Groups or other recognized groupings and includes ministerial technical counterparts.

- **Volume:** identify volume of water available to communities and neighbourhoods by tracking how water is distributed by public network and by private vendors and how much is consumed from private and agricultural wells; and determine the total quantity consumed with reference to WHO guidelines (at least 20 l/c/d to qualify as basic access) for sustainable access to safe drinking water, and prioritise responses accordingly;
- **Chemical contaminants:** identify range and source of chemical contaminants (*i.a.*, nitrates, chlorides, fluoride and arsenic) by (public and private) water source and corresponding at-risk and marginalized communities and neighbourhoods, with reference to WHO exposure guidelines;
- **Microbiological contaminants:** identify microbiological contaminants by (public and private) water source and health data from corresponding at-risk and marginalized communities and neighbourhoods, with reference to PHC and other health data.

- 1.5 (b) (ii) **Water quality at point of use:** increase sustainable access to safe drinking and adequate domestic water and develop appropriate and technically sound solutions through implementation of a water safety plan at point of use; develop under the auspices of the MOH in coordination with PWA/CMWU, with reference to mapping results and guidance, above, and in accordance with WHO guidelines and resources and sphere standards as appropriate; and prioritize vulnerable communities, institutions serving children and households with pregnant and breastfeeding women and infants and under-five children (coordinated with the MOH and National Breastfeeding Committee, in Section 4.0, below).

Areas of risk include:

- **Access to filtered water:** for the 17 per cent of the surveyed population not purchasing filtered drinking water from vendors, investigate and categorize reasons (poverty, lack of access, use of home reverse osmosis (RO) filter, private or agricultural well) and respond with prioritized and appropriate plan of action;
- **Exposure to chemical contamination:** for the 70 per cent of the surveyed population using network water for food preparation and cooking, correlate communities and households with mapped source and network contamination and respond with prioritized and appropriate plan of action;
- **Exposure to microbiological contamination:** identify communities exposed to high levels of microbiological contamination using source and network contamination maps and respond with prioritized and appropriate plan of action, including chlorination or repair of wastewater network if cause is sewage infiltration;
- **Exposure to microbiological and chemical contamination from sub-optimal functioning of RO plants:** for those commercial RO plants and the estimated 20,000 household RO plants whose water quality is not monitored, correlate with mapped water source and network contamination data and respond with prioritized and appropriate plan of action;
- **Water safety plan for distribution points, households and institutions serving children:** investigate previous initiatives with lessons learned and Knowledge, Beliefs, Attitudes and Practices (KBAP) to inform responses; develop protocols based on international standards for secondary and household storage of water and water handling, in Guidance, above; select appropriate and technical and communication approaches; carry out under the auspices of MoH primary health care (PHC)/Environment Department and Department of Health Education and Promotion, in coordination with PWA/CMWU and in connection with social and behavioural change initiatives, Section 5.0, below.

- 1.5 (b) (iii) **Water quality in public network:** Increase the quality of public network water through support of a PWA/CMWU Water Safety Plan, in the framework of the GERRP, in coordination with WHO/EMRO/CEHA, with reference to guidance, above, and according to WHO guidelines, MoH standards and sphere standards as appropriate:
- Identify hazardous water sources that exceed contamination guidelines, in connection with water source mapping activity and in partnership with PWA/CMWU and UNDP; and develop prioritized and appropriate responses, including installation of small or medium-sized desalination units where no other solutions to improving water quality and supply are feasible;
 - Increase the quality of network water by supporting development of PWA/CMWU and MoH quality surveillance system (sanitary inspection and water testing); chlorination supply and household monitoring (in connection with social and behavioural change campaign in section 5.0, below, to build household awareness of benefit and tackle taste barrier); and public protection plan (rapid response to alert public to contamination threat and protective measures);
 - Support PWA/CMWU assessments of the blending process where desalination units are operating with the aim of producing and reliably supplying safe water for drinking and domestic purpose.
- 1.5 (b) (iv) **Water supply in public network and augmentation; and network extension:** Increase the quantity of public network water by repairing the war-damaged network, improving network efficiency and augmenting supply, and extend the network to cover all Gazans, under the direction of PWA/CMWU and in accordance with its Water Governance Plan:
- Increase the quantity of water by minimizing network water loss: replace, recalibrate or install and monitor water meters to identify sources of water leaks and losses, including illegal connections; and repair, replace or provide new community networks and household connections;
 - Increase the supply of affordable safe water: provide PWA/CMWU with small- and medium-sized brackish water desalination plants, with filtered water provided to the public at reduced cost, in response to inter-linked problem of water usage below the minimally acceptable level and increasingly unaffordable rates charged by the private sector; develop prioritized list for appropriate response with reference to maps and survey findings and WHO guidelines and MoH and sphere standards; provide training in professional management standards; to be carried out as an interim measure until conditions permit installation of large seawater desalination plant;
 - Extend the water network: extend or connect to the network the two per cent of Gazans (est. 30,000 people, of which over half are children), who remain without access to the public water system.
- 1.5 (b) (v) **Water monitoring system:** Implement WHO recommendation to “monitor drinking water quality through public health surveillance of the entire water supply system from source to consumer”; support capacity building of MoH and PWA/CMWU, according to respective mandates, for accurate and rapid water quality testing, along with advanced data systems to record, organize, and report data to responsible and appropriate agencies and institutions; carry out plan in

accordance with guidance, above, and other references listed in this Section; and coordinate with UNDP-proposed heavy metals testing and response initiative:

- Laboratories: establish labs of adequate capacity to measure contaminant levels;
- Quality assurance (QA): develop quality assurance and quality control procedures;
- Testing and reporting: establish testing schedule and test for contamination on a regular and continuous basis; train operators of all plants to follow sampling protocols correctly; determine protocol for reporting non-compliance of listed contaminants;
- Data sharing: make data available to the concerned authorities through electronic access and periodic reports.

1.5 (b) (vi) **Fuel to power Gaza electricity plant**: ss intermittent water supply contributes to pollution of network water through ingress of microbiological and chemical contamination and quality degradation of standing water in pipes, incorporate contamination argument in advocacy strategy calling for continuous fuel importation to reduce frequency of interruption of supply.

1.6 (b) **Priority responses to ensure sustainable access to adequate community sewage treatment, school and household sanitation and school handwashing facilities**

The following proposed project responses are derived from a needs analysis for water and sanitation in Gaza and based on PA strategy and planning, action research in Gaza, wide consultation, international guidelines and good practice and a desk review inclusive of international research and meta-analysis of effectiveness:

- Nine levels of response, 1.6 (b) (i) - (ix), below;
- Project proposals were prioritized by the Gaza-based WASH Cluster and Drinking Water Working Group, including ministerial counterparts, according to criteria.

1.6 (b) (i) Wastewater treatment plant repairs: support repairs by PWA/CMWU where urgently needed in connection with planned network rehabilitation and household connections, below; coordinate with all stakeholders, including UNDP.

1.6 (b) (ii) Volume of raw sewage treated: increase the quantity of sewage treated by providing PWA/CMWU with small- and medium-sized wastewater treatment plants as appropriate and in consultation with all stakeholders; develop prioritized list for appropriate response with reference to maps and survey findings and PWA/CMWU standards; to be carried out as an interim measure until conditions permit repair of existing wastewater plants and installation of additional plants.

1.6 (b) (iii) Coastal water quality: develop and strengthen mandated authority's programme for monitoring coastal water quality by setting national standards based on scientific literature; identify priority area and establish sampling regime; store coastal water quality data and disseminate to authorities concerned.

1.6 (b) (iv) Environmentally appropriate handling of RO reject brine: explore and implement alternative to current practice of depositing chemically contaminated reverse osmosis (RO) reject brine in sewer system or on ground; develop regulatory and compliance regime (see Section 2.0 of this document) in coordination with

coastal water quality programme, directly above, and solid and hazardous waste disposal, directly below.

- 1.6 (b) (v) Solid and hazardous waste: decrease the threat to child health through improper disposal of household waste² and exposure to environmental hazards from soil and groundwater contaminated by improper disposal of solid and hazardous waste: support mandated authority's initiative to sample soil and groundwater at prioritized sites; identify potential threats from detected wastes; and establish project to clean up sites.
- 1.6 (b) (vi) Wastewater network repairs or extension: support PWA/CMWU plan to rehabilitate the network and repair breaks that are a source of microbiological and chemical contamination of the public water network; and extend the network to prioritized areas according to population density experiencing recurring flooding, cesspit concentration or geographical features (e.g. Wadi Gaza).
- 1.6 (b) (vii) Household connections to increase wastewater network coverage: support PWA/CMWU plan for increased household connectivity, prioritized by areas of population density experiencing recurring flooding, cesspit concentration or geographical features (e.g. Wadi Gaza).
- 1.6 (b) (viii) Sanitation facilities: support MoH / MoEHE plan to install appropriate sanitation and handwashing facilities in prioritized institutions serving children (in connection with social and behavioural change campaign in Section 5.0 below).
- 1.6 (b) (ix) Support efforts to ensure import of fuel to power continuously Gaza sewage treatment plants: design advocacy strategy based on detailed investigation, as 50-80 million litres daily of untreated or partially treated sewage discharged into the sea creates serious public health and environmental consequences and constitutes a major threat to child health.

2.0 Protect children from unsafe water through regulation of the private water sector

2.5 Priority responses to increase the safety and health standard of RO water sold by the private sector and control the hazardous waste by-product generated

The following proposed project responses are derived from a needs analysis of drinking water quality and supply in Gaza and the operations and impact of private RO plans. They are based on PA strategy and planning, PWA's draft guidelines and Council of Ministers Decree to regulate private water suppliers in Gaza, a desk review, wide consultation (with UNEP in particular) and international guidelines and good practice:

- Four levels of response, 2.5 (a) - (d), below;
-

- Project proposals were prioritized by the Gaza-based Drinking Water Working Group, including ministerial counterparts, according to established criteria.
- 2.5 (a) **Mapping response plan:** assemble and review all data on private source drinking water quality and accumulating risks in drinking water handling cycle (in coordination with mapping exercise carried out in Section 1.0, above); support PWA/CMWU in identification of priority responses.
- 2.5 (b) **Private sector regulation of drinking water:** develop and implement incentives and capacity-building plan for private water suppliers as interim measure whilst the PWA/CMWU, MOH, and municipalities develop the means for enforcement of the PWA/CMWU's legislation and guidelines for regulation of the private water sector. Under the direction of PWA/CMWU:
- Analysis: identify technical problems (source contamination and series of accumulating risk over the water contamination cycle); Knowledge, Beliefs, Attitudes and Practices (KBAP), materials shortages (disinfectant, filters, chlorine); political and vested interests (among others, no commercial licenses for undeclared wells); behavioural barriers contributing to accumulating risk (by suppliers, vendors and end-users) and user barriers (dislike of chlorination, poor storage disinfection practices);
 - Opportunities: pinpoint areas with no vested interest (providing contaminated water) that represent opportunities for water quality improvement (desalination plant technician training and materials needs), and improved distributor, vendor and household practices (in connection with social and behavioural change campaign, Section 5.0, below);
 - Interim response plan: implement incentive plan for private suppliers (e.g., training in transport and storage protocols, tanker truck maintenance and repair assistance, certification in exchange for testing and monitoring system); municipalities (e.g., plant and tanker inspections, regular supply of submitted samples to appropriately equipped testing facility staffed by trained technicians, public posting of results and transparent certification process and public posting of currently certified distributors and vendors); supply and maintenance of specialized testing kits and equipment for existing water testing laboratories; and system for external testing and verification;
 - Private water quality monitoring: ensure that water, health and other relevant authorities and municipal officials are informed of water quality results;
 - Drinking water price control policy options: given the high proportion of household income dedicated to private water purchasing, increasing poverty and household food insecurity and decreasing household income and employment, set against the high profit margin of private vendors, support review by appropriate authority of a possible pricing policy for vended water; alternatively or in combination, increase significantly the capacity of PWA/CMWU to produce desalinated water for low-cost distribution across Gaza (in coordination with proposed initiative to increase the number of desalination plants owned by PWA/CMWU, Section 1.0, above).
- 2.5 (c) **Re-mineralization of desalinated water:** support desk research into the health impact of long-term consumption of demineralized (desalinated) water, especially on children and women; and support MoH and PWA/CMWU policy and, as appropriate, plan of action required by minimally acceptable health standards (re-mineralization, water blending or supplements of calcium, magnesium and fluoride for at-risk groups):

- **Public health:** review relevant oPt data and health research, expert consensus and guidelines documents, with special reference to the relationship between low calcium and magnesium intake in drinking water and pregnancy outcomes (low birth weight, a leading cause of infant mortality in Gaza), childhood rickets (documented child health problem in Gaza), sub-optimal fluoride levels, and other associated negative health outcomes;
- **Specifications:** review technical specifications, practicalities and cost for re-mineralizing network water; and evaluate current practice, including Israel's;
- **Policy development and plan:** support MOH and PWA/CMWU inter-ministerial policy development process and implementation plan, including monitoring and enforcement, as indicated by the evidence.

- 2.5 (d) **Interim plan for controlling disposal of reject brine produced by RO plants:** Support inter-ministerial review of international standards and proposed draft PWA/CMWU guidelines governing environmentally appropriate handling of contaminated RO reject brine produced by Gaza RO plants, under the auspices of the PWA/CMWU and with the support of technical bodies in the UN and PNGO sector (Palestinian Hydrology Group (PHG) -Gaza); develop optimal interim disposal plan under prevailing circumstances for private RO plant operators; carry out in coordination with initiatives undertaken in section 1.0, above.

3.0 **Protect children from the effects of unsafe water through improved control of water-borne diseases and appropriate home management of (acute watery) diarrhoea**

3.5 **Priority responses to improve control of diarrhoea and other water-borne diseases, including intestinal parasite infections, caused by unsafe water and an unsanitary environment**

The following proposed project responses are derived from a needs analysis of water-borne diseases among children in Gaza, including conflict and post-conflict spikes; and based on PA strategy and planning, a desk review, action research in Gaza, wide consultation and international guidelines and good practice:

- Four levels of response, 3.5 (a) - (d), below;
- Project proposals were prioritized by the Gaza-based Health Cluster, including ministerial counterparts, according to established criteria.

- 3.5 (a) **Diarrhoea control:** support international call for recommitment to diarrhoea control and implementation of global 7-Point Plan for Comprehensive Diarrhoea Control in connection with MoH-adopted handbook of integrated management of childhood illness (IMCI); coordinate with Sections 1.0 and 2.0 (water, sanitation and hygiene, above), 4.0 (nutrition and breastfeeding, below) and 5.0 (social and behavioural change, below):

- **Prevention and treatment:** make diarrhoea prevention and treatment a key element of community-based primary health care, employing an integrated approach encompassing training and supplies (including rotavirus vaccine, oral rehydration salt (ORS) promotion, health workers with updated kits); review recent Gaza data on diarrhoea prevalence

(under normal chronic and acute emergency conditions) and location and West Bank data revealing deterioration of socio-economic conditions and decrease in water quality and supply, along with seasonal variation, account for a marked increase in the prevalence of diarrhoea and intestinal parasites and, in the light of socio-economic and environmental similarities, monitor and respond as appropriate;

- Global-standard home management: promote appropriate home management of (acute watery) diarrhoea to improve child outcomes and decrease the household burden of seeking medical treatment and the PHC patient load;
- MOH capacity building and compliance: support renewed tri-partite health system (and private sector if possible) commitment to control diarrhoea through 7-Point Plan, in coordination with IMCI roll-out, including training in new protocols for medical professionals and health care workers and additional MOH hospital, laboratory and PHC capacity building;
- New global guidance for ORT: adopt low-osmolarity ORS and zinc as policy guidance and practice; ensure packaging for effective delivery (e.g., combining zinc and oral rehydration salts (ORS) in single treatment kit) in PHCs and community outreach programme;³
- Water and sanitation link: accelerate provision of safe and adequate water and sanitation infrastructure and services; establish inter-ministerial/agency structure (MOH with PWA/CMWU and others); and employ a community-based approach in connection with Sections 1.0 and 2.0, above;
- Social and behavioural change: investigate knowledge, beliefs, attitudes and practices (KBAP); change hygiene-related behaviours through community participation, health education and health promotion activities, among other social and behavioural change initiatives outlined in Section 5.0, below;
- Sustain improved practice: monitor practitioner compliance with MOH protocols and good international practice; monitor household practices and child outcomes; sustain improvements in prevention and treatment through monitoring and adaptation of social and behavioural change initiatives outlined in Section 5.0, above;
- Preparedness planning: incorporate social and behavioural change and preparedness perspective for emergencies when diarrhoea-related infant and under-five child morbidity and mortality could breach WHO, MOH and UNRWA epidemiological alert/alarm thresholds.⁴

3.5 (b) **Intestinal parasites control**: control parasite infections with comprehensive approach in connection with improved diagnostics, diarrhoea control and monitoring and support of child nutritional status (micronutrient deficiencies, including anaemia); carry out in connection with initiatives in sections 1.0 and 2.0 (water, sanitation and hygiene), Section 4.0 (nutrition and breastfeeding) and Section 5.0 (social and behavioural change):

- Research review and response planning: under auspices of MoH, review and respond as appropriate to current and recent emergency-period data in Gaza, and recent oPt research findings on prevalence of (persistent) diarrhoea and intestinal parasites, varying risk factors (household, socio-economic, livelihood, seasonal, geographical, environmental) and association with household food insecurity, new research on good practice curative and preventative measures, and recommendations for effectively

targeted water, sanitation, hygiene and health responses and emergency preparedness, coordinated with social and behavioural change initiatives in section 5.0, below;

- Integrated approach to decrease prevalence of parasite-associated anaemia and stunting: support development of new MoH protocol of integrated package for improved diagnosis and sequenced intervention of curative treatment and nutritional support; train staff, monitor practitioner practice and child outcomes and ensure supplies in all PHCs; coordinate (mass) de-worming and other parasite interventions with initiatives in water, sanitation and hygiene (Sections 1.0 and 2.0, above), nutrition and breastfeeding (Section 4.0, below), and social and behavioural change (Section 5.0, below); and ensure that out-of-school and other marginalized children are reached;
- Monitoring: employ improved diagnostic methods to determine the actual prevalence of intestinal parasite infections and incorporate into the epidemiological surveillance system; include working and out-of-school children as well as schoolchildren in measurement and response.

3.5 (c) **Epidemiological Surveillance System**: implement WHO recommendation to “strengthen the epidemiological surveillance system among all health providers [in order to] monitor and follow up on the epidemiological situation and to identify more precisely the geographical areas where particular problems occur and actions are needed”.

3.5 (d) **Emergency plan for diarrhoea and intestinal parasites control**: ensure that water-borne disease control protocols relevant to emergency and post-conflict conditions are developed, included in MoH updated disaster preparedness and management plan, incorporated in common protocols and MoH-UN-inter-agency training, and supplies are stockpiled and added to kits.

4.0 **Protect children from unsafe water and sewage-contaminated food that contribute to disease and undernutrition (“hidden hunger”) through nutritional support and exclusive breastfeeding**

4.5 **Priority responses in child nutrition and exclusive breastfeeding**

The following proposed project responses are derived from a needs analysis of nutritional deficits associated with water-borne diseases in Gaza and based on PA strategy and planning, including the GERRP, a desk review, action research in Gaza, wide consultation and international guidelines and good practice:

- Seven levels of response, 4.5 (a) - (g), below;
- Project proposals were prioritized by the Gaza-based Nutrition sub-cluster, including ministerial counterparts, according to established criteria.

4.5 (a) **Enabling environment**: continue efforts to build a supportive environment for infant and under-five child care and nutrition, including adoption of an integrated and effective approach to micronutrient deficiencies and actions aimed at achieving a high rate of exclusive breastfeeding and appropriate and timely complementary breastfeeding, through further development of the following:

- (i) Policy, legislative and regulatory environment and enforcement regime;

- (ii) Inter-departmental structure (MoH Nutrition, Community Health, Health Education and Promotion and Nursing Departments) and MOH-civil society partnership (such as the National Breastfeeding Committee (NBFC));
 - (iii) Cooperation between the NBFC and MoH Environmental Department and UN, international and civil society partners for prioritized water quality testing in households with pregnant and nursing mothers and infants and young children;
 - (iv) Cooperation with UNRWA and NGO PHCs;
 - (v) Partnerships for effective action on nutrition/undernutrition (national entities, UN, INGOs, PNGOs, civil society).
- Leadership and Partnerships: support MOH leadership and partnerships for infant and under-five child feeding and micronutrient supplementation standards and practices through updated MCH National Nutrition Protocols and under the auspices of the National Breastfeeding Committee (NBFC) and its Plan of Action; establish partnerships for effective action on anaemia and other nutritional deficiencies;
 - Standardized term and measurement: work through the NBFC to achieve consensus on the global definition of exclusive breastfeeding in order to eliminate discrepant survey findings and counterproductive guidance; provide continuous training at all facilities where anthropometric measurement of children for nutritional assessment purposes is undertaken;
 - Policy on micronutrient supplement product and integrated joint action on anaemia, Vitamin A and other nutritional deficiencies: support MOH review of micronutrient supplement in order to reduce non-compliance with current product and selection of a tested palatable product; effectively address what the WHO classification system categorizes as a “severe public health problem” of anaemia among children and women; link adoption of effective and integrated approach to anaemia to policy and action on critical efforts to reduce the incidence of low birth weight, the third leading cause of child mortality in the oPt; develop appropriate plan of action and improved surveillance in connection with water, sanitation and hygiene initiatives in Sections 1.0 and 2.0, above, and diarrhoea and intestinal parasites control in Section 3.0, above, and social and behavioural change initiatives in Section 5.0, below;
 - Standards and practice: at the hospital, PHC and community level and under the auspices of the MOH and NBFC, support (continued) administrative roll-out and personnel awareness, policy and practice around relevant national and international standards, protocols, guidelines, codes of conduct and messaging content and protocols for social and behavioural change initiatives on safe water, child nutrition and supplementation and exclusive and complementary breastfeeding (in connection with Section 5.0, below);
 - Technical information on breastfeeding: establish website under the auspices of the NBFC to provide technical guidance on breastfeeding, resources and other information to professionals and community workers (and mothers with access to the Internet);
 - Link with safe water and hygiene practices: support consideration of NBFC Sub-Committee on Safe Drinking and Household Water with the aim of monitoring MOH water quality testing results and forwarding data on households with infants and under-five children for prioritized water quality testing (in connection with Sections 1.0 and 2.0, above, and Section 5.0 below);
 - Enforcement of BMS ban: support development of enforceable MOH and NBFC plan in cooperation with (i) the Ministry of the National Economy (MONE) and Customs Authority and other relevant authorities to train staff and monitor and report violations of

the legal prohibition on breastmilk substitute (BMS), especially during emergencies; (ii) notify and train hospital and PHC management, medical professionals and employees of the prohibition; notify national and international humanitarian agencies and obtain their signatures to a declaration to abide by the law; and notify private sector importers, traders and pharmacists of the legal prohibition; ensure its availability where needed by mothers for medical or similarly valid reasons according to guidelines.

4.5 (b) **Hospital/PHC/CHW/VHW plan to increase infant and under-five child survival:**

- Support integrated functional links and continuity of care between professional staff and services to new mothers and infants and young children; support application of updated MOH MCH National Nutrition Protocols, National Breastfeeding Committee (NBFC) Plan of Action and global standards and good practice for infant and young child nutrition and care, referenced in the Guidance section, above; monitor and measure compliance and child outcomes:
- Improved maternal care: provide new mothers with antenatal counseling and critical postnatal care including with MOH PHC community health workers (CHW) and NGO village health workers (VHW), including initiation of breastfeeding and continued good practice through counseling and other support;
- Nutrition and care standards and practices: support unified, Gaza-wide system of standards, protocols, training, materials and practices and effective and palatable micronutrient supplement in hospitals and PHC and in PHC community-outreach and home visiting programme;
- Baby-friendly initiatives: introduce 10 Steps to Successful Breastfeeding across Gaza (as introduction to the Baby-Friendly Hospital Initiative (BFHI) to be introduced in prioritized hospitals per MOH plan).

4.5 (c) **PHC systems development to increase infant and under-five survival:** under auspices of MOH and Department of Nutrition, support implementation of the MCH National Nutrition Protocols and NBFC Plan of Action for infant and under-five child nutrition, effective and palatable nutritional supplementation and promotion of exclusive breastfeeding and timely and appropriate complementary feeding:

- Data: support and help implement MOH's ongoing work in establishing nutrition surveillance system at the PHC level, establishing 18 more sentinel surveillance sites (in addition to 15 in place), generating improved data and analysis;
- Nutritional support: support and help implement MOH plan for PHC-level malnutrition and micronutrient deficiency prevention and management and breastfeeding standards; develop new micronutrient protocol and product for immediate action; use updated MOH MCH National Nutrition Protocols to train practitioners; provide necessary supplies, equipment and training (for standard anthropometric measurement) to aid in identification of malnourished children;
- Intestinal parasites-persistent diarrhoea-nutritional deficiency link: update MOH protocol for integrated response package to reflect global guidance and practice for confirming diagnosis and sequencing treatment consisting of effective broad-spectrum medication and nutritional support; coordinate with water and sanitation improvements and social and behavioural change; train staff, monitor practitioner practice and child outcomes and ensure required supplies in all PHCs;

- Emergency nutrition systems development: support MOH plan to establish community-based severe acute malnutrition management (SAM) protocol, according to which exclusive breastfeeding is a key emergency nutrition response.
- 4.5 (d) **Community-based network to increase infant and under-five child nutritional status and survival**: under auspices of the MOH and NBFC, measurably improve essential under-five child and infant care and survival, including exclusive breastfeeding, through support of Gaza-wide inter-agency initiatives; mobilize communities and health systems through “Call to Action” campaigns to promote critical preventive and protective measures:
- Gaza-wide partnerships: explore feasibility of five-part governorate-based system in prioritized communities and assign area responsibilities to cooperating agencies;
 - Postnatal partnerships: strengthen capacity and links between PHC personnel and MoH’s CHWs and NGO VHWs in prioritized communities; cooperate with PHC Community Health Workers (CHW) to focus on new mother health needs, breastfeeding and infant care, hygiene and safe water as protective measure given standard practice of discharging new mothers several hours after giving birth;
 - Infant and young child nutrition: incorporate child nutritional status monitoring and nutrition education in new mother support initiatives;
 - Link with safe water and improved hygiene practices: support safe water plan in prioritized households with pregnant and breastfeeding women and infants and under-five children (in connection with Sections 1.0 and 2.0, above, and Section 5.0 below).
- 4.5 (e) **Exclusive and complementary breastfeeding to increase infant and under-five survival**: measurably improve the rates of exclusive and timely and appropriate complementary breastfeeding and infant and under-five child survival and development under the auspices of the NBFC and in connection with the three-part PHC system (MOH, UNRWA and NGOs):
- Promotion: support and help implement the NBFC’s Gaza-wide breastfeeding promotion campaign, including media and religious leaders;
 - Peer helpline: support establishment and management of 24/7 breastfeeding support telephone helpline by trained peers in accordance with MOH policy and protocols and international good practice;
 - Counseling: support and help implement MoH PHC-linked sustainable community-level lactation counseling; support networks in prioritized communities, promote role of midwives as lactation counselors, adopt tested approaches such as positive deviance and Trials of Improved Practices (TIPS); carry out in connection with Section 5.0 below.
- 4.5 (f) **Food consumption patterns and healthy eating habits**: Support collaborative review of disaggregated child nutrition statistics and findings of surveyed food consumption patterns among families and children; improve and expand targeted food assistance, including school meals/snacks, milk and fortified biscuits, and promote optimal nutritional practices to protect against rising undernutrition levels and their causes, in combination with effective nutritional supplementation; advocate for entry of adequate cooking gas; monitor and measure outcomes.
- 4.5 (g) **Emergency plan to support infant care and child nutrition and exclusive breastfeeding**: Support MOH protocol for Infant and Young Child Feeding (IYCF) during Emergencies and MOH-NBFC (inter-agency and civil society) Plan

of Action; develop awareness and training initiative for humanitarian responders based on the MOH protocol and Operational Guidance on IFE; and improve household-level infant care and child illness management, with neighbourhood support network.

- NBFC support: Develop MOH and NBFC support plan for lactating mothers to counter plummeting rate of exclusive breastfeeding during emergency conditions; provide information to all new mothers on exclusive breastfeeding in emergency;
- IYCF inter-agency coordination: Ensure humanitarian agency preparedness, including awareness, training, stocking and provision of nutrient-dense and energy-dense foods to small children and effective and palatable micronutrient product, in coordination with MOH and Department of Nutrition;
- BMS regulation: Develop inter-ministerial and inter-agency plan for enforcement of unregulated BMS supply; designate BMS supplier in coordination with MOH and Department of Nutrition

5.0 Promote improved community, family and child practices to protect against unsafe water and a contaminated environment through Communication for Development (C4D):

- (a) environmental health, hygiene and handwashing with soap (HWWS);
- (b) diarrhoea, intestinal parasites and other water- and food-borne diseases control; and
- (c) child nutrition and exclusive breastfeeding.

5.5 (b) Priority C4D responses for environmental health, hygiene and handwashing with soap (HWWS)

5.5 (b) (i) C4D policy and message authority: support the MoH Health Education and Promotion Department as coordinating and standards authority for development of Gaza-wide C4D campaigns in environmental health, hygiene and HWWS; select framework for action and coordinate message design, standards and roll-out plan with UNRWA and other UN agencies, INGOs and PNGO (Sections 1.0 and 2.0, above);

5.5 (b) (ii) C4D Working Group (WG): form inter-agency, inter-sectoral (cluster), multi-disciplinary working group to cooperate with inter-ministerial counterparts:

- C4DWG: create terms of reference, skills building plan and partnership with advertising professionals to advise on social and behavioural change communication strategies for government, humanitarian and development programmes in Gaza;
- Action research: map and assess current social and behavioural change initiatives in the oPt, lessons learned and recommendations for conducting social and behavioural change initiatives, etiology of environmentally-linked diarrhoea, technical aspects of improved hygiene practices, water availability for requiring increased consumption, household ability to purchase disinfectants and soap, and measured knowledge, beliefs, attitudes and practices (KBAP),- and evaluated effectiveness of approaches previously used in the oPt, such as drama and different media, child-to-child, positive deviance and Trials of Improved Practices (TIPS);

- Case study: consider with the aim of adopting and adapting the Hygiene Improvement methodology of the USAID Environmental Health Project implemented by Save the Children, a large-scale, tested and evaluated “comprehensive approach to reduce diarrhoeal disease by promoting good hygiene practices, improving access to safe water and adequate sanitation and providing an enabling environment”; and list persons and organizations in Gaza with training and experience in the range of social and behavioural change initiatives.
- 5.5 (b) (iii) C4D media and advocacy campaign: develop and implement media and advocacy campaigns in environmental health, hygiene and HWWS practices after reviewing new learning in motivating change in hygiene behaviour and investigating knowledge, beliefs, attitudes and practices (KBAP):
- Global Handwashing Day on 15 October: organize an annual Guinness Book of World Records event for the largest number of school children washing their hands (and singing/chanting message) at the same time; and ensure media coverage and informed commentary;
 - Palestinian HWWS Day: recruit community, religious and school leadership to initiate annual HWWS initiative at the start of the dry season and ensure media coverage and informed commentary by public health authorities; support school HWWS activities;
 - “Shara’a Simsim”: after ascertaining that the programme continues to be widely viewed in Gaza as well as the West Bank, establish agreement with the directorship of Palestinian “Sesame Street” to work with the show’s creative department on regular featuring of public health, hygiene and HWWS issues;
 - “Edutainment”: explore other countries’ experiments and successes in “edutainment” to influence and sustain behaviour and social change;
 - Media: place or commission articles, interviews or regular hygiene Q&A feature in the media on public hygiene issues protective of children and families.
- 5.5 (b) (iv) C4D in schools: implement hygiene and HWWS campaign in prioritized schools; coordinate message design and roll-out plan with UNRWA; coordinate with water and sanitation project responses for installation of appropriate safe water and sanitary infrastructure and ensure ongoing provision of soap (Section 1.0, above);
- 5.5 (b) (v) C4D in maternity wards and PHCs: implement hygiene and HWWS campaign in all maternity wards and prioritized PHCs, in cooperation with UNRWA and NGO PHCs;
- 5.5 (b) (vi) C4D in prioritized communities and households: develop communication strategies to improve environmental health, hygiene and HWWS practices in prioritized communities and households; base strategies on Knowledge, Beliefs, Attitudes and Practices (KBAP), community participation and suggestions, and successful practice in the oPt ; coordinate with water, sanitation and hygiene project responses and reference Guidance (Section 1.0, above);
- 5.5 (b) (vii) Public-Private Partnership for HWWS: establish partnership with Gaza soap manufacturers and advertisers to promote handwashing with soap (HWWS), using standards established by the MoH and Global Public-Private Partnership for HWWS;

- 5.5 (b) (viii) Recreational water and beaches safety campaign: mitigate risks to children from exposure to sewage-contaminated recreational water and beaches by supporting plan to signpost dangerous beaches and raise awareness with affected municipalities and in communities, schools and households; coordinate with initiatives carried out under Section 1.0; and in coordination with the PA plan to rehabilitate the Gaza shoreline.
- 5.5 (b) (ix) Emergency C4D plan for hygiene and HWWS: ensure that a hygiene practices protocol relevant to emergency conditions is developed and included in the MOH's updated disaster preparedness and management plan and incorporated in common protocols and training.
- 5.6 **C4D for diarrhoea and intestinal parasite control**
- Seven levels of response, 5.7 (b) (i) – (vii), below;
 - Project proposals were prioritized by the Gaza-based Health Cluster, including ministerial counterparts, according to established criteria.
- 5.6 (b) (i) Medical professionals (MoH, hospitals and PHCs): improve diarrhoea control by promoting medical professionals' re-commitment through compliance with international protocols, *inter alia*, for control of water-borne diseases, by supporting MoH strategy and work plan for human resources capacity-building and quality improvements; sustain compliance by supporting initiatives to ascertain and change knowledge, beliefs, attitudes and practice (KBAP); and monitor household experience in diarrhoea treatment advice and management;
- 5.6 (b) (ii) Nurses and community health workers (CHW): improve diarrhoea control through support of nurses' and CHWs' increased authority and KBAP to advise on treatment and home management of (acute watery) diarrhoea; build counselling knowledge and skills in controlling diarrhoea; and monitor household experience in diarrhoea treatment advice and management;
- 5.6 (b) (iii) Pharmacists: counter drug misuse and unhelpful traditional practices by changing pharmacists' KBAP; work with pharmacists' union to improve practices and develop anti-diarrhoea and -intestinal parasites campaign, inclusive of producing, packaging and advertising a palatable ORS with zinc;
- 5.6 (b) (iv) Schoolchildren: review other countries' experiences in teaching children about control of water-borne diseases and design oPt initiatives to help them protect themselves from illness and reinforce other household learning; extend Young Researchers water-testing project to Gaza;
- 5.6 (b) (v) Households: use new learning on behaviour and social change to understand household Knowledge, Beliefs, Attitudes and Practices (KBAP) in treating diarrhoea and design responses accordingly;
- 5.6 (b) (vi) Agricultural communities: work with farming families to identify disease risks (e.g. use of sewage-based fertiliser, defecation in the field) and develop appropriate protective measures; determine whether locale has been subject to flooding by or disposal of untreated sewage and take appropriate steps.

- 5.6 (b) (vii) Community advocacy: promote participation of community members or schoolchildren (e.g. Young Researchers project, described above) in advocacy initiatives, such as measuring infant and young child water-borne disease prevalence prior to and after infrastructure improvements, hygiene interventions and C4D initiatives, and using results to lobby authorities for further improvements and to promote sustained behavioural and social change at the personal, household and community levels.
- 5.7 (b) **Priority C4D responses for child nutrition and exclusive breastfeeding**
- Four levels of response, 5.7 (b) (i) – (iv), below;
 - Project proposals were prioritized by the Gaza-based Nutrition sub-cluster, including ministerial counterparts, according to established criteria.
- 5.7 (b) (i) C4D policy and message authority: support the MoH Health Education and Promotion Department and National Breastfeeding Committee (NBFC) as coordinating and standards authority for development of Gaza-wide C4D campaigns in child nutrition and exclusive and complementary breastfeeding practices; coordinate message design, standards and roll-out plan with UNRWA and other UN agencies, INGOs and PNGO (Section 4.0, above);
- 5.7 (b) (ii) C4D media and advocacy campaigns: develop strategies for media and advocacy initiatives in child nutrition (Anaemia and Vitamin A/D Alert campaign) and exclusive and timely and appropriate complementary breastfeeding; and promote improved food practices and healthy nutrition to households and among children and schoolchildren;
- 5.7 (b) (iii) C4D initiatives in prioritized communities: review international research and relevant data and experiences of Palestinian NGOs providing nutrition and breastfeeding counseling and support to mothers; develop strategies for initiatives in child nutrition and exclusive breastfeeding in prioritized communities based on child nutrition data (Section 4.0, above); coordinate with water and sanitation projects (Sections 1.0 and 2.0, above) and control of water-borne illnesses in infants and young children (Section 3.0, above);
- 5.7 (c) (iv) Emergency C4D plan to support child nutrition and exclusive breastfeeding: Develop a strategy to promote child nutrition, emergency feeding and exclusive breastfeeding relevant to emergency conditions; develop component relevant to the ban on breastmilk substitute during emergencies; ensure strategies are included in the MOH's updated disaster preparedness and management plan and common protocols and training (in accordance with referenced Guidance and in coordination with initiatives undertaken in Sections 3.0 and 4.0, above).

Endnotes

- ⁱ UN Environmental Programme (UNEP), Environmental Assessment of the Gaza Strip following the escalation of hostilities in December 2008 – January 2009 (September 2009), at http://www.unep.org/PDF/dmb/UNEP_Gaza_EA.pdf.
- ⁱⁱ For information on the PA's Environmental Quality Authority (EQA) and the Environmental Sector Working Group, see Palestinian National Authority, Ministry of Planning, Building Palestine: Achievements and Challenges, Report of the Palestinian National Authority to the AHLC (13 April 2010), at http://www.mop.gov.ps/new/web_files/publishing_file/PA%20AHLC%20Report%20April%2013%202010.pdf. See also documents from the Mediterranean Climate Change Initiative, in which the PA participated, at <http://www.medclimatechangeinitiative.org/content/final-draft-joint-declaration-establishment-mediterranean-climate-change-initiative-now-onli>; the Joint Declaration (22 October 2010) is available at <http://www.medclimatechangeinitiative.org/sites/default/files/Joint-Declaration.pdf>.
- ⁱⁱⁱ UNEP, Environmental Assessment of the Gaza Strip following the escalation of hostilities in December 2008 – January 2009 (September 2009), at http://www.unep.org/PDF/dmb/UNEP_Gaza_EA.pdf.
- ^{iv} UNEP, Environmental Assessment of the Gaza Strip following the escalation of hostilities in December 2008 – January 2009 (September 2009), at http://www.unep.org/PDF/dmb/UNEP_Gaza_EA.pdf, p 6.
- ^v These include UNEP, Environmental Assessment of the Gaza Strip following the escalation of hostilities in December 2008 – January 2009 (September 2009), at http://www.unep.org/PDF/dmb/UNEP_Gaza_EA.pdf; The World Bank, Assessment of Restrictions on Palestinian Water Sector Development (April 2009), at <http://pwa.ps/Portals/PWA/08da47ac-f807-466f-a480-073fb23b53b6.pdf>; UNDP, Programme of Assistance to the Palestinian People (UNDP/PAPP), Climate Change Adaptation Strategy for the Occupied Palestinian Territory, Final Report of Consultants to UNDP/PAPP Initiative: Climate Change Adaptation and Programme of Action for the Palestinian Authority (December 2009); and WFP and FAO, Occupied Palestinian Territory: Food security and vulnerability analysis report (A synthesis of recent surveys and studies) (22 December 2009), at [http://www.reliefweb.int/rw/RWFiles2009.nsf/FilesByRWDocUnidFilename/LSGZ-7YYETY-full_report.pdf/\\$File/full_report.pdf](http://www.reliefweb.int/rw/RWFiles2009.nsf/FilesByRWDocUnidFilename/LSGZ-7YYETY-full_report.pdf/$File/full_report.pdf).
- ^{vi} UNDP/PAPP, Climate Change Adaptation Strategy for the Occupied Palestinian Territory, Final Report of Consultants to UNDP/PAPP Initiative: Climate Change Adaptation and Programme of Action for the Palestinian Authority (December 2009), pp 41-42, 61 and Figure 3.10 on p 47 on public health outcomes.
- ^{vii} UNDP/PAPP, Climate Change Adaptation Strategy for the Occupied Palestinian Territory, Final Report of Consultants to UNDP/PAPP Initiative: Climate Change Adaptation and Programme of Action for the Palestinian Authority (December 2009), pp 43 and 77.
- ^{viii} See this Strategy's Section 3.0 Needs analysis, and the Action Plan's Section 4.0 Protect children from unsafe water and sewage-contaminated food that contribute to disease and undernutrition ("hidden hunger") through nutritional support and exclusive breastfeeding.
- ^{ix} Oli Brown and Alec Crawford, Rising Temperatures, Rising Tensions: Climate Change and the Risk of Violent Conflict in the Middle East (International Institute for Sustainable Development (IISD): 2009), at http://www.iisd.org/pdf/2009/rising_temps_middle_east.pdf.
- ^x For data and discussion of population figures and administrative area of pre-1948 Gaza Strip and figures for UNRWA registered refugees in Gaza, see UNCTAD Consultant Wael Ennab, Population and Demographic Developments in the West Bank and Gaza Strip until 1990 (UNCTAD/ECDC/SEU/1: 28 June 1994), <http://www.unctad.org/en/docs/poecdcsseud1.en.pdf>. UNRWA registered refugee statistics in 1950 for the Gaza Strip indicate a caseload of 198,227 persons; Palestine Remembered, at <http://www.palstineremembered.com/Acre/Palestine-Remembered/Story559.html>, Table 3, Refugees registered with UNRWA (with discussion of statistical problems). Population estimates for Gaza Strip (Urban), Gaza Strip, 1950-2015 at [http://books.mongabay.com/population_estimates/full/Gaza_Strip_\(Urban\)-Gaza_Strip.html](http://books.mongabay.com/population_estimates/full/Gaza_Strip_(Urban)-Gaza_Strip.html).
- ^{xi} Palestinian Central Bureau of Statistics. 2010.

^{xii} The official population of Gaza was reported in July 2010 to be 1.54 million persons; and in 2006 children under five represented nearly a fifth (18.75%) of Gaza's population: see PCBS, On the Eve of the International Population Day: Statistical review on the status of the Palestinian population (Ramallah—Palestine: 11 July 2010) http://www.pcbs.gov.ps/Portals/_pcbs/PressRelease/PeopleDay_2010E.pdf; and UNRWA, West Bank and Gaza Strip Population Census of 2007: Briefing Paper (January 2010), at <http://www.unrwa.org/userfiles/2010091595334.pdf>, p 21, Table 9B: Age Distribution of the OPT, End-2007.

^{xiii} UNEP, Environmental Assessment of the Gaza Strip following the escalation of hostilities in December 2008 – January 2009 (September 2009), at http://www.unep.org/PDF/dmb/UNEP_Gaza_EA.pdf; and reports referenced throughout this document. See also the Action Plan's Project Resources (Endnotes) in Section 1.4 Sustainable access to safe and adequate water supply for drinking and domestic use.

^{xiv} Gruppo di Volontariato Civile (GVC) and Palestinian Hydrology Group (PHG), Water Quality Monitoring Campaigns, Middle Area of the Gaza Strip (October 2009), at <http://www.phg.org/reports.asp?year=2009>. See also the Action Plan's Project Resources (Endnotes) in Section 1.4 Sustainable access to safe and adequate water supply for drinking and domestic use.

^{xv} UNICEF/PHG, Water, Sanitation and Hygiene Household Survey – Gaza (April 2010), at http://www.unicef.org/oPt/FINAL_WASH_REPORT.pdf, Table C.16, p 52; and the Action Plan's Project Resources (Endnotes) in Section 3.0 Protect children from the effects of unsafe water through improved control of water-associated diseases and appropriate home management of (acute watery) diarrhoea; and Section 5.6 C4D for diarrhoea and intestinal parasite control.

^{xvi} A UNDP/PAPP reports notes, "[T]he the state of water and sanitation in Gaza is today posing serious environmental and public health concerns.... Major interventions are needed to help reverse the current deterioration of the water and sanitation situation in the Gaza Strip. [T]he water quality challenge is one that predates Cast Lead, and is expected to continue to be a challenge to the Gaza Strip in the years to come. No solution has yet been implemented to address the water deficit challenge and the situation continues to deteriorate"; UNDP/PAPP, One Year After Report: Gaza Early Recovery and Reconstruction Needs Assessment (May 2010), at <http://www.undp.ps/en/newsroom/publications/pdf/other/gazaoneyear.pdf>, pp 40 and 96.

^{xvii} Palestinian Central Bureau of Statistics (PCBS), Survey on the Impact of War and Siege on Gaza Strip (April-June 2009), at http://www.pcbs.gov.ps/Portals/_PCBS/Downloads/book1595.pdf, Table 29.

^{xviii} UNICEF/PHG, Water, Sanitation and Hygiene Household Survey – Gaza (April 2010), at http://www.unicef.org/oPt/FINAL_WASH_REPORT.pdf, p 46.

^{xix} PCBS, Press Release on the Occasion of World Water Day (22 March 2010), at http://www.pcbs.gov.ps/Portals/_pcbs/PressRelease/final-water09e.pdf. See also the Action Plan's Project Resources (Endnotes) in Section 1.0 Protect children from unsafe water by ensuring sustainable access to safe and adequate water supply for drinking and domestic use and adequate sanitation; and Section 2.0 Protect children from unsafe water through regulation of the private water sector.

^{xx} Consolidated Appeal Process (CAP) 2011, Needs Assessment Framework (NAF) for Water, Sanitation and Hygiene (WASH) in the oPt (draft: October 2010), pp 8-9. See also the Action Plan's Project Resources (Endnotes) in Section 1.6 (b) Priority responses to ensure sustainable access to adequate community sewage treatment, school and household sanitation and school handwashing facilities, including 1.6 (b) (i) Wastewater treatment plant repairs; 1.6 (b) (ii) Volume of raw sewage treated; 1.6 (b) (iii) Coastal water quality; 1.6 (b) (vi) Wastewater network repairs or extension; 1.6 (b) (vii) Household connections to increase wastewater network coverage; and Section 5.5 C4D for environmental health, hygiene and handwashing with soap (HWWS).

^{xxi} According to the draft CAP NAF for WASH, there are about 40,000 cesspits in use and the cost of emptying them is prohibitive for many families. Cesspits concentration in communities where wastewater connectivity is relatively low creates environmental hazards and higher concentration of nitrates in the corresponding part of the aquifer. Consolidated Appeal Process (CAP) 2011, Needs Assessment Framework (NAF) for Water, Sanitation and Hygiene (WASH) in the oPt (draft: October 2010), pp 8-9. See also the Action Plan's Project Resources (Endnotes) in Section 1.6 (b) Priority responses to ensure sustainable access to adequate community sewage treatment, school and household sanitation and school handwashing facilities.

^{xxii} See the Action Plan's Project Resources (Endnotes) in Section 1.6 (b) Priority responses to ensure sustainable access to adequate community sewage treatment, school and household sanitation and

school handwashing facilities; 4.5 (a) Enabling environment, Link with safe water and hygiene practices; and 5.7 C4D for child nutrition and exclusive breastfeeding.

^{xxiii} UNDP/PAPP, Human Development Report—occupied Palestinian territory 2009/10: Investing in Human Security for a Future State (January 2010), at http://204.200.211.31/contents/file/PHDR2010/PHDR_Book_Eng.pdf, Figures 34 and 35, p 168. See also the Action Plan’s Project Resources (Endnotes) in Section 1.4 Sustainable access to safe and adequate water supply for drinking and domestic use; 1.6 Sustainable access to adequate sanitation in community, school and household and school handwashing facilities; and 5.5 (b) Priority C4D responses for environmental health, hygiene and handwashing with soap (HWWS).

^{xxiv} UNDP/PAPP, Human Development Report—occupied Palestinian territory 2009/10: Investing in Human Security for a Future State (January 2010), at http://204.200.211.31/contents/file/PHDR2010/PHDR_Book_Eng.pdf, Table 10, p 169.

^{xxv} UNICEF oPt Monthly Update (March 2010), at http://www.unicef.org/oPt/UNICEF-oPt_March_Update.pdf, p 2; UNICEF/PHG, Water, Sanitation and Hygiene Household Survey – Gaza (April 2010), at http://www.unicef.org/oPt/FINAL_WASH_REPORT.pdf, p 8; and The World Bank, Assessment of Restrictions on Palestinian Water Sector Development (April 2009), at <http://pwa.ps/Portals/PWA/08da47ac-f807-466f-a480-073fb23b53b6.pdf>, p 27.

^{xxvi} IRIN, Three Different Takes on Aid Priorities in Gaza (5 August 2010), at <http://www.irinnews.org/Report.aspx?ReportId=90073>. On 26 October 2010 the EU’s representative to the West Bank, Gaza and UNRWA, Christian Berger, highlighted the deteriorating water situation in Gaza. He said the question of whether there is a humanitarian crisis in Gaza “is a matter of definition. “Are there people starving in the street? No. Is there disease raging through Gaza? No. But all human indicators are going downward. There are not enough classrooms, not enough spare parts, not enough qualified doctors, and a general deterioration in the water. All humanitarian indicators – unemployment, poverty – are going downward, so in that sense there is a constant deterioration of the humanitarian situation in Gaza”; Jerusalem Post: Herb Keinon, 'Gaza awash in coriander...and other consumer goods': EU diplomat Christian Berger says for people to be able to buy goods there needs to be vast improvements in economy (26 October 2010), at <http://www.jpost.com/Israel/Article.aspx?id=192770>

^{xxvii} Consolidated Appeal Process (CAP) 2011, Needs Assessment Framework (NAF) for Water, Sanitation and Hygiene (WASH) in the oPt (draft: October 2010), p 4.

^{xxviii} The Education sector’s main concerns in Gaza include inadequate school sanitation (due to lack of dedicated funding and access to materials, such as cement, and separate toilets for girls in mixed schools), water quantity and quality (as a result of the need of many schools to rely upon tanker delivery and on-site storage, a known contamination risk) and, as a consequence, poor hygiene conditions: Consolidated Appeal Process (CAP) 2011, Needs Assessment Framework (NAF) for Water, Sanitation and Hygiene (WASH) in the oPt (draft: October 2010), pp 4 and 10.

^{xxix} See the Action Plan’s Project Resources (Endnotes) in Section 1.5 (b) (ii) Water quality at point of use; and Section 3.0 Protect children from the effects of unsafe water through improved control of water-associated diseases and appropriate home management of (acute watery) diarrhoea.

^{xxx} According to WHO, “Chemical contaminants of drinking-water are often considered a lower priority than microbial contaminants, because adverse health effects from chemical contaminants are generally associated with long-term exposures, whereas the effects from microbial contaminants are usually immediate. Nonetheless, chemicals in water supplies can cause very serious problems”; WHO, Chemical Safety of Drinking-Water: Assessing Priorities for Risk Management, at http://www.who.int/water_sanitation_health/dwq/dwchem_safety/en/index.html; and WHO, Water-related diseases: methaemoglobinemia, at http://www.who.int/water_sanitation_health/diseases/methaemoglobin/en/.

See the Action Plan’s Project Resources (Endnotes) in Section 1.5 (b) (ii) Water quality at point of use, Exposure to chemical contamination.

^{xxxi} UNICEF/PHG, Water, Sanitation and Hygiene Household Survey – Gaza (April 2010), at http://www.unicef.org/oPt/FINAL_WASH_REPORT.pdf, Table C.5, p 41.

^{xxxii} See reports referenced in this Strategy section and listed in the document’s bibliography: UNEP (2009, p 57), The World Bank (2009, p 28), WFP-FAO (2009, p 26), UNDP/PAPP (2010, p 43), Consolidated Appeal Process/CAP (2010, p 47 and 2011 draft WASH Needs Assessment, p 7), and the

UNHCT-oPt Task Force Terms of Reference/TOR (2010) for a response plan to protect children from unsafe water in Gaza.

^{xxxiii} See the Action Plan's Project Resources (Endnotes) in Section 1.5 (b) (i) Mapping and gold-standard comprehensive survey.

^{xxxiv} WHO summary requirement for water service level to promote health:

No Access (<5 lpcd, collected, very high health concern)

Basic access (~20 lpcd, collected, high health concern)

Intermediate access (~50 lpcd, on-plot tap, low health concern)

Optimal access (≥100 lpcd, water supplied through multiple taps continuously, very low health concern).

Guy Howard and Jamie Bartram, Domestic Water Quantity, Service, Level and Health (2003), at http://www.who.int/water_sanitation_health/diseases/WSH0302exsum.pdf, Table S1.

^{xxxv} UNEP, Environmental Assessment of the Gaza Strip following the escalation of hostilities in December 2008 – January 2009 (September 2009), at http://www.unep.org/PDF/dmb/UNEP_Gaza_EA.pdf, p 38. See also the Action Plan's Project Resources (Endnotes) in Section 1.5 (b) (i) Mapping and gold-standard comprehensive survey.

^{xxxvi} WHO, Domestic Water Quantity, Service, Level and Health, by Guy Howard and Jamie Bartram (2003), at http://www.who.int/water_sanitation_health/diseases/WSH0302exsum.pdf, Table S1.

^{xxxvii} UN, Consolidated Appeal Process (CAP) 2011 Needs Assessment Framework (NAF) for Water, Sanitation and Hygiene (WASH) in the oPt (draft: September 2010); and UNICEF/PHG, Water, Sanitation and Hygiene Household Survey – Gaza (April 2010), at http://www.unicef.org/oPt/FINAL_WASH_REPORT.pdf, p 15 and Tables C.6-8, pp 42-44. See also the Action Plan's Project Resources (Endnotes) in Section 1.5 (b) (i) Mapping and gold-standard comprehensive survey.

^{xxxviii} WHO EMRO/CEHA Consultation on Minimum Household Water Security Requirements and Health: Hirotsugu Aiga, Household Water Consumption and the Incidence of Diarrhoea (Amman, Jordan, 1-3 December 2003), at

<http://www.emro.who.int/ceha/pdf/Diarrhoea2.pdf>. See also the Action Plan's Project Resources (Endnotes) in Section 3.0 Protect children from the effects of unsafe water through improved control of water-associated diseases and appropriate home management of (acute watery) diarrhoea; and Section 5.6 (b) Priority C4D responses for diarrhoea and intestinal parasite control.

^{xxxix} The CAP 2011 draft Needs analysis has tentatively identified around 30 Gaza communities (1,134,806 persons) where network water quality is particularly poor: Consolidated Appeal Process (CAP) 2011, Needs Assessment Framework (NAF) for Water, Sanitation and Hygiene (WASH) in the oPt (draft: October 2010), pp 7-8. For information and data on water network contamination, see the Action Plan's Project Resources (Endnotes) in Section 1.5 (b) (ii) Water quality at point of use; and Section 1.5 (b) (iii) Water quality in public network.

^{xl} UN, Consolidated Appeal Process (CAP) 2011 Needs Assessment Framework (NAF) in the oPt—WASH Cluster (draft: September 2010), p 10.

^{xli} UNICEF/PHG, Water, Sanitation and Hygiene Household Survey – Gaza (April 2010), at http://www.unicef.org/oPt/FINAL_WASH_REPORT.pdf, Tables C.1, p 37 and C.3, p 39.

In 2006 PHG wrote, "The financial crisis which has struck all of the OPT, from the national to the local level has made the provision of services literally impossible....Water prices are highly variable and inconsistent from one community to the next. The price of water is so high in some communities that individuals and families can no longer afford to meet even their minimum water needs"; Palestinian Hydrology Group-WASH MP, Water for Life (chapter 4: Realizing Palestinian Water Rights: An Essential Step in Achieving the MDGs) (2006), at <http://www.phg.org/wash%2Dmp/>, pp 66-68.

See the Action Plan's Project Resources (Endnotes) in Section 2.5 (b) Private sector regulation of drinking water, Drinking water pricing policy options.

^{xlii} The official population of Gaza was reported in July 2010 to be 1.54 million persons, and in 2006 children under five represented nearly a fifth (18.75%) of Gaza's population: see PCBS, On the Eve of the International Population Day: Statistical review on the status of the Palestinian population (Ramallah—Palestine: 11 July 2010) http://www.pcbs.gov.ps/Portals/_pcbs/PressRelease/PeopleDay_2010E.pdf; and UNRWA, West Bank and Gaza Strip Population Census of 2007: Briefing Paper (January 2010), at <http://www.unrwa.org/userfiles/2010091595334.pdf>, p 21, Table 9B: Age Distribution of the OPT, End-2007.

^{xliii} See the Action Plan's Project Resources (Endnotes) in Section 2.0 Protect children from unsafe water through regulation of the private water sector.

^{xliiv} See the Action Plan's Project Resources (Endnotes) in Section 2.0 Protect children from unsafe water through regulation of the private water sector. See also Gruppo di Volontariato Civile (GVC) and Palestinian Hydrology Group (PHG), Water Quality Monitoring Campaigns, Middle Area of the Gaza Strip (October 2009), at <http://www.phg.org/reports.asp?year=2009>.

^{xliiv} See the Action Plan's Project Resources (Endnotes) in Sections 1.5 (b) (ii) Water quality at point of use; and 5.5 C4D for environmental health, hygiene and handwashing with soap (HWWS).

^{xlivi} See the Action Plan's Project Resources (Endnotes) in Section 1.6 (b) (iv) Environmentally appropriate handling of RO reject brine; and Section 2.5 (d) Interim plan for controlling disposal of reject brine produced by RO plants.

^{xliivii} UNICEF/PHG, Water, Sanitation and Hygiene Household Survey – Gaza (April 2010), at http://www.unicef.org/oPt/FINAL_WASH_REPORT.pdf; and the Action Plan's Project Resources (Endnotes) in Section 1.5 (b) (i) Mapping and gold-standard comprehensive survey; Section 1.5 (b) (ii) Water quality at point of use; and Section 2.5 Priority responses to increase the safety and health standard of RO water sold by the private sector and control the hazardous waste by-product generated.

^{xliiii} The World Bank, Assessment of Restrictions on Palestinian Water Sector Development (April 2009), at http://pwa.ps/Portals/_PWA/08da47ac-f807-466f-a480-073fb23b53b6.pdf, p 28.

^{xlix} Amnesty International, Gaza's Civilians 'Betrayed' by International Community (Press Release: 22 December 2009), at

<http://www.amnesty.ie/our-work/gaza%E2%80%99s-civilians-%E2%80%98betrayed%E2%80%99-international-community>; and Amnesty International (and 15 other humanitarian and human rights agencies), Failing Gaza: No rebuilding, No recovery, No more excuses (December 2009), at http://www.amnesty.org.uk/uploads/documents/doc_20012.pdf, p 10.

ⁱ UNICEF/PHG, Water, Sanitation and Hygiene Household Survey – Gaza (April 2010), at http://www.unicef.org/oPt/FINAL_WASH_REPORT.pdf, Table C.16, p 52.

ⁱⁱ For data and other information on diarrhoea prevalence and related burden of care, shortcomings in surveillance systems, preventative approaches and treatment protocols, and the effects of forced closure of essential services during military action when risks are greatest, see the Action Plan's Project Resources (Endnotes) in Section 3.0 Protect children from the effects of unsafe water through improved control of water-associated diseases and appropriate home management of (acute watery) diarrhea; and Section 5.6 (b) Priority C4D responses for diarrhoea and intestinal parasite control.

ⁱⁱⁱ WHO, Water, Sanitation and Hygiene Links to Health: Facts and Figures, at http://www.who.int/water_sanitation_health/publications/facts2004/en/index.html.

ⁱⁱⁱⁱ See the Action Plan's Project Resources (Endnotes) in Section 3.5 (b) Intestinal parasites control; and Section 5.6 (b) Priority C4D responses for diarrhoea and intestinal parasite control. November 2010 news: The Bill & Melinda Gates Foundation and Dubai Cares will partner with the Global Network for Neglected Tropical Diseases to deworm UNRWA schoolchildren in the oPt. Announced on 7 November 2010, the one-year program will reach 258,000 children enrolled in UNRWA schools: Dubai Cares to implement de-worming program in Gaza and West Bank in partnership with global network, AMEinfo.com (9 November 2010), at <http://www.ameinfo.com/248210.html>. For information, see the Global Network for Neglected Tropical Diseases, at <http://globalnetwork.org/>.

^{iv} UNICEF/PHG, Water, Sanitation and Hygiene Household Survey – Gaza (April 2010), at http://www.unicef.org/oPt/FINAL_WASH_REPORT.pdf; and the Action Plan's Project Resources (Endnotes) in Section 3.0 Protect children from the effects of unsafe water through improved control of water-associated diseases and appropriate home management of (acute watery) diarrhoea; and Section 5.6 (b) Priority C4D responses for diarrhoea and intestinal parasite control.

^{iv} See The World Bank, Assessment of Restrictions on Palestinian Water Sector Development (April 2009), at http://pwa.ps/Portals/_PWA/08da47ac-f807-466f-a480-073fb23b53b6.pdf, p 22; and UNICEF/PHG, Water, Sanitation and Hygiene Household Survey – Gaza (April 2010), at http://www.unicef.org/oPt/FINAL_WASH_REPORT.pdf, Table C.16, p 52.

^{vi} UN-Water, Global Annual assessment of Sanitation and Drinking Water: Targeting resources for better results/ GLAAS (2010), at http://www.unwater.org/activities_GLAAS2010.html.

^{vii} WHO, Water, Sanitation and Hygiene Links to Health: Facts and Figures, at http://www.who.int/water_sanitation_health/publications/facts2004/en/index.html.

^{lviii} Malnutrition is not a simple outcome of inadequate food and disease, say researchers. “Ultimately, malnutrition results from inadequate intake of nutrients and/or from disease factors that affect digestion, absorption, transport, and utilization of nutrients. However, there are also economic, social, political, and cultural causes of malnutrition, which underscore the close link between malnutrition, the general standard of living, and whether a population is able to meet its basic needs, such as food, housing, and health care. Because of the link between malnutrition and social factors, the nutritional status of a population is a sensitive indicator of the quality of life in the community....

Determining the nutritional status of populations: The prevalences of wasting and stunting have been widely used to characterize the nutritional status of populations. Wasting reflects a deficit in weight relative to height due to a deficit in tissue and fat mass, whereas stunting reflects a deficit in height relative to age due to linear growth retardation. Epidemiological evidence suggests that the first response to a nutritional and/or infectious insult is weight loss (wasting), followed by retardation in linear growth (stunting). If the insult persists, children will cease to grow in height and will lose weight, thus augmenting the process of wasting. Finally, if children survive, they will become chronically wasted. As a consequence, the prevalence of wasting in populations will be high....[T]he prevalence of wasting reflects survival factors because only those who survive until the survey date are measured. Wasting in early childhood also has well-established effects on later morbidity and mortality [including low birth weight in babies]....

Given the association between LBW and prevalence of wasting, research at individual and community levels should concentrate on identifying factors that affect mother- and child-caring capacities in different settings. For example, actions to improve the rights and social position of women might also improve the nutritional status of children under five years of age”; Isabel D. Fernandez et al., WHO, Bulletin of the World Health Organization 2002, 80 (4), [http://whqlibdoc.who.int/bulletin/2002/Vol80-No4/bulletin_2002_80\(4\)_282-291.pdf](http://whqlibdoc.who.int/bulletin/2002/Vol80-No4/bulletin_2002_80(4)_282-291.pdf), pp 282 and 289.

^{lix} Increasing malnutrition conditions in Gaza and associated micronutrient deficiencies are a leading concern of the Nutrition sub-cluster; UN, Consolidated Appeal Process (CAP) 2011 Needs Assessment Framework (NAF) in the oPt—Health and Nutrition Cluster (draft: September 2010). See the Action Plan’s Project Resources (Endnotes) in Section 4.0 Protect children from unsafe water and sewage-contaminated food that contribute to disease and undernutrition (“hidden hunger”) through nutritional support and exclusive breastfeeding; and Section 5.7 C4D for child nutrition and exclusive breastfeeding.

^{lx} Increasing malnutrition conditions in Gaza and associated micronutrient deficiencies are a leading concern of the Nutrition sub-cluster; UN, Consolidated Appeal Process (CAP) 2011 Needs Assessment Framework (NAF) in the oPt—Health and Nutrition Cluster (draft: September 2010). See Action Plan’s Project Resources (Endnotes) in Section 4.3 Broad objectives, Child micronutrient deficiencies (“hidden hunger”); and Section 5.7 C4D for child nutrition and exclusive breastfeeding.

^{lxi} UNICEF, Feedback on the Rapid Nutritional Assessment of Children 6-59 months in the Gaza Strip (April 2008), PowerPoint, at http://www.irinnews.org/pdf/UNICEF_Rapid_Nutrition_Assessment_report_Gaza.pdf, slide 22. See also the Action Plan’s Project Resources (Endnotes) in Section 4.5 Priority responses in child nutrition and exclusive breastfeeding; and Section 5.7 C4D for child nutrition and exclusive breastfeeding.

^{lxii} For a discussion, see The World Bank, Assessment of Restrictions on Palestinian Water Sector Development (April 2009), at <http://pwa.ps/Portals/PWA/08da47ac-f807-466f-a480-073fb23b53b6.pdf>, p

iii.

^{lxiii} Hanan F Abdul Rahim et al., Maternal and child health in the occupied Palestinian territory, The Lancet series: Health in the Occupied Palestinian Territory 2 (5 March 2009), at <http://www.thelancet.com/series/health-in-the-occupied-palestinian-territory>. See also the Action Plan’s Project Resources (Endnotes) in Section 3.0 Protect children from the effects of unsafe water through improved control of water-associated diseases and appropriate home management of (acute watery) diarrhoea; Section 4.0 Protect children from unsafe water and sewage-contaminated food that contribute to disease and undernutrition (“hidden hunger”) through nutritional support and exclusive breastfeeding; and Section 5.0 Promote improved community, family and child practices to protect against unsafe water and a contaminated environment through Communication for Development (C4D).

^{lxiv} For information on the PA’s Environmental Quality Authority (EQA) and the Environmental Sector Working Group, see Palestinian National Authority, Ministry of Planning, Building Palestine: Achievements and Challenges, Report of the Palestinian National Authority to the AHLC (13 April 2010),

at http://www.mop.gov.ps/new/web_files/publishing_file/PA%20AHL%20Report%20April%2013%202010.pdf. See also documents from the Mediterranean Climate Change Initiative, in which the PA participated, at <http://www.medclimatechangeinitiative.org/content/final-draft-joint-declaration-establishment-mediterranean-climate-change-initiative-now-onli>; the Joint Declaration (22 October 2010) is available at <http://www.medclimatechangeinitiative.org/sites/default/files/Joint-Declaration.pdf>.

^{ixv} See Palestinian National Authority (PA), The Palestinian National Early Recovery and Reconstruction Plan for Gaza (2009-2010), International Conference in Support of the Palestinian Economy for the Reconstruction of Gaza (Sharm El-Sheikh: 2 March 2009), at http://www.met.gov.ps/mnmodules/epapers/GERRP_Finalenglish.pdf; and The World Bank, Palestinian Economic Prospects: Gaza Recovery and West Bank Revival (8 June 2009), at <http://siteresources.worldbank.org/INTWESTBANKGAZA/Resources/AHLCJune09Reportfinal.pdf>.

^{ixvi} Distinguishing between risk assessment (“what is known about specific health risks”) and risk management (“actions to control...local risks under local circumstances), WHO says that “Comprehensive management of water quality, from catchment to consumer, is the most valuable preventive approach in the provision of safe drinking-water. This approach can be applied to any type of water supply – from a complex piped supply in a major city through to a village well. The guidelines recommend that this is through application of ‘water safety plans’”; WHO, Water for Health: WHO’s Guidelines for Drinking-Water Quality, at http://www.who.int/water_sanitation_health/dwq/waterforhealth.pdf; and WHO, Water Safety Plan Manual: Step-by-step risk management for drinking-water suppliers, at http://whqlibdoc.who.int/publications/2009/9789241562638_eng.pdf. For details see this document’s Action Plan, Section 1.5 (b) (iii) Water quality in public network.

^{ixvii} See the Action Plan’s section 1.2 PA commitments and targets to protect children from unsafe water and inadequate sanitation and achieve progress towards the MDGs (2010-2015), carried in each of the Plan’s five sections.

^{ixviii} See the Action Plan’s Section 1.5 (b) (i) Mapping and gold-standard comprehensive survey.

^{ixix} UN OCHA and WFP, Between the Fence and a Hard Place: Special Focus (August 2010), http://www.ochaopt.org/documents/ocha_opt_special_focus_2010_08_19_english.pdf.

^{ixx} Susanna Kruger and Julia Steets, IASC Cluster Approach Evaluation, 2nd Phase, Country Study—occupied Palestinian territory (April 2010), at <http://www.reliefweb.int/rw/rwb.nsf/db900SID/MCOI-863D4S?OpenDocument&rc=3&cc=pse>, p 7.

^{ixxi} WHO, Water, Sanitation and Hygiene Links to Health: Facts and Figures, at http://www.who.int/water_sanitation_health/publications/facts2004/en/index.html.

^{ixxii} Marwan Khawaja, The extraordinary decline in infant and childhood mortality among Palestinian refugees, *Social Science and Medicine* 58 (2004), at <http://prn.mcgill.ca/research/papers/khawaja-ssm.pdf>, p 469.

^{ixxiii} UNICEF, New UNICEF study shows MDGs for children can be reached faster with focus on most disadvantaged (Press Release: New York, 7 September 2010), at http://www.unicef.org/media/media_55913.html; UNICEF, Progress for Children: Achieving the MDGs with Equity (Number 9, September 2010), at

http://www.unicef.org/media/files/Progress_for_Children-No.9_EN_081710.pdf; UNICEF, Narrowing the Gaps to Meet the Goals; A special report on a new study by UNICEF shows that an equity-focused approach to child survival and development is the most practical and cost-effective way of meeting the health Millennium Development Goals for children (7 September 2010), at http://www.unicef.org/media/files/Narrowing_the_Gaps_to_Meet_the_Goals_090310_2a.pdf.

^{ixxiv} Susanna Kruger and Julia Steets, IASC Cluster Approach Evaluation, 2nd Phase, Country Study—occupied Palestinian territory (April 2010), at <http://www.reliefweb.int/rw/rwb.nsf/db900SID/MCOI-863D4S?OpenDocument&rc=3&cc=pse>, pp 23-26.

^{ixxv} For example, the Action Plan’s Section 1.2 Strategic Objective lists, “Protect children’s right to life, survival and development, and health through sustainable, safe and adequate water and sanitation”.

^{ixxvi} For example, from the Action Plan’s Section 2.0 concerned with the private water sector’s sale of filtered water, the Section 2.1 Strategic Objective is: “...and establish public confidence in the ability of authorities to improve the safety of vended water until they can meet safe water needs through the public network, monitor water safety and enforce regulation of the Gaza water sector as a whole”.

^{lxxvii} For example, from the Action Plan's Section 1.2 PA commitments and targets to protect children from unsafe water and inadequate sanitation and achieve progress towards the MDGs (2010-2015): Millennium Development Goal (MDG) 4, Target 4A: "Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate".

^{lxxviii} For example, from the Action Plan's Section 1.2 PA commitments and targets to protect children from unsafe water and inadequate sanitation and achieve progress towards the MDGs (2010-2015): World Fit for Children Goal 36 (d): "Reduction in the proportion of households without access to hygienic sanitation facilities and affordable and safe drinking water by at least one third".

^{lxxix} For example, from the Action Plan's Section 1.2 PA commitments and targets to protect children from unsafe water and inadequate sanitation and achieve progress towards the MDGs (2010-2015): PA PRDP: "Increase amount [sic] of households with access to piped drinking water to 95% by end of 2010; reduce system leakages to 10% by year 2010; increase volume and quality of water consumed to WHO recommended levels by end of 2010"; and PA MOH: The PHC Environment Department will "improve [the] water control program [targeting 90%] of families with access to clean water",^{lxxix} and along with the Directorate of Administration and Finance, will ensure "evidence-based control programs on quality assurance of ... [water and food] in place and functioning" by the end of 2010.

^{lxxx} See United Nations World Water Development Report Indicators, at http://www.unesco.org/water/wwap/wwdr/indicators/pdf/WWDR3_appendix_1.pdf (Appendix 1); and, for example, UNESCO's matrix for indicator development for Access to Safe Water, at http://www.unesco.org/water/wwap/wwdr/indicators/pdf/F4_Access_to_safe_drinking_water.pdf.

^{lxxxi} For example, under the Action Plan's Section 1.0 Protect children from unsafe water by ensuring sustainable access to safe and adequate water supply for drinking and domestic use and adequate sanitation: "Protect children from unsafe water by ensuring sustainable access to safe and adequate water supply for drinking and domestic use and adequate sanitation", Section 1.5 (a) Guidance lists, gives summaries, any Gaza references, and hyperlinks Five such references from Section 1.5 (a) Guidance are: WHO, Drinking Water Quality Guidelines; WHO, Water Safety Plan Manual: Step-by-step risk management for drinking-water suppliers; Network on Household Water Treatment and Safe Storage; The Sphere Project, Minimum Standards – Water, Sanitation and Hygiene Promotion and Palestinian Hydrology Group-WASH MP, Realizing Palestinian Water Rights: An Essential Step in Achieving the MDGs.

^{lxxxii} For example, under the Action Plan's Section 1.5 (b) "Priority responses to ensure access to sustainable, safe and adequate drinking and domestic water", six levels of project responses are listed (mapping, water quality at point of use, water quality in public network, supply augmentation and network extension, monitoring system, and fuel for the Gaza electricity plant). Specific projects for implementation are listed under each.

^{lxxxiii} Similar to Cluster or Sector project work, agencies operating under this Action Plan will convene under agreed leadership. The particular point applicable to each section reads, "Using the logframe as a structural base, the co-lead agency and ministry counterpart for this Section will oversee development of terms of reference, logframe, indicators and identification of measurable child outcomes and a common monitoring methodology. Agencies implementing projects in connection with this Section of the Action Plan will employ a common set of international and national norms and relevant good practice standards, protocols and guidelines, within the framework of international human rights and humanitarian law and core principles".

^{lxxxiv} Each of the Action Plan's five Sections carries a Risk Assessment sub-section: Section 1.0 risks include these three: "Data obtained in the course of project implementation indicate risk of exposure to chemical contamination (from nitrates, chlorides, fluoride, arsenic, other), especially of vulnerable infants, under-five children and pregnant and breastfeeding women"; "Materials, equipment and external experts and technicians required for implementation and maintenance of safe water and sanitation projects are prohibited by the Israeli blockade"; and "Governance issues between Gaza and Ramallah negatively affect necessary local ownership and exercise of duty-holder responsibilities, jeopardizing implementation and sustainability of water and sanitation projects".

^{lxxxv} UNICEF, Shifting from Behaviour Change Communication (BCC) to Communication for Development (C4D), workshop report (10 June 2010), at <http://www.unicef.org/oPt/>.

^{lxxxvi} UNDP, Programme of Assistance to the Palestinian People (UNDP/PAPP), Climate Change Adaptation Strategy for the Occupied Palestinian Territory, Final Report of Consultants to UNDP/PAPP

Initiative: Climate Change Adaptation and Programme of Action for the Palestinian Authority (December 2009), p 41.

^{lxxxvii} UNDP, Programme of Assistance to the Palestinian People (UNDP/PAPP), Climate Change Adaptation Strategy for the Occupied Palestinian Territory, Final Report of Consultants to UNDP/PAPP Initiative: Climate Change Adaptation and Programme of Action for the Palestinian Authority (December 2009), Figure 3.10, p 47.