Global Evaluation of UNICEF's Drinking Water Supply Programming in Rural Areas and Small Towns 2006–2016

Country case study report – Cambodia

Drafted by:
Bernard Collignon, HYDROCONSEIL
Marisa Gallegos, CGSWASH at Emory University
Kith Rathamony, Independent Consultant
Reviewed and edited by:
Jérémie Toubkiss, UNICEF Evaluation Office

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Acronyms

Acronym	Developed
CLTS	Community-Led Total Sanitation
GRET	Groupe de Recherche et d'Echanges Technologiques
IDPoor	Identification of Poor Households programme
JMP	WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation
MDG	Millennium Development Goal
NGO	Non-governmental organization
PDRD	Provincial Department of Rural Development
PPP	Public Private Partnership
RWS	Rural water supply
SDG	Sustainable Development Goal
UNDP	United Nations Development Programme
WASH	Water, sanitation and hygiene
WHO	World Health Organization
WSUG	Water and Sanitation User Group

A. Executive summary

A.1. Background and objectives

This country case study report is a component of the 'Global Evaluation of UNICEF's Drinking Water Supply Programming in Rural Areas and Small Towns', which was commissioned by the UNICEF Evaluation Office to assess UNICEF's experience and contributions in this area between 2006 and 2016. The global evaluation is informed by seven other country case studies, which all follow the same structure and methodology, and by additional sources of evidence, including a review of UNICEF and non-UNICEF documents and databases, a global online survey and semi-structured interviews with diverse sector stakeholders.

The country case study is not a full evaluation. It is less comprehensive in terms of scope, data collection and analysis. Its main objective is to feed into the global evaluation report by gathering information about UNICEF's programming in rural and small town water supply and the evolution of UNICEF's contribution to the sector at the country level. The case study also presents findings and recommendations that are intended to be useful to UNICEF Cambodia and its partners in-country.

A.2. Country context and evolution of UNICEF's WASH programming

Following more than two decades of strong economic growth, Cambodia attained lower-middle-income status as of 2015.[1] In 2015, 79% of the population lived in rural areas. The availability of water resources was generally high, with a dense network of water bodies (e.g. the Mekong River, the great lake of Tonlé Sap, etc.) fed by relatively heavy rainfalls. According to the World Health Organization (WHO)/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP), 69% of the rural Cambodian population had access to improved water in 2015, up from only 22% in 1990. Piped connections on premises increased from 0% to 7% over the same period. Despite the progress, one in three Cambodians in rural areas still lacked access to an improved water source as per the JMP definition in 2015. Indigenous ethnic minorities, who are primarily located in the north-eastern part of the country and represent approximately 10% of the Cambodian population, are particularly vulnerable due to socio-economic exclusion and comparatively poorer access to drinking water sources.

In rural communes, water services are organized under the Ministry of Rural Development with a community-based management system. Urban communes are regulated under the Ministry of Industry and Handicraft through a business licence management model. The (urban or rural) classification is not affected by the installation of piped water systems, and for this reason the Ministry of Industry and Handicraft, in agreement with the Ministry of Rural Development, also implements public-private partnership (PPP) contracts for piped systems in many rural communes. Further adding to the complex and fragmented context is the vast number of ministries within the Government of Cambodia that play a role in water and sanitation as well as the multiplicity of donors, non-governmental organizations (NGOs) and private operators active in the water sector with limited coordination. The decentralization process is still ongoing. Other

[1] The World Bank, 'The World Bank in Cambodia', October 2017, available at: www.worldbank.org/en/country/cambodia/overview#1, accessed 27 December 2017.

key challenges in the sector include: uneven institutional capacities especially at the decentralized level, arsenic contamination of groundwater in some areas, particularly along the Mekong River, the availability and use of unimproved water sources in rural areas and the prevalence of corruption.

UNICEF was one of the main implementing agencies in rural and small town water supply in Cambodia during the 1990s (including direct investment in wells until 2006) because other organizations were not active in the water, sanitation and hygiene (WASH) sector. UNICEF supported the water quality testing for arsenic following the 1999 assessment of the chemical quality of drinking water in Cambodia, which was conducted by the line ministries in charge of water with WHO support. Subsequent work on arsenic mapping, community messaging and educational campaigns at national and local levels, as well as contributions to the development of water quality standards and guidelines led by the Government and WHO, helped establish UNICEF's marker within the rural water sector. UNICEF shifted its focus to sanitation during the period under review, and intended to further engage in upstream work in addition to project implementation and support to provincial departments of rural development (PDRDs).

A.3. Main evaluation findings

Strengths	Weaknesses
Relevance	
• Considered (and appreciated) as one of the leading organizations in the rural water supply (RWS) sector, with special status as co-chair of the RWS, sanitation and hygiene technical working group since 2007 • Strong partnership with the Ministry of Rural Development, and UNICEF has high credibility in the sector • Main added value: works in rural areas, is active in all WASH sections (including sanitation, hygiene and humanitarian) and works on both upstream and downstream activities • Some relevant contributions to the sector, for example arsenic testing/mapping and community educational messaging, particularly at the beginning of the evaluation period	• Limited contribution to creating an enabling environment for the active and regulated involvement of the private sector in rural and small town water supply, which was supported by the Ministry of Industry and Handicraft rather than the Ministry of Rural Development, which was UNICEF's main partner during the evaluation period • Added value less clear when funding high-level NGOs that have their own strategies and other sources of funding • On some aspects, UNICEF's contributions too limited in scale/intensity compared to the needs of the RWS sector • Missed opportunity for UNICEF to use its credibility in the sector, as well as their coordination and convening role, to bridge divides and address fragmentation in the sector
Effectiveness	
• Effectiveness at reaching most programme targets during the period, including targets related to capacity-building activities • Significant investment in capacity building at all levels: central, sub-national (province/district/commune) and local water and sanitation user groups (WSUGs)	• Modest contribution to the achievement of the related Millennium Development Goal (MDG) (8% over 2006–2015) • Issues with water quality monitoring and treatment • Limited efforts in or effect of upstream work in terms of major changes in national policy or strategy

	• Lack of specific knowledge production and management targets set by UNICEF and modest investment in this area
Efficiency	
• Most efficient service option supported by UNICEF through its partnership with the Groupe de Recherche et d'Echanges Technologiques (GRET): piped water systems managed by private operators • Adjustments/improvements in partnership and procurement strategies and processes over time, with enhanced risk mitigation • Higher level of integration of UNICEF programmes in some periods and lower level of integration in others; recent trends towards more convergence/integration	• Level of cost-effectiveness of boreholes/wells and bottled water kiosk installation uncertain; requires further investigation • Lack of system to monitor/evaluate the efficiency of UNICEF's RWS programme, that of its partners, and of the three promoted RWS models
Sustainability	
• UNICEF support to a model that seems to show good results in terms of sustainability/financial viability: PPPs for the management of piped water supply systems • Improvement on the economic sustainability of bottling plants over time, supported by increased technology design, social marketing, training and follow-up support provided by the promoting NGO supported by UNICEF	• Unclear sustainability of WSUG-managed hand pumps • Approximately half of the bottling plants installed by Teuk Saat 1001 are still not 'self-sustainable' • Viability of more recent bottling plants supported by UNICEF in relatively richer provinces stronger (62% of plants profitable in Phnom Penh and Kampong Cham) than in poorer provinces (Battambang and Siem Reap) • Overall lack of data and in-depth evaluation on the sustainability of past RWS interventions and the financial viability of the promoted models to inform UNICEF's strategy and advocacy agenda in this area
Equity	
• Good visibility in the sector as an equity-focused agency • Two equity-lensed situation analyses carried out • Over time, clearer geographical focus on rural areas where water supplies are affected by arsenic contamination and more recently on and in remote communities • North-east Cambodia recently designated as a UNICEF geographical area of programmatic convergence • Subsidies offered to reach vulnerable rural households, including for deep boreholes in arsenic contamination areas and piped connections for Identification of Poor Households (IDPoor) card holders	• Unclear geographical targeting strategy leading to significant interventions in arsenic non-contaminated areas and other relatively better-off areas • The most disadvantaged north-eastern provinces not targeted by UNICEF until 2016 • Limited application or results of equity measures • Limited involvement of and accountability to community members, women and other vulnerable groups in the management of the RWS service supported by UNICEF at the local level (whoever owns/manages the service they use)

	• Lack of evidence that the most vulnerable areas and households within intervention communities benefit from UNICEF-supported interventions, especially the bottling plants • Room for stronger or more consistent pro-poor policy across all projects or at upstream (policy) level; making better use of the government-led IDPoor system, for example
Innovation and scaling up	
• Proactivity and some innovative measures to react to the arsenic contamination issue in the 2000s • Support to PPPs and small-sized bottling plants in rural areas and small towns • Support to pro-poor financial instruments • Promising innovation promoted by UNICEF: real-time service performance monitoring by customers using mobile phones	• UNICEF as a follower rather than a pioneer/sector broker • No engagement in accountability and regulation arrangements

A.4. Main recommendations

Cambodia has developed quickly over the past 10 years. With 70% of the rural population using improved water sources, the recent upgrade to middle-income status and a vibrant private sector engaging in the development and management of modern water supply services in rural areas, the country's challenges have changed. The objective of boosting the water supply coverage rate is being replaced with new objectives, including improving the quality of water supply services and reaching remaining communities and households still using improved water sources that are the poorest, most remote and most vulnerable. The technologies and skills for addressing these challenges are now largely locally available. The investment capacities of the Government, the private sector and households are becoming more significant, and, as a result, donors are reducing their financial aid to Cambodia. The role of external support agencies in Cambodia will therefore need to be adjusted accordingly to support the country's development in relevant ways with fewer resources. Now more than ever it is important for UNICEF to consider its added value going forward and its comparative advantage vis-à-vis other players, including the Government, development agencies, the numerous international and national NGOs and private entrepreneurs. In the WASH sector generally, and the RWS sector in particular, UNICEF will not be expected to implement large projects at scale. UNICEF is in the position to leverage resources and capacities, orient them where the needs are greatest and use them in the most relevant, efficient and sustainable way.

The Country Programme Action Plan 2016–2018 does not identify RWS as a priority area of WASH programming and does not propose a related indicator in the results framework. UNICEF's strategy and level of investment are therefore uncertain over the next few years. However, the Sustainable Development Goals (SDGs) impose an ambitious agenda for the sector: universal use of safely managed drinking water supply services by 2030. The Government of Cambodia has set its own target for universal access by 2025. In addition, in its new global strategy, UNICEF established a 'core accountability' for its WASH programming that "children and their families use a basic drinking water service and drink safe water at home". This

accountability commits UNICEF to act where children do not even have a basic level of service.[2] According to the latest JMP report published in 2017, in Cambodia almost one third of the population still does not use the basic level of service, and 15% of the rural population rely on untreated surface water for drinking, with a much higher rate in some regions. Only 16% of the rural population drink water that is free from contamination (i.e. faecal contamination, arsenic and fluoride).

The recommendations summarized below and developed at the end of the report propose a way forward for UNICEF, assuming it will aim to contribute to the country's progress towards the water supply SDG target and its own development agenda as well as to UNICEF's commitment to children and their families. Although they are presented in a structured and logical way, they should be considered as a menu of options rather than a plan of action. The most appropriate options for UNICEF will depend on numerous factors, including the dynamic in the sector, UNICEF's strategic vision for its assistance to the country, the resources at its disposal and the positioning of other RWS donors and stakeholders.

1. Analyse the sector context and UNICEF's comparative advantage and added value in a prospective way, looking 5 to 10 years into the future. On this basis, develop (or revisit) UNICEF's medium-term vision and associated theory of change for its RWS programming with the aim of making the best use of its limited resources. Three principles can guide the development of this formal, written vision and theory of change:
    - Focusing on UNICEF's niche in the sector;
    - Linking up (or strengthening the link between) the work supported by UNICEF in the field (downstream) and its agenda for strengthening the enabling environment for the sector (upstream);
    - Inducing or supporting transformational changes.
2. At the downstream level, determine which RWS service models and technologies are appropriate in which contexts and for which segment of the population and strengthen/refine them with the aim of enhancing their efficiency, sustainability and equity. Suggestions are proposed for piped network systems, bottled water plants and boreholes/wells as well as for supporting private initiatives and market-based approaches.
3. Revitalize the Communication for Development strategy and intensify related activities in the field.
4. Position the quality and sustainability of the service at the core of UNICEF's RWS programming and as an integral part of the models it promotes (particularly the PPPs).
5. Develop a comprehensive equity strategy for UNICEF or for the RWS/WASH sector more generally, covering all stages of the programming cycle.
    - Clarify the strategy for geographical targeting, in particular the relative criteria/weight given to equity, effectiveness and efficiency considerations. Whenever possible, focus on the areas where the highest number or proportion of households still use contaminated and untreated surface water;
    - Enforce/strengthen specific measures for poor and vulnerable households within intervention communities;
    - Make better use of the IDPoor system, including for situation analysis, monitoring and evaluation and policy advocacy.

[2] United Nations Children's Fund Programme Division, 'Strategy for Water, Sanitation and Hygiene 2016–2030', UNICEF, New York, August 2016.

6. Continue to advance integrated programming between RWS and other WASH interventions (i.e. Community-Led Total Sanitation (CLTS), WASH in institutions, etc.) as well as with other UNICEF non-WASH programmes (nutrition, health, education, early childhood development, etc.).
7. Develop an evidence generation and knowledge management plan for RWS in a collaborative manner.
8. Further strengthen or revitalize the existing partnership with the Ministry of Industry and Handicraft.

B. Overview of the global evaluation

B.1. Rationale and objectives

This country case study report is a component of the global evaluation of UNICEF's drinking water supply programming in rural areas and small towns between 2006 and 2016. The global evaluation was commissioned by the Evaluation Office at UNICEF Headquarters in New York. It was designed to assess UNICEF's experience with drinking water supply programming in rural areas and small towns to fill specific knowledge gaps, draw lessons and improve the appropriateness of UNICEF strategies globally and the quality of its programming in the field. In doing so, the evaluation will inform the development of the water, sanitation and hygiene (WASH) component of the UNICEF Strategic Plan 2018–2021 and guide UNICEF into the new Sustainable Development Goal (SDG) area. The evaluation also aims to contribute to global learning and promote UNICEF's accountability to internal and external stakeholders. It examines both downstream work in service delivery and upstream work in strengthening the enabling environment for the rural and small town water supply (RWS) sector at the national and global levels.

B.2. Evaluation design and criteria

The global evaluation is structured around six main evaluation criteria and six key evaluation questions listed in the first two columns of Table 1. The eight country case studies use the same six evaluation criteria and key evaluation questions. They form one component of the evidence base for the global evaluation, which also includes a review of UNICEF and non-UNICEF documents and databases, a global online survey and semi-structured interviews with a diversity of sector stakeholders. The areas of particular interest for the country case studies are listed in the third column of the table.

Table 1: Key evaluation questions and areas of interest for the country case studies

Criteria	Key global evaluation question	Areas of particular interest for country case studies
Relevance	Has UNICEF been a well-positioned, credible partner for national governments and major development agencies, demonstrating alignment and complementarity both globally and within countries?	• UNICEF's position in the field of drinking water supply in rural areas and small towns • The credibility, adaptation and complementarity of UNICEF's activities with those of its partners and of the other major in-country players
Effectiveness	To what extent has UNICEF a) achieved its global and country output and outcome level targets through quality programme implementation; and b) effectively contributed to the water-related Millennium Development Goal (MDG)?	• Achievement of output and outcome level targets in country and contributions to the MDGs • Success of policy advocacy, capacity building and knowledge generation/management activities • Quality of programme implementation

Efficiency	Has UNICEF maximized the costs-results relationship by systematically integrating efficiency considerations into its activities at global, regional and country levels, notably by promoting integrated programming and partnerships with other WASH and non-WASH initiatives?	• Relationship between costs and results • Use of cost-efficient approaches and measures, including engagement in integrating water supply interventions with other WASH (e.g. sanitation and hygiene) and non-WASH interventions
Equity	What has been the level of equity-sensitivity in the design, implementation and monitoring and evaluation of RWS activities at the global, regional and country levels?	• Geographical targeting at the country level • Equity-sensitivity of UNICEF RWS programming, including in monitoring and evaluation systems
Sustainability	Has UNICEF integrated appropriate measures and tools at all levels and achieved a satisfactory level of sustainability in its drinking water supply programming in rural areas?	• Evidence on the actual level of sustainability of past interventions • Extent to which the technical, financial, social, institutional and contextual factors known to support water supply sustainability have been taken into account in UNICEF's water supply programming • The sustainability lens in UNICEF monitoring and evaluation and information management systems
Innovation / upscaling	Has UNICEF been able to identify and test new programmatic approaches and take them to scale if successful?	• Private sector participation in the management of RWS services • Real-time monitoring • Sector regulation and accountability mechanisms • Innovative financial mechanisms to support access to the service

B.3. Country case studies' role

Country case studies are not country evaluations. They are used to document some but not all of the evaluation questions and indicators. The objective of the country case studies is to bring additional evidence from the country/field level and document some country specificities, feeding into the global evaluation report. At the same time, the evaluative country case study draws findings and makes recommendations intended to be useful at the country level.

B.4. Cambodia country case study methodology

This country case study focusses on the period 2006–2015.

B.4.1. Organization and data collection methods

The country visit took place in January/February 2017. See Annex 1 for the itinerary of the mission.

a) Semi-structured interviews and (focus) group discussions

Thirty-five semi-structured interviews were conducted in Phnom Penh, and 11 semi-structured interviews and focus group discussions were held in the field. They were carried out with UNICEF staff, key partners and beneficiaries, as well as with other RWS stakeholders at the local and national levels. See Annex 2 for a complete list of the stakeholders interviewed.

b) Field visits and meetings/interviews with local stakeholders

Field visits enabled the evaluation team to build a better understanding of the local context, interview local/sub-national stakeholders and private operators, obtain an overview of UNICEF interventions over the evaluation period, triangulate information from documents and interviews, and collect (limited) field data, particularly on sustainability and equity aspects. In each community visited, the evaluation team used a structured observation protocol, which included qualitative information such as pictures, videos and interviews with local stakeholders, community leaders and water users. Annex 3 provides a list of the specific sites that were visited.

c) National and sub-national workshops

The national and sub-national workshops were compressed into one workshop because the rural water sector is relatively small in Cambodia. The evaluation team used the workshop to collect opinions from a larger group of stakeholders to supplement the individual interviews and build consensus in the responses to the evaluation questions, or at least ensure triangulation.

The national workshop was attended by 34 people. Attendees included representatives from UNICEF, WHO, the French Development Agency, the Ministry of Rural Development (MRD), the Ministry of Industry and Handicraft (MIH), the Ministry of Health, PDRDs, NGOs and local private operators. Like UNICEF, these institutions have significant experience working on RWS in Cambodia. Individual participants were invited based on their familiarity with UNICEF programming and the RWS sector. Annex 4 provides the list of attendees, and Annex 5 provides the results of the survey conducted during the workshop.

d) Document review

A number of national government documents, national WASH sector documents and UNICEF public and internal documents were reviewed. These are listed in Annex 6.

e) Wrap-up meeting between the evaluation team and UNICEF Cambodia

A wrap-up meeting was held at the end of the country visit with representatives from the MRD and UNICEF Cambodia. The evaluation team presented the information collected to date and emerging key findings and general trends gleaned from the field visits, stakeholder/group interviews and workshops in order to gather and incorporate feedback.

f) Review of the draft country case study report

The draft country case study report was quality reviewed by both UNICEF Cambodia and the UNICEF Evaluation Office, and further edited by the Evaluation Office in coordination with the evaluation team before finalization.

B.4.2. Methodological limitations

Some documents and data were not accessible, particularly those on the earlier years of the period under review. In addition, some key informants were out of the country during the field visit. However, UNICEF Cambodia made every effort to help the evaluation team overcome these challenges by providing a number of useful documents and helping to organize Skype meetings.

C. Country specificities regarding RWS

C.1. Country context

Cambodia is located in south-east Asia and shares borders with Thailand to the west, the Lao People's Democratic Republic and Thailand to the north, the Gulf of Thailand to the south-west and Viet Nam to the east and the south. Cambodia has a tropical climate with two distinct seasons: a rainy season, which brings strong winds, high humidity and heavy rains; and a dry season, which brings little rain and cooler weather. In 2015, the total population of Cambodia was 15,243,309.[3] In 2015, an estimated 79% of the population lived in a rural area.[4] According to the United Nations Development Programme (UNDP), 13.5% of the population lives below the monetary poverty line, and the gross domestic product (GDP) per capita has grown over time (1,036 USD in 2015, compared with approximately 200 USD in 1992).[5] According to the World Bank, "Following more than two decades of strong economic growth, Cambodia has attained the lower-middle-income status as of 2015."[6]

C.2. Rural setting and minority issue

A large share of the national population remains dispersed due to the Khmer Rouge regime's aim to "establish a classless communist state based on a rural agrarian economy and a rejection of the free market and capitalism."[7] During the Khmer Rouge period from 1975 to 1979, millions of people from the cities were forced to work on communal farms in the countryside. Also unique to the Cambodian context is the fact that countryside villages are often built along a road, so there is no central gathering place, and there is thus a different understanding of the concept of community.

Indigenous ethnic minorities are numerous in Cambodia and are estimated to represent about 10% of the total population. They are also called 'hill tribes' or 'highlanders' because most of these populations live in the north-eastern provinces along the national borders of Viet Nam, the Lao People's Democratic Republic and Thailand, which are considered upland areas. These indigenous, non-Khmer peoples can be distinguished by their long-standing inhabitation of the remote upland forest areas but also by their distinctive religion, language and use of semi-nomadic agricultural techniques. They suffer from social isolation, discrimination and economic exclusion as well as comparatively poorer access to drinking water sources.

[3] 'Cambodge', PopulationData.net, available at: http://www.populationdata.net/pays/cambodge/, accessed 27 December 2017.
[4] The World Bank, 'Rural population (% of total population)', available at: http://data.worldbank.org/indicator/SP.RUR.TOTL.ZS, accessed 27 December 2017.
[5] United Nations Development Programme, 'About Cambodia', UNDP, available at: http://www.kh.undp.org/content/cambodia/en/home/countryinfo.html, accessed 27 December 2017.
[6] The World Bank, 'The World Bank in Cambodia', October 2017, available at: http://www.worldbank.org/en/country/cambodia/overview - 1, accessed 27 December 2017.
[7] 'Key facts on the Khmer Rouge', *Al Jazeera,* 3 February 2012, available at: http://www.aljazeera.com/indepth/features/2012/02/201223141554541 69.html, accessed 27 December 2017.

C.3. A fragmented institutional setup

An important distinction should be made between the rural and urban communes that make up Cambodia's 1,621 communes.[8] The formal criteria for differentiating between these two types of communes are based on population size and density as well as economic activities (e.g. electricity grid and petrol station). It should be noted that many impoverished urban communes are not small towns (small towns typically ranging from 2,000 to 20,000 inhabitants) and would be classified as villages in other countries—the houses are built in rows, with each approximately 25 meters from each other, along a dirt road. Moreover, the urban or rural classification is not affected by the installation of piped water systems, and for this reason the Ministry of Industry and Handicraft, in agreement with the Ministry of Rural Development, implements PPP contracts for piped systems in many rural communes.

Based on the national policy, the Ministry of Rural Development (MRD) is responsible for the development and supervision of water services in rural areas, which are typically organized around wells and boreholes and managed by WSUGs, while the Ministry of Industry and Handicraft (MIH) is responsible for urban areas, where two thirds of the population are connected to piped network systems. However, the MIH is also responsible for piped systems in rural areas because these schemes are considered a business or industry and have a corresponding business operating licence. Issuing licence contracts and licensing all water operators is a priority within the sector and is one of the main responsibilities of the MIH in regards to RWS. Based on the policy, the MRD's responsibility for RWS extends to water-bottling kiosks. When operated by private entrepreneurs, the operators must obtain a license from the MIH under the regulation pertaining to small and medium enterprises. The institutional setup is intricate and reportedly leads to some discussions and confusion regarding respective responsibilities.

Adding to the complexity is the vast number of ministries within the Government of Cambodia that play a role in water and sanitation and the multiplicity of donors and NGOs active in the water sector in the context of limited coordination. For example, according to a WaterAid report, "there are 11 government ministries with water related roles and responsibilities together with over 17 agencies and departments."[9] In addition to these ministries, there are provincial departments and districts that also have local water-related roles, and "Decentralization processes are ongoing but local government institutions remain weak, underfunded, under-capacitated, and understaffed."[10] The World Bank corroborates this statement, indicating in a report that a major development challenge in Cambodia is "weak public service delivery, which impedes inclusive development, ineffective management of land and natural resources, environmental sustainability, and good governance. Underlying the quality, adequacy, and efficiency of public services is the ability of the government to generate additional revenue for important public spending and investment requirements, to spend the available resources efficiently and accountably, and to ensure timely commitments and payments for the operation of vital public services and public investment."[11]

Finally, the coordination arrangements for water supply are sub-optimal. The Rural Water Supply, Sanitation and Hygiene Technical Working Group chaired by the MRD and co-chaired by

[8] Ninh, Kim and Roger Henke, 'Commune Councils in Cambodia: A national survey on their functions and performance, with a special focus on conflict resolution', The Asia Foundation, May 2005, available at: https://asiafoundation.org/resources/pdfs/CBCCSurvey.pdf, accessed 27 December 2017.
[9] WaterAid*, WASH, Water Resource Management and Water Security in Cambodia: Scoping study report,* WaterAid, 2012.
[10] Ibid.
[11] The World Bank, 'The World Bank in Cambodia', October 2017, available at: http://www.worldbank.org/en/country/cambodia/overview - 1, accessed 27 December 2017.

UNICEF brings together a number of donors involved in the sector but not all. Based on the 2014 revised decision letter for members, it is now supposed to involve other line ministries such as the MIH and the ministry in charge of water resources. NGOs are not members. Under the working group umbrella, there is a water and sanitation sub-group chaired by the Department of RWS (within the MRD), which serves as a forum for NGOs and other key stakeholders. There is a separate working group on urban WASH chaired by the MIH which involves other key WASH donors and stakeholders but not UNICEF. [12]

C.4. Private sector investment in RWS

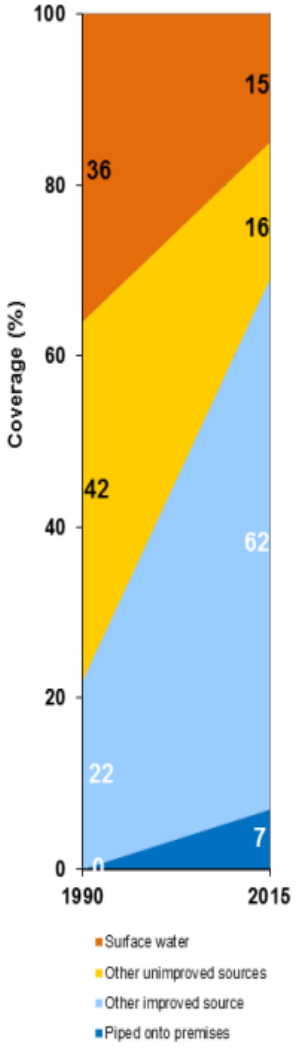
Hundreds of small piped water systems can be found in Cambodian villages and small towns as well as small rural communities. Water comes from surface water sources as well as from wells and boreholes. Many piped water systems have been designed, funded and built by local private investors with limited support and funding from NGOs, donors and the Government.

The local private sector has demonstrated a capacity to innovate, organize supply chains, meet customer demand and expand water service delivery in impoverished villages. From 2005 onwards, the MIH began to play a significant role in RWS, supporting private water systems developed through a private sector participation model to encourage and provide incentives to the private sector for improving services. Ten years later, it is estimated that some 500 piped water supply systems exist nationwide (with or without a license). The MIH issues a 20-year licence (previously of shorter duration), which is similar to a concession contract, where the private company or entrepreneur is responsible for the capital contribution and for connecting the majority of households living in the service area. The MIH oversees the facilitation of the PPP piped water systems (because the management model is a business) and the role of the MRD is to support conventional community organizations (WSUGs) to manage the boreholes and hand pumps.

[12] Members include: the French Development Agency, the Japan International Cooperation Agency and the Asian Development Bank.

C.5. Water resources and coverage

Figure 1: Trends in rural and total drinking water access in Cambodia from 1990–2015



***Source**: JMP, 2015*

The availability of water resources in Cambodia is generally high. The country is rich in rivers (dominated by the Mekong) and water bodies (including the great lake of Tonlé Sap), which are fed by relatively high rainfall.

According to the JMP, 69% of the rural Cambodian population had access to improved water in 2015, up from 22% in 1990, representing an annual growth rate of 1.5%[13] (*see Figure 1*). Piped connections on premises increased from 0% in 1990 to 7% in 2015, with accelerated rates of increase in recent years. This means, however, that one in three Cambodians in rural areas still lacks access to an improved water source, as per the JMP definition. These estimates also do not reflect the multiplicity of water sources concurrently used by households, particularly the poorest, who were observed using different water points based on their needs and (dry/rainy) season during the country case study.

There are an estimated 1 million small wells fitted with donated Afridev pumps or locally-made hand pumps in Cambodia. These interventions have helped increase access.

According to the 2015 JMP report, rural water coverage in Cambodia lagged behind coverage rates in most neighbouring countries. Out of nine countries in the region, Cambodia has the second lowest safe water coverage, and the proportion of households with access to safe drinking water increased only marginally during the evaluation period (from 49% in 2005 to 54% in 2013).[14] This suggests that the large RWS programmes implemented since 1980 (including those supported by UNICEF) and the public investment in the sector have not been sufficient to effectively provide access to clean water in relatively dense regions. This is particularly true in the Mekong Delta provinces.

C.6. Arsenic contamination of groundwater

Cambodia faces similar arsenic contamination challenges to Bangladesh, Viet Nam and Uttar Pradesh, India, as the sediment found along the Mekong River contains significant quantities of

[13] World Health Organization and United Nations Children's Fund, *Progress on Drinking Water, Sanitation and Hygiene: 2017 update and SDG baselines,* WHO and UNICEF, Geneva, 2017.
[14] Presentation of UNICEF Cambodia's water supply programming 2006-2016 (PowerPoint), UNICEF Bolivia, January 2017

arsenic. Arsenic is released when groundwater is abstracted and thousands of wells are contaminated, especially in the Cambodian districts bordering the Mekong River. This public health threat was not well documented before 2003, and arsenic remains a major issue for the RWS and is being dealt with by the Government (both the MRD and the MIH) as well as by communities along the river.

C.7. Institutional capacities and self-provision

In Cambodia, approximately half of the rural population reports fetching water from wells and boreholes.[15] In the Prey Veng Province, the PDRD estimates that there are as many as 70,000 private wells for a total rural population of 900,000 people. Although self-provision is a key RWS component (considering the percentage of serviced households), the evaluation team found no evidence of a strong (or even clear) policy for self-provision at the MRD level. The Ministry affirms an ambitious goal of "100% coverage by 2025," but has limited capacities (budget, human resources, technical capacity, etc.) to reach this goal. Unless capacities are strengthened, the Government's 2025 objective is unlikely to be achieved.

C.8. IDPoor card system

With support from the Government of Germany (the German International Development Bank and the German International Cooperation Agency), the Cambodian Ministry of Planning has implemented a system for identifying poor households (i.e. the two poorest quintiles of the rural population). This method consists of a community pre-identification exercise followed by a household income and asset survey. Each province conducts this procedure in order to facilitate increased access to public services every three years (through cash transfers and discounts), and households identified as poor are given an IDPoor card. This system is used by a number of programme sectors and could be an efficient tool for targeting the poor for specific activities (including in the WASH sector).

C.9. Corruption

Some financial partners (including the World Bank during the period of 2006–2009) were deterred from investing in the national budget due to the many identified cases of corruption, including in the WASH sector. This could explain UNICEF's reluctance to disburse significant funds to government counterparts and the strategy of directly implementing some WASH activities or using NGOs as implementing partners.

[15] Ministry of Planning National Institute of Statistics, 'Cambodia Socio-Economic Survey 2015', Phnom Penh, October 2016.

D. UNICEF RWS programme overview

UNICEF began to support the Government of Cambodia to build wells and boreholes in the early 1980s. Between 1983 and 1995, UNICEF supported the construction or rehabilitation of more than 12,000 of these boreholes (approximately 1,000 per year on average). UNICEF has continued this type of downstream intervention through the present day at a reduced but still significant pace of 400 boreholes per year until 2005, 300 per year until 2010 and fewer in recent years. UNICEF estimates that some 600,000 people gained access to an improved water source between 2006 and 2015 as a result of its support. This would represent approximately 8% of the total number of people that gained access in Cambodia over that period of time. However, this figure is based on a theoretical standard rather than an actual verified number of users per water point. Between 2011 and 2016, UNICEF spent a total of 2.3 million USD on RWS (less than 20% of total WASH expenditure). The timeframe under review was covered by two UNICEF country programme documents, and some changes occurred in its RWS programming between these two periods. These are briefly summarized in the table below.

Table 2: UNICEF Cambodia's RWS programming 2006-2015 at a glance

2006–2010[16]	2011–2015[17]
Integration: The Country Programme Action Plan 2006–2010 did not include a distinct "water supply" component (and at the time, the UNICEF branch in Phnom Penh had no water section), as water was considered to form part of one of the two components of the integrated *Seth Koma* programme (Community Action for Child Rights), which aimed to support the decentralization process and commune capacity building for planning and implementing local development plans, including activities in health, WASH in communities and schools, education and nutrition.	Separation: This refers to WASH as a standalone section in the UNICEF country office. The Country Programme Action Plan 2011–2015 includes a water supply component, focusing on water supply in arsenic-prone areas and open-defecation-free (ODF) activities. In the new Country Office structure for 2016–2018, WASH is placed under the child survival and development section as part of the Integrated Early Childhood Development programme.
Implementation mainly though the MRD UNICEF engaged PDRDs as implementing partners for RWS activities at the sub-national level, and largely contributed to building their capacities, with full-time staff based in the PDRD.	Implementation of construction work mainly through NGOs (GRET, Lien AID, Teuk Saat 1001, the Red Cross, etc.) with specific areas of interest and strategies/approaches and less direct engagement with the MRD/PDRDs.
Governance and corruption concerns, as well as internal funding and management changes during the 2006–2009 period, influenced UNICEF's new implementation approaches for the subsequent years.	
During the evaluation period, UNICEF supported the MRD to conduct arsenic mapping and customer awareness-raising campaigns. UNICEF funding was used on campaigns to paint boreholes in red/green based on arsenic testing.	

[16] The period of the UNICEF Country Programme Action Plan 2006–2010. Based on document review (notably country office annual reports), a PowerPoint presentation from the UNICEF WASH team, and interviews with programme stakeholders.
[17] The period of the UNICEF Country Programme Action Plan 2011–2015. Based on the same data sources as listed in footnote 16.

2006–2010[16]	2011–2015[17]
Focused on community and school water supply (rainwater harvesting) as a response to the arsenic contamination issue. A total of 412 boreholes were built and 425 were rehabilitated in communities. 70 hand-dug wells and two small-scale piped systems were also built.	Covered a wide range of types of service provision, including piped network systems, boreholes equipped with hand pumps, water bottling-plants, rainwater harvesting, WASH kits, safe household water treatment and storage promotion, and the construction of WASH facilities in schools.
RWS intervention in six provinces.	In arsenic-prone areas (six provinces, including three previously targeted and three new ones).
UNICEF's efforts on upstream activities (guidelines, sector regulation and sector platform) have fluctuated over time in accordance with integrated programming within UNICEF, funding and management. UNICEF has been co-chairing (with the MRD) the rural WASH working group for at least 10 years and is considered by the MRD to be its 'right hand'.	

E. Evaluation findings

E.1. Relevance

UNICEF's positioning, role, credibility, comparative advantage and added value in the RWS sector over the last 10 years

E.1.1. Strong credibility and added value

The interviews conducted during the country case study showed that UNICEF has benefited from a strong position and legitimacy throughout the evaluation period, which is acknowledged by the MRD as well as most donors and NGOs. UNICEF's reputation and credibility is built on the organization's funding capacity, long-standing presence in Cambodia's WASH sector[18] and collaboration with ministerial departments, including at the sub-national level, and its recognized focus on poor areas, communities/schools and children.

Respondents also agreed that UNICEF's added value was that it has worked and still works in rural areas and has carried out activities in all segments of the WASH sector (water, sanitation and hygiene). This means that UNICEF, as opposed to many other sector players, did not choose to focus on one type of WASH intervention only and generally included significant software activities such as community mobilization, sanitation and hygiene promotion, alongside hardware interventions. Furthermore, UNICEF's work on both downstream and upstream activities distinguishes it from NGOs or large donors such as the Government of Australia Department of Foreign Affairs and Trade or the Asian Development Bank, which generally work downstream, and WHO and the World Bank Water and Sanitation Programme, which generally focus on normative and enabling environment support activities.

E.1.2. Contribution to arsenic mitigation

In 2006–2010, UNICEF provided the MRD with relevant and timely support to identify all arsenic-contaminated wells in Cambodia. This large-scale water quality testing was UNICEF's key added value to the sector during the evaluation period, as tens of thousands of wells were tested and the following mitigation measures were subsequently taken by the Government, private service providers and households to preserve public health:

- Creation of the national groundwater arsenic contamination survey and mapping;
- Contribution to the WHO-funded development of guidelines and standards for water quality, as well as arsenic water quality standards (with a 50 parts per billion threshold);[19]
- Administering of a survey to understand the knowledge, attitude and behavioural patterns of families living in arsenic-affected areas;
- Development of a five-year strategic action plan in 2006/2007 and an updated version in 2009/2010;
- Information campaigns leading to greater community awareness of arsenic and water quality issues and increased customer demand for arsenic-free water (e.g. rainwater or treated surface water);

[18] UNICEF established a presence in Cambodia in the early 1980s after the Khmer Rouge fell from power.
[19] While this figure is considered high in other countries, it was determined suitable for the Mekong Valley context.

- National investment planning with specific investments/projects in arsenic-prone areas to provide alternative safe drinking water sources;
- The development of small piped water systems (more than 500 systems);
- Engagement with the private sector, specifically local private entrepreneurs, through NGOs, resulting in investment in and the installation of a high number of additional rural piped water systems financed and run directly by private operators;
- Other specific activities such as rainwater harvesting in schools implemented between 2006–2010, yet not at the scale or with the intensity required to meet the needs;
- Self-provision at the household level with hundreds of thousands of private wells.

UNICEF supported most of these actions. However, its investment capacity was too limited to allow for a level of scale-up or intensity that would meet all needs, and UNICEF did not continue to rally enough partners and sector stakeholders to tackle the issue together. As a result, the consumption of arsenic-contaminated water remains a problem in some areas 14 years after the issue was discovered.

According to the evaluation team, Cambodia's 2009 arsenic mitigation strategy was only partly relevant to the issue. Additional space for and engagement in decentralized, self-provision approaches could have effectively complemented the Government and donor/NGO-driven approach, given the following factors:

- Financial constraints faced by UNICEF and external support agencies more generally, and the need to mobilize additional sources of funding, including households' self-investment;
- Increased household awareness of the risk of arsenic, and willingness and ability to pay;
- Availability of water resources and of a market for self-supply options;
- Increased willingness and capacity of the local private sector to invest in the construction and management of piped water systems in rural areas and small towns;
- Enabling environment of private sector participation;
- UNICEF's engagement in and successes with the community-based, self-provision approach for rural sanitation (CLTS) that was evaluated by UNICEF in 2009.

E.1.3. Privileged but constraining collaboration with the Ministry of Rural Development

UNICEF has a privileged collaboration with the Government, especially with the MRD. As per its mandate, over the past 15 years UNICEF Cambodia has aligned its work with national RWS policies and strategies and supported their implementation at both the central and sub-national levels. The MRD and UNICEF have been co-chairing the rural WASH working group for at least 10 years, and UNICEF is considered the sector coordination leader. This puts UNICEF in a key position to gather strong knowledge of the sector and influence government policies and sector stakeholders.

In the context of the complex institutional setup for RWS and the discussions between the MRD and the MIH about their respective mandates, UNICEF's historically close relationship with the MRD may have posed a constraint to the establishment of an equally strong partnership with the MIH. Such a partnership would have put UNICEF in a better position to directly and more intensively support the extension of PPP models for piped water supply services in rural areas and small towns since the 1990s and for strengthening the enabling environment for the increased participation, monitoring and regulation of private service providers. Based on an analysis of sector coverage trends, stakeholder reports and field observations, this becomes

more critical as piped connections have become customers' preferred service delivery option in small towns, slums and a growing number of rural localities. Moreover, a stronger partnership with the MIH might have helped bridge the divide between the urban and rural WASH sectors and their respective stakeholders and dynamics.

To some extent, UNICEF could have taken greater advantage of its credibility, as well as its coordination and convening role, to address fragmentation issues, improve sector-wide strategic planning and learning, and maximize its contribution to the overall water supply sector.

E.1.4. Partnering with international NGOs

In the later years of the evaluation period, UNICEF selected international NGOs with significant technical expertise and good relationships with line ministries as its primary implementing partners for rural and small town water supply. These included GRET in 2003 and 2004 and since 2008 for piped water supply systems operated by licensed local private entrepreneurs;[20] Teuk Saat 1001 since 2011; and Lien Aid since 2013 for water bottling plants. UNICEF also signed a partnership agreement with the Cambodian Red Cross for the construction and rehabilitation of wells and boreholes.

The rationale for supporting water bottling plants and piped water supply systems was that some large rural communities and small towns are too small for the creation of public water authorities but too big for having only drilled water points and community-based management models; household demand and willingness to pay have significantly increased along with the economic growth; the interest and capacity of the private sector to meet this demand through modern technological options has increased; and the Government was willing to let private entrepreneurs invest in this business. GRET had previously established relatively stronger working relationships with the MIH and had the experience of supporting/installing piped water systems, obtaining licences and writing guidelines and standards. Teuk Saat 1001 and Lien Aid had their own technologies, implementing models and funding bases. The approach adopted by these NGOs, with modern technologies and support to private entrepreneurs, is very relevant to the Cambodian context. These partnerships were thus relevant for UNICEF and the sector in many ways. The international NGOs were essential to enriching UNICEF's RWS implementation models, progressively moving away from community-managed water points and expanding the reach and level of complexity of the UNICEF-supported RWS interventions.

However, the added value of UNICEF's support to these international NGOs is difficult to determine because these NGOs were already experienced and strong, with other sources of funding, and they typically followed their own agendas and strategies. Interviews with these partners indicate that UNICEF is generally perceived as a financial backer/donor that tops up other funding sources more than as a technical partner providing significant inputs or added value in terms of capacity building, guidance, programming tools, links with line ministries and coordination platforms.[21] UNICEF also did not support these NGOs with lessons learned from past experiences, from other implementing or sector partners, from studies/evaluations or from other countries where UNICEF supports similar activities.

E.1.5. Conclusion on relevance

Overall, UNICEF is viewed as a credible and well-positioned partner in the RWS sector. It made significant contributions to the identification/mapping of the arsenic contamination in the country

[20] Collaboration was initially conducted through the Ministry of Rural Development and later through a direct programme cooperation agreement between UNICEF and GRET.
[21] For the 2016–2018 country programme period, WASH engineers were recruited by UNICEF to assist with the technical supervision gap.

and to supporting mitigation measures. Its added value vis-à-vis the line ministries and other donors was significant but more modest vis-à-vis international NGOs. UNICEF could have made better use of its particular position and comparative advantage in the sector to maximize its added value.

E.2. Effectiveness

The degree to which UNICEF-funded programmes have produced the desired results through quality implementation, including in capacity building, policy advocacy and knowledge management

E.2.1. Uneven quality of implementation and water quality

According to UNICEF country office annual reports and reporting systems, individually-funded projects met their original targets over the evaluation period. UNICEF also made significant contributions to the main programmatic objectives of the RWS sector, although the UNICEF-supported arsenic mitigation strategy could have more appropriately and effectively tackled this serious public health issue through the promotion of improvements to wells, locally made hand pumps, water storage in large containers, spring protection and other self-supply approaches. In 2010, an estimated 50% of families living in UNICEF high-risk project areas were informed on arsenic contamination.

In terms of construction/implementation quality, the picture is mixed. Field observations and interviews with operators suggest that water bottling plants built by Teuk Saat 1001 and Lien Aid in the past three years are very well designed and in excellent condition. Although bottled water is treated, water quality testing/monitoring is carried out less frequently than planned by the local authorities. This is a serious issue because although it is the least-preferred option, a number of UNICEF-supported plants use groundwater sources that are prone to arsenic contamination, as opposed to arsenic-free surface water. Treatment units are not designed for arsenic removal and the few routine water quality tests reviewed by the evaluation team during field visits did not test for arsenic. Some bottling plants may therefore expose costumers to arsenic contamination currently or in the future.

Water treatment plants and piped network systems built by GRET were not always well designed or managed, especially with respect to water treatment. Some operators also did not have the capacity to interpret test results and adjust chlorine within the piped network accordingly or simply refused to chlorinate for fear that consumers would not buy water due to the taste. As a result, the quality of the water provided to the population was uneven. Arrangements for the supervision of well/borehole construction were sub-optimal, with no third-party engineering firm recruited for daily supervision; with PDRDs conducting spot checks at key moments using a checklist (borehole log sheet) and staff that are not engineers or technicians; and with only six-month liability/guarantee periods instead of the 12-month standard used in most countries. As a result, the observed construction quality varied: drainage was often absent or incomplete; many wells were said to have dried up; and in some cases, sand tests were absent and hand pumps were poorly fitted. The quality of the water from boreholes and wells was infrequently tested after the initial nationwide arsenic testing.

Supporting water quality at the point of source (piped connection and wells/boreholes) requires consistent safe handling and water storage at the household level. However, field observations and interviews suggest that awareness-raising campaigns were not always followed by the intended changes in household habits. The custom of storing drinking water in (often open) jars under the elevated floor of the house, where animals are kept and household economic activities

take place, represents a contamination risk. Ceramic filters provided by UNICEF as part of its emergency interventions or promoted as one of the household water treatment options were rarely found in use. Households and private operators also mentioned the cost and taste of treatment products as an obstacle (also documented in the 2016 GRET study on private water service providers[22]). These weaknesses in water quality, treatment practices and monitoring in UNICEF-supported interventions did not reflect the number of studies, guidelines and strategies supported by the organization in these areas.

E.2.2. Significant investment in capacity building

UNICEF-supported activities always involved the establishment of a management system and the training of user groups (for wells/boreholes, through PDRD) or private service providers (for bottling plants and piped system, through the international NGO partner). Training covered operation and maintenance, water quality, water use and improved hygiene practices (especially handwashing with soap and safe storage of household water) and was provided with a set of spare parts.

At the beginning of the decentralization process, under the *Seth Koma* programme, UNICEF invested considerably in developing the capacities of provinces and districts for planning, implementation, supervision and monitoring, involving representatives of women and children, etc. To help promote the role of the MRD and PDRDs in supporting commune councils in RWS and sanitation, UNICEF supported the development of a guideline and training module. Shortly after the arsenic issue was discovered, UNICEF trained a number of sector stakeholders at all levels on water quality testing, arsenic testing, household water treatment and safe storage. This support was widely appreciated but seems to have diminished in impact in recent years.

The main challenges reported by UNICEF include the absence of a sectoral operational plan, which has made it difficult to ensure that training and subsequent activities designed and planned at the national level are translated into action for children at local levels. Even more critical was ensuring consistent communication between provinces and the central level. Finally, the UNICEF Country Programme Document 2011–2015 highlighted that the historical presence of UNICEF programme staff in provincial government offices also led to a degree of capacity substitution. This presence has since been reduced.

E.2.3. No clear shift towards increased engagement in policy advocacy and knowledge generation/management

Based on country programme documents and self-reports from some UNICEF staff, the economic growth, the progressive development of national capacities (public and private sector) and the reduction in overseas development assistance to Cambodia encouraged a shift in UNICEF's programming from downstream to upstream work, including policy advocacy / formulation, guideline development, knowledge generation and management, and sector coordination. However, this shift did not clearly materialize in the period under review. Although UNICEF has continued to support initiatives in these areas, its support has not increased over time, relative to other donors or relative to the needs of the sector.

Throughout the evaluation period, UNICEF contributed technically and/or financially to the development of studies, strategies and guidelines for arsenic mitigation and water

[22] How have privately managed water supply systems in Cambodian small towns evolved? Key trends from 15 years of experience, GRET, 2016

treatment/safety.[23] Given that other organizations have supported initiatives related to the same topics, arsenic mitigation and water treatment/safety cannot really be described as UNICEF's niche in the sector. Moreover, UNICEF worked with the Asian Development Bank, the World Bank Water and Sanitation Programme, WHO, the Netherlands Development Organisation SNV, and NGOs to support the development of the National Strategic Plan for RWS, Sanitation and Hygiene 2014–2025, as well as programmatic guidelines.[24] However, these other organizations often took the lead on these initiatives,[25] though UNICEF may have had a comparative advantage as one of the few in the sector to be present at both downstream/field level and upstream/policy level and to work with multiple implementing partners with different service models and implementation approaches to RWS. UNICEF could have compared them against various criteria based on data provided by its implementing partners, generated relevant lessons for the sector and used them to inform policy advocacy/development. Existing studies/reviews on these models have been conducted by international NGO partners, and the results have not been consolidated. This limits the relevance for UNICEF of engaging with two different NGOs implementing the same type of intervention. It also creates a disconnect between UNICEF's supported work in the field and its contribution at the sector level.

Finally, the 2013 UNICEF WASH situation analysis pointed to the "need for clarifying the authority for water supply; strengthening the government's coordination, regulation and enabling role; improved regulation for the private sector; enforcing standards and parameters for safe water, testing, registration; [generating] more evidence to make the case for the sector in order to gain political support to secure large increases in funding; developing a multi-year operational plan of the strategy addressing key priorities; [putting in place a] consistent sector monitoring and evaluation process". Again, although UNICEF has a comparative advantage vis-à-vis other external support agencies in its ability to advance this agenda, this list of possible areas for study, review, cross-learning, institutional reform and coordination has not yet translated into action. It is understood that the fragmentation of the sector and the level of government leadership can certainly make these sector bottlenecks challenging to address. However, these should not be excuses for not developing an appropriate knowledge generation and advocacy plan in coordination with other sector stakeholders.

E.2.4. Conclusion on effectiveness

UNICEF invested significant resources, which generally resulted in positive results in the areas of water quality testing, water access and capacity building at the central, sub-national and local levels. Remaining challenges include the quality of construction and water treatment/water quality monitoring, especially for boreholes/wells and piped systems. UNICEF contributed to

[23] These include the five-year 'strategic action plan' for arsenic mitigation finalized in 2007 and its update in 2009–2010; an arsenic knowledge, attitude and practice survey and the arsenic mitigation study in 2009; the national guidelines for household water treatment and safe storage led by UNICEF in 2012; and the guidance for rural water safety planning, which received UNICEF technical and financial support in 2015 and 2016.
[24] These include RWS technical design guidelines and construction supervision in 2012, and WSUG and village focal point guidelines for RWS in 2015.
[25] For example, for WHO, the national microbial assessment of rural household point of consumption drinking water in 2013, the national rural drinking water quality guidelines 2015 and guidance for rural water safety planning in Cambodia in 2016; for SNV, RWS operation, maintenance and management in 2012, RWS technical design guidelines and construction supervision in 2015, water supply user group and village focal point guidelines for RWS in 2015, RWS inventory manual (in draft); for the Asian Development Bank: four studies on RWS operation and maintenance, community participation, gender mainstreaming, and water quality monitoring and testing in 2009; for the World Bank Water and Sanitation Programme, the study of options for safe water access in arsenic affected communities in Cambodia in 2012, review and development of the national WASH management information system (ongoing); and for GRET, the 2016 study 'How have privately managed water supply systems in Cambodian small towns evolved? Key trends from 15 years of experience'.

policy formulation and knowledge generation but not more than other external support agencies and not increasingly over time. Critical weaknesses and knowledge gaps have been identified in the sector and remain to date.

E.3. Efficiency

The degree to which UNICEF maximized the costs-results relationship by systematically integrating efficiency considerations into its programme design and management

E.3.1. Analysis of the various supported RWS service models

UNICEF has supported a range of RWS service options, which do not all have the same efficiency and do not equally meet all customers' needs and capacities to pay. As already mentioned, UNICEF has not analysed these options in a structured manner in order to compare respective costs, effectiveness and efficiency. This weakness led the evaluation team to carry out a brief comparative analysis summarized in the table below, based on limited field observations/interviews, document review and its own calculations.

Table 3: Comparative efficiency of water service provision options

Type of option	Brief efficiency analysis	Finding
Boreholes + Afridev hand pumps	• Efficiency is questionable in the most populated regions (Mekong Delta and alluvial plains) where there are hundreds of thousands of private wells. The added value of an additional well/borehole funded by public or UNICEF money is unclear. Users are typically limited to a few households located in close proximity. Moreover, a number of wells/boreholes reportedly dry up during the dry season and fall into disrepair. • Most public wells/boreholes are fitted with rather expensive Afridev pumps (500 USD each), despite there being easily accessible and cheap locally made hand pumps (12.5 USD each). Consequently, a significant percentage of communities replace Afridev pumps with cheap pumps when the Afridev pump breaks down. • Wells/boreholes supply water to very few households (between one and five households only), which results in high unit costs per beneficiary or per quantity of water used. The investment cost is estimated at 2,000-4,000 USD for one to five households (range: U400-4,000 USD per household, or 80-800 USD per capita). The number of users is likely to decrease over time as households seek a higher level of service and switch to piped systems whenever they can. • Considering the quality[26] of the water provided in relation to the investment cost: water quality monitoring rarely happens, and storing water in large (semi-) open jars is a common practice among households. Contamination	This technology option/service model is highly likely to be inefficient**.** A life-cycle cost analysis should be conducted, and the perspective (and financial contribution) of the various stakeholders involved should be taken into account.

[26] Defined as water that meets WHO and Cambodian guidelines.

	occurs within these storage containers and therefore threatens the health of households.	
Treatment plants and piped water systems[27]	• This technical option has an added value for households in terms of the quantity, quality and reliability of the water supply. • The proportion of households using the piped system within connected villages ranges from 30-72%, with a 52% average. The range of connected households within these villages is 200-3,000, with an estimated average of 2,000. • On average, the capital cost was 288 USD per household connected one year after (range: 70-500 USD; median: 219 USD; 44 USD per capita). This cost was supported almost equally by the private operators themselves (140 USD per household self-investment) and donors (148 USD external subsidy). From the perspective of the donors (including UNICEF) this is an efficient investment compared with wells/boreholes and given the significant leveraging effect of the external subsidy. • When taking into account the continuous investment of the private operator over time on the treatment facility and pipe extensions, this leveraging effect increased to 10:1 on average (10 USD invested by the operator for each dollar provided by the donor). From 643,590 USD of subsidies, private operators have invested more than 7 million USD. They have invested more than four times what was initially expected. • The capital investment cost for supplying 1 litre of water to one beneficiary is 1 USD on average.[28] • The average connection cost for households is 60 USD, and half this cost for IDPoor households benefiting from a connection subsidy, which is reasonable for a high level of service.[29] Supplying chlorinated water costs 0.5 to 0.6 USD per m^3 to the customer.[30] They often report (or were found) to not treat the water enough (or, in one case, too much), which is a concern in terms of public health and efficiency.[31]	Based on available data gathered by GRET over 15 years of investment and operation, this technology option/service model is generally efficient**.** A life-cycle cost analysis should be conducted.
Bottled water kiosks	• In the Country Programme Document period of 2011–2015, these were the largest UNICEF investment in	Based on Teuk Saat 1001 figures, the investment cost per

[27] Most figures are taken from the GRET 2016 study referenced earlier and in the Annex.
[28] Sevea, 'Access to drinking water in rural Cambodia', (unpublished draft dated May 2017).
[29] The cost charged to the beneficiary household ranges from 40 to 100 USD for a non-subsidized connection and 15 to 40 USD for a subsidized one, depending on the operator and the type of water source. Based on the GRET 2016 study and a dataset from 14 small water entrepreneurs licensed by the Ministry of Industry and Handicraft.
[30] Ranging from 0.45 to 0.75 USD/m^3, based on the GRET 2016 study; the report: Sevea, 'Access to drinking water in rural Cambodia' (unpublished draft dated May 2017); the dataset from 14 small water entrepreneurs; and triangulated with interviews with private operators.
[31] Some service providers did not have the capacity to adjust chlorine within the piped network. According to the observed water quality results, one service operator had a chlorine level of 11 milligrams per litre in the system. He could not interpret the results or adjust accordingly. Another service provider reported "I am afraid to add chlorine because users will complain about the taste", so the system remains unchlorinated and the safety of the water is not guaranteed.

	RWS. They provide a limited quantity of high quality water. • The cost of a bottling plant is estimated at between 25,000 and 30,000 USD, funded by donors.[32] According to data provided by Teuk Saat on UNICEF-supported plants in the Phnom Penh and Kampong Chang provinces, the average number of beneficiaries is 2,000 people per plant per village, with a penetration rate of 19% (in 2016). The capital investment cost is 12.5 to 15 USD per beneficiary, which is very reasonable.[33] • Datasets and reports show that the quantity of bottled water delivered to customer households is limited. Given its cost and the limited capacity to pay of households in rural areas and small towns, bottled water is typically used for drinking purposes only, by a limited percentage of households, and not consistently over time. It is typically used in conjunction with other, less improved water sources (especially during the rainy season), and therefore only partly meets the needs of consumers. [34] • Factoring the limited quantity of water supplied to customer households in this efficiency analysis, the capital investment cost for supplying 1 litre of water to one beneficiary is 6 USD on average, six times more than for piped water schemes.[35] • The average sale price is very high (16 USD per m^3), especially compared with piped schemes (29 times cheaper for the customer), although it does not incorporate the bottling plant depreciation cost. [36]	beneficiary supported by the external agency (NGO/UNICEF) is significantly lower than for piped schemes. However, the cost for the consumer is significantly higher. A more detailed inter- and intra-annual analysis of the efficiency and value for money of this technology option is required, in addition to a life cycle cost analysis.

As highlighted above, UNICEF has no clear strategy regarding low-cost options and rural water self-provision, although it promoted this strategy in rural sanitation through the CLTS approach.

E.3.2. Partnership and procurement strategy and management improved over time

The UNICEF Cambodia partnership strategy evolved during the evaluation period. Until 2010, UNICEF worked mainly through government partners, including for construction and supervision activities, transferring funds to partners using direct cash transfers. Government partners were responsible for procuring goods and services with support and oversight from UNICEF. The

[32] PCA documents signed by UNICEF with Lien Aid and Teuk Saat 1001 in 2014 and 2015

[33] Based on data provided by Teuk Saat and Lien Aid.

[34] See: 1001 Fontaines, *Cambodia Economic Sustainability Report 2016;* associated primary financial data on 86 UNICEF-supported bottling plants in Phnom Penh and Kampong Chan provinces; and Hutchens, C., D. White and B. Antizar Ladislao, 'Is Bottled Water Affordable for the Poorest in Rural Cambodia?', Changing Course: Global Engineering Education Conference Proceedings, London, 26 March 2012, available at: www.research.ed.ac.uk/portal/files/8750959/2012_EWB_Hutchens_White_Antizar_Ladislao_Final.pdf, accessed 31 January 2018. This was confirmed by field visits: at the three bottling plants visited, average sales were 70 to 110 bottles per day on average (one bottle per client household), not enough to meet the water needs of the 2,000 households within these villages.

[35] Sevea, 'Access to drinking water in rural Cambodia', (unpublished draft dated May 2017).

[36] Based on field interviews and the report: 'Access to drinking water in rural Cambodia', Sevea (unpublished draft dated May 2017).

Government's sub-contracting arrangement between provincial line departments, communes and horizontal administrative authorities was aligned with the decentralization process.

When the Harmonized Approach to Cash Transfer reform was introduced at UNICEF Cambodia in 2007 (earlier than for most other UNICEF country offices), the lack of a direct cooperation agreement with the provincial authorities proved to be a constraint to accelerating procurement activities for arsenic mitigation.[37] Using sub-national planning and budgeting systems that were not functioning effectively was also identified as a challenge.[38] Finally, the corruption issue raised by the World Bank in 2007 and involving several institutions/people within the Government of Cambodia, including in the WASH sector, also likely encouraged UNICEF to revise its partnership strategy. The internal mid-term review of 2013 advised that UNICEF move away from procurement through government systems to internal procurement.

Since 2011/13, UNICEF has partnered with the above-mentioned NGOs through programme cooperation agreements for most programme activities. Procurement of goods and services was the responsibility of these partner NGOs, or conducted directly by UNICEF, to mitigate financial risks and improve efficiency.[39] Government partners received earmarked funds from UNICEF or partner NGOs for supervision, training and water quality testing activities. An adjustment phase was necessary for UNICEF staff to master the "complexity of contracting for service [which] can create delays in programme delivery and possibly the loss of funds".[40] The Harmonized Approach to Cash Transfer was also reported to have contributed to improving risk management, field monitoring and partnership efficiency, though less so capacity building of implementing partners. The evaluation team found no evidence that UNICEF Cambodia monitored costs, quality and risks in a way that could have validated the hypothesis of enhanced efficiency, however. Data were not gathered to compare efficiencies between the Government and NGO partners, or between various NGO partners, or with other non-UNICEF RWS donors and interventions.

E.3.3. Uneven geographical convergence and programmatic integration

Since at least the early 2000s, UNICEF intended to focus its interventions on a limited number of priority provinces and seek programme synergies to improve organizational and programmatic efficiency. In practice, the WASH programme has undergone alternating periods of integration/separation with other UNICEF programmes, as summarized briefly in Section D, and with varying (and overall uncertain) levels of success.

Although the *Seth Koma* programme (2006–2010) was conceived as an integrated, multi-component programme, with water supply, sanitation, WASH in schools and other non-UNICEF interventions, a health and nutrition section continued to exist separately from *Seth Koma*. This created a divide within the office structure and limited the extent of programme integration.[41] As the budget for WASH increased, the programme was subsequently upgraded to a standalone section within the office. This reportedly reduced the level of programmatic integration until 2015, including within WASH, as reflected in the mapping of WASH intervention areas and the result

[37] *UNICEF Annual Report 2007 – Cambodia,* UNICEF, 2008.
[38] *UNICEF Annual Report 2008 – Cambodia,* UNICEF, 2009.
[39] It was also among the findings and recommendations of the 2013 mid-term review.
[40] *UNICEF Annual Report 2013 – Cambodia,* UNICEF, 2014.
[41] However, the 2005 Country Programme Document evaluation found that "Ambitions spelled out in the MPO as to focus, convergence and integration have not entirely materialized in the current programme... While there are several examples of convergence and integration at the level of concrete project initiatives, there is still relatively limited convergence at the level of the various programme components. Especially the Seth Koma Programme has so far not lived up to its potential to be an integrative force, as there has been a certain "disconnect" between Seth Koma and other programme activities at the decentralized level (especially related to health and nutrition)."

matrix. In 2015/16, a new multiple overlapping deprivation analysis, country programme document, office structure and areas of convergence were established to support integrated programming and address the following identified challenges:

- Increasing access to and utilization of quality health services, early childhood education, basic education, WASH and social protection services by poor, vulnerable and marginalized people;
- Enhancing complementarity among sector policy initiatives; and
- Institutionalizing multi-sector planning, delivery and monitoring of child-centred social services, particularly at sub-national levels.

Based on UNICEF annual reports and interviews with senior management staff, this organizational and programmatic evolution was reportedly motivated by Cambodia's upgrade to middle-income status, as well as the prospect of a significant decrease in donor funding and the resulting need to make the best use of available/future resources. Despite commitments within UNICEF Cambodia, the strong push from senior management and support from a senior official within the Government, the evaluation team did not find evidence that UNICEF's WASH/RWS programming had started to work in a more closely coordinated/integrated manner with other programmes in the field and in the same villages on the basis of joint theories of change, donor proposals, partnership strategies, implementation modalities and a well-thought sequencing of activities in the field. However, a WASH-nutrition theory of change has been drafted, some priority areas in the country have been selected for increased geographical convergence (north-eastern provinces) and a study is ongoing to test an integrated intervention package and build evidence on the effectiveness, impact and efficiency of this approach. Overall, what strikes when looking at UNICEF RWS intervention areas from 2006 to 2016 is the geographical spread, overall dispersion and successive changes over time (*see Annex 8.1 and 8.2 maps*). The study results may guide the country office towards increased integrated programming in the coming years.

Divergent opinions about integrated programming were expressed, however. Some UNICEF staff felt that integrated programming fosters greater efficiency by reducing operational costs and maximizing outcomes and impacts among beneficiaries. Others highlighted that needs for RWS, sanitation, nutrition, health or education interventions are not necessarily located in the same geographical areas (*see Annex 8.3 maps*); bridging silos between ministerial departments and donor focus areas is a challenge; and integrated programming leads to additional meetings and administrative issues. One UNICEF staff member interviewed said, "When projects are integrated it is difficult to engage in fundraising and do real WASH advocacy work because it is just part of a lot of other things […] It is difficult to coordinate with other partners, when internal UNICEF integration is not happening. There is a need for more evidence to see what is more efficient."

E.3.4. Conclusion on efficiency

UNICEF has been able to adapt and strengthen its strategy and procedures for partnerships and procurement over time. It has recently committed to increased geographical convergence and integrated programming and building the case for this, in reaction to previously sub-optimal levels of integration not only between WASH and other sections in UNICEF but also within WASH. These positive evolutions are likely to have enhanced programme efficiency. However, UNICEF has monitored efficiency neither in its own programming nor within its implementing partners' interventions, making it impossible to support this assumption with evidence and to harmonize diverging views on the topic. The limited data available suggest that piped water systems are the most efficient model in UNICEF's RWS portfolio of approaches. The efficiency of bottling plants is more uncertain and likely to be weak for boreholes/wells.

E.4. Sustainability

UNICEF's contribution to RWS sector strengthening and sustainable services

E.4.1. WSUGs and boreholes/wells equipped with hand pumps

In 2009, the UNICEF WASH situation analysis revealed that "thousands of water points were built in the 1990s and well into this decade without villager input, with no user education, no toolkit and often no spare parts. Most funding went for new wells or water points. There are still wells being drilled and dug without collaboration with the Government and the commune, and without the formation and training of a WSUG. The WSUG meeting (10 males and 32 females) held in this community reported only five of the 15 wells in the village were operating. The MRD team estimates a maximum of 30% of WSUGs may have money in the operation and maintenance boxes. Spot field observations did not see this level of success." Although this testimony did not necessarily apply to UNICEF-supported water points, it gives an idea of the lack of attention given to the sustainability challenge in the sector prior to the evaluation period. In contrast, after 2006, all UNICEF-supported wells/boreholes were installed by or in close collaboration with the Government with hygiene education and a trained and equipped WSUG. Two major issues remain, however.

First, villagers do not actively participate in the designed WSUGs or always share operation and maintenance costs. Based on field observations and stakeholder reports, the boreholes built or rehabilitated by the Red Cross (with UNICEF funding) in 2013–2014 are currently used by the household that provided the land where the borehole was installed and a few households located nearby. In these cases, boreholes have essentially become privately managed. Household contributions are collected on a case-by-case basis whenever a spare part needs to be repaired or replaced. Therefore, the environment for community-led management of public hand pumps does not exist, and the sustained number of beneficiaries drops very quickly after the installation of the water point.[42]

Second, data on RWS sustainability and more particularly on the functionality rate of hand pumps is lacking. Only one study was mentioned (conducted by SNV with a limited geographical scope), and none were conducted or supported by UNICEF. The UNICEF-funded installation of robust hand pumps on new boreholes (the Afridev model made in India)[43] is in line with the recommendations of the '2015 Rural Water Supply Technical Design Guidelines and Construction Supervision'.[44] Although these pumps are robust, they can break down and repairs are considered expensive by villagers who prefer to replace them with cheaper, locally made pumps. In addition, as the country's economy grows and piped network systems expand geographically, fewer people will use hand pumps, and the sustainability of the hand pump supply chain will become uncertain.

While the public hand pump model (infrastructure and management arrangement) may have been relevant after the Khmer Rouge period, given the groundwater contamination by arsenic in parts of the country, reconsideration is now urgently required of the emerging demand for a higher level of service and the more recent experience with private operators. For these reasons, the sustainability of this model has become questionable and requires further investigation by the sector as a whole. UNICEF Cambodia, with its long-standing experience in this area of work,

[42] PDRDs and UNICEF Cambodia argued that this individual appropriation of public wells/boreholes is a relevant arrangement for making service provision sustainable because they become the responsibility of a single person rather than a diluted responsibility. However, this still raises an issue in terms of cost-effectiveness and equity.
[43] According to PDRDs, potentially fake Afridev pumps are also sold on the local market.
[44] Developed by the Ministry of Rural Development and SNV in 2015.

could have played a leading role, possibly with the support of UNICEF Headquarters, for which sustainability has become a programmatic priority over the past five to seven years.

E.4.2. Piped water systems

PPP arrangements (licences for and investment and management by private operators) provide strong incentives for sustainably managing piped water systems. This is especially the case for the new 20-year licences – an extended period granted by the MIH to support investment by the operator and ease return on investment. The model works because a private company invests its own money in the system and is fully responsible for system operation and maintenance and capital replacement (the licence with the MIH is similar to a concession contract). It is estimated that there are now more than 300 individual operators and 500 PPPs in rural areas and small towns, including more than 160 (and growing) where the service provider has a formal licence with the MIH. In 2011, these private operators provided water to some 200,000 households.[45]

Since 2013, UNICEF has financially supported GRET with conventional facility construction (such as treatment plants and water storage) and connection subsidies for poor households as well as innovative software project components such as real-time monitoring, which has been under development since 2016. Partial, indicative information suggests that this model is likely to be technically and financially viable and adequately distributes risk between contract partners:

- More than 80% of the 22 private water service providers supported by GRET over the past 15 years are still active. The average duration in business is 10 years. Two have sold their businesses and one faced bankruptcy.[46]
- Most private operators have supported operation and maintenance costs, improved and extended their system, or even invested in a second system using their own money.
- Competition is fierce among potential operators (including paying bribes to obtain the licences).
- The Government initially encouraged private entrepreneurs to invest ('laissez-faire') and still supports them by granting a monopoly in their service area and not imposing significant quality standards or supervision and regulation mechanisms.

The main sustainability/financial viability constraints identified by GRET and informants interviewed were the following:

- Variable availability of the water resource to meet the local demand and increase the consumer base by extending the network;
- In piped villages, only 50% of the potential consumer base is served, and connected households continue to use other sources of water. The demand is mainly restricted by the water tariff (vs. free water from wells/boreholes and rainwater harvesting) and the connection fee when not subsidized. More investment in continuous, multi-channel awareness-raising activities was requested by the operators interviewed to increase household connections and water consumption.
- Water quality is uneven among service providers as treatment requirements for surface water are complex and technical capacities are lacking.

[45] Frenoux, Clément, 'Déterminants et performances des services non conventionnels d'approvisionnement en eau dans les villes en développement. Le cas des entrepreneurs privés locaux dans les petits centres urbains du Cambodge', Ph.D. thesis, Université de Toulouse, 2016.
[46] According to the study: How have privately managed water supply systems in Cambodian small towns evolved? Key trends from 15 years of experience, GRET, 2016.

  - The technical and managerial capacity of operators is weak as they often have no previous experience with the management of a water service.
- The lack of involvement/support from communes, which is partly due to the weak ownership and decentralization process.
- The challenge of capital replacement. Profitability in the water supply business takes time given the level of capital investment and the tariff constraints. Therefore, data on the financial and technical sustainability will become more meaningful after the first round of capital replacement.

E.4.3. Water-bottling kiosks

There are a large number of small water bottling plants in Cambodia. Most of these bottling plants are considered to provide safe water for urban dwellers.[47] The majority of these plants sell 20 litre containers/bottles filled with treated water (from groundwater or surface water). The market price is 3,000 Riel (0.75 USD) per 20 litres, and the business is sustainable, as it was developed by private investors to serve a specific market niche: urban middle- and upper-class households as well as poorer households that do not trust the quality of tap water.

UNICEF has been funding small bottling plants in rural areas and small towns of Cambodia since 2012. These plants were implemented by Teuk Saat 1001 and Lien Aid, with the aim of providing smaller rural communities (communities that are not covered by a piped water system) with the same service quality as in other, more privileged areas.

Both NGOs have developed a management model based on asset ownership by the commune as well as service management by a local private operator. The tariff is lower than in urban areas (between 1,000 and 1,500 Riel per bottle[48]) but remains expensive for the poorest households (*see section on Equity below*). For this reason, the customer base is generally limited: 19% of the village population according to data provided by Teuk Saat 1001 (5 to 15% based on interviews with a few operators). The customer base has slowly increased over the years. At the current tariff, the volume of sales (annual average of 85 bottles per day based on Teuk Saat data, confirmed by interviews conducted in the three production units visited in the field) remains hardly sufficient for the revenue to cover operation and maintenance costs. As a result, existing financial monitoring data provided by the NGOs and the business plan re-constructed by the evaluation team (*see Annex 9*) both indicate a very thin profitability margin. Thirty-eight per cent of UNICEF-supported Teuk Saat bottling plants located in the relatively wealthier provinces of Phnom Penh and Kampong Chan recorded a loss for the year 2016[49] and are considered 'not (yet) self-sustainable' by Teuk Saat (higher figure when adding plants located in the relatively poorer provinces and not supported by UNICEF). Teuk Saat considers any entrepreneur who, once all costs paid, can serve himself/herself a monthly income greater than 150 USD to be financially self-sustainable. As a result, the business model is vulnerable to any external changes/shocks that may affect the condition of the facility, the operating costs or the user demand. This can explain the turnover of operators. Out of 16 plants built by Lien Aid with UNICEF support, five operators resigned. Exact data are not available for Teuk Saat, but the turnover rate and cases of service disruption are reported to have declined since 2012 due to investments in training and follow-up support.

[47] The evaluation team did not test the quality of the water so cannot indicate whether the water is safe for users.

[48] Sources for this paragraph on Teuk Saat are: 1001 Fontaines, *Cambodia Economic Sustainability Report 2016*, and associated primary financial data on 86 UNICEF-supported bottling plants in Phnom Penh and Kampong Chan provinces.

[49] Investment expenses are included in the calculation.

The 'survival rate' is 99% for the most recent plants created by Teuk Saat (after 2012 and mainly located in the relatively richer provinces), and 61% for the older ones (2005–2011, in relatively poorer provinces). This may also indicate that the model has been improved over time. A report published by the NGO points to several improvements introduced in 2011/2012: refined technology design, increased emphasis on social marketing activities and more training and follow-up support provided by the NGO to the operators. The fact that the 'survival' rate is higher than the 'self-sustainability' rate suggests that some operators have remained in business because they received external subsidies: either from the NGO (both Lien Aid and Teuk Saat pay for 15 to 25% of the bottled water produced at the plants to be delivered free to schools, and provide some supplies, trainings and supervision) and from other family members/businesses.

The rapid financial sustainability analysis above does not take amortization costs into account. Local authorities are not asked or expected to support the capital replacement costs, and given the above mentioned profitability rate it is not yet certain whether the operators will be able to do it without the support of the NGO or donors once the plant will have reached an age where some of its major components will need to be replaced. Teuk Saat 1001 actually committed to cover all replacement costs in exchange for 25% of the operators' annual profit.[50] Given the very limited annual profit, this financial commitment represents a very significant level of external subsidy. It raises the question of whether the model can be sustained in the long-term without external support. Overall, the long-term financial viability may largely depend on the ability of operators to rapidly raise the demand and the tariff along with the country's economic and social development, on the life expectancy of the infrastructure, and whether capital replacement will take place before the break-even point.[51] A more refined life cycle cost analysis is needed, based on a statistically representative sample of sites in various operating contexts. It would need to take into account the operation and maintenance and capital amortization/replacement costs on the one hand, and the anticipated gradual increase in the demand and willingness to pay of rural and small town households for such level of service on the other.

E.4.4. Conclusion on sustainability

UNICEF has not engaged sufficiently in monitoring, evidence generation and policy advocacy for sustainability given the needs in the sector and compared with UNICEF RWS programmes in other countries. Sector studies and guidelines on operation and maintenance, community participation, etc. have not been supported by UNICEF but by other donors. The community members, communes and technical ministerial departments are only marginally involved in intervention design, planning and implementation, despite UNICEF's strong experience in community mobilization, supporting the decentralization process and nurturing strong alliances with line ministries. Accountability and regulation mechanisms have not been promoted. Among the three RWS models UNICEF supported in Cambodia, the limited evidence available indicates that only one model, supported since 2013, clearly demonstrates full operation and maintenance cost recovery and long-term financial viability. The WSUG needs to be reconsidered or revamped, and the long-term viability of water bottling plants need to be further investigated.

[50] Based on interviews with Teuk Saat senior management staff.

[51] This echoes the findings of the report: Sevea, 'Access to drinking water in rural Cambodia', (unpublished draft dated May 2017 and provided by Teuk Saat).

E.5. Equity

UNICEF's consideration for the population groups most in need in its geographical and beneficiary targeting, programme design and implementation (both downstream and upstream) and in monitoring and evaluation

E.5.1. Equity-focused situation analysis but unclear geographical targeting strategy

In 2009, UNICEF commissioned an equity and gender-lensed situation analysis. More recently in 2016, it commissioned a multiple overlapping deprivation analysis to examine the geographical convergence of water, sanitation, nutrition, health, education/early childhood development and housing. These were reportedly used to inform the new country programme and guide geographical targeting. According to the WASH section, the main targeting criteria for 2006–2015 were the following:

- Provinces and communes with high arsenic contamination levels;
- High percentage/number of families that use well water in the communes;
- Communes in challenging environments, i.e. facing water shortage or quality issues (i.e. Chantrea District in Svay Rieng Province);
- Communes where there were no existing UNICEF-supported systems;
- Communes where there were no licensed piped water supply systems and/or systems were in the process of gaining a licence.

These criteria are highly relevant, especially in regards to arsenic-contaminated areas, which turned out to pose a considerable public health issue in the country. However, mapping these various parameters and comparing these maps with UNICEF RWS intervention areas since 2006 reveals a more nuanced reality (*see Annex 8*).

The six UNICEF-targeted areas within the *Seth Koma* programme (through 2010) were not those most affected by arsenic in groundwater. UNICEF only moved to three of the most affected areas in 2011, while continuing to intervene in other less/non-affected ones. This does not necessarily mean that selecting other areas was not relevant from an equity perspective: their selection could have been driven by the other parameters listed above or other meaningful parameters. Yet, again, the mapping exercise demonstrates that this may not have been the case. UNICEF intervention provinces throughout the evaluation period were not the ones with the lowest water coverage: Kep, Banteay Meanchey and Koh Kong provinces, in the south, north-west and south-west of the country (19%, 28%, and 42% coverage, respectively, against a national average of 62%).[52] Until 2010, UNICEF's intervention areas even included three of the provinces with the highest water coverage: Stung Treng, Svay Rieng and Prey Veng. Only one intervention province in the north-east (Stung Treng) was among those provinces most affected by stunting, income and asset poverty and multi-dimensional poverty. However, UNICEF left Stung Treng in 2011. UNICEF has a very good reputation among its partners for working in poor rural areas and in remote communities. Yet, only two of the UNICEF RWS intervention provinces were among the most remote and least densely populated (Stung Treng and Oddar Meanchey in the north), and these provinces were no longer covered after 2010.[53] In 2016, UNICEF reoriented part of its investment toward indigenous populations in remote and dispersed villages located in the north-east.

[52] UNICEF situation analysis of 2013.
[53] This echoes the UNICEF Country Programme Document 2011–2015, which states: "An internal analysis found that higher levels of vulnerability were mostly found in provinces other than those selected."

Additional interviews and more detailed analysis would be needed to understand the reasons why some intervention provinces/communes/communities were selected. Reasons could include the high prevalence of well use, the occurrence of an emergency, such as flooding, direction given by government counterparts, willingness to diversify intervention areas, the presence of a good implementing partner, the presence of a licensed water operator, etc. In addition to equity principles, geographical targeting can be guided by humanitarian, political and efficiency considerations. In some situations, trade-offs between these criteria may be necessary, with the resulting targeting becoming partially strategic and partially opportunistic.

It should be noted that UNICEF recently decided to select the north-east as a geographical area of programmatic convergence for the new Country Programme Document beginning in 2016, which is a relevant decision from an equity perspective.

The above analysis highlights that there has been a gap between the geographical targeting strategy/criteria as communicated by UNICEF and the actual selection/prioritization of intervention sites in the field.

E.5.2. Equity measures in implementation

While UNICEF RWS intervention provinces and communes may not have been the most vulnerable and deprived in Cambodia, many UNICEF-supported interventions did include measures that aimed to help the most vulnerable and deprived households within intervention communities benefit from the service:

- As noted, the water provided by wells/boreholes is typically free. This not only benefits hosts and neighbouring households but also benefits those unable to afford a higher level of service.
- Since 2013, UNICEF has financed a subsidy to help 400 households classified as very poor (based on the IDPoor identification system) connect to the piped network and benefit from a higher level of service than they could have otherwise afforded.[54] This was a modest contribution to achieving a relatively high average connection rate of 52% within intervention communities (range: 30 to 72%).[55]
- As per the national RWS policy, which promotes slightly rising tariff blocks based on water consumption, households consuming less water (usually the poorest) are supposed to benefit from a discounted tariff.
- Water operators are asked to pay a fee to the commune, which is intended to help the poorest access the service.
- Some water bottling plants were initially supposed to offer a discounted tariff for IDPoor card holders: 1000R.

The actual application and results of these measures are nuanced, as described below.

E.5.3. Limitations in equity measures

Regarding boreholes/wells, maintenance and replacement are fully dependent on the landowner's capacity (and willingness) to support associated costs or raise money among users. This implies a potential risk of access limitations, particularly for the poorest, who may use this affordable water supply the most and are less able to contribute financially.

[54] Some 400 household holding an IDPoor card benefited from a 40 USD subsidy for a 70 USD household connection.
[55] Based on the study: How have privately managed water supply systems in Cambodian small towns evolved? Key trends from 15 years of experience, GRET, 2016, and based on interviews with private operators.

Regarding household connections to the piped systems, the GRET study shows that the subsidy effectively decreased the connection cost and also helped operators offer a lower water tariff for poor households. As a result, UNICEF-supported interventions were reportedly able to reach the poorest more effectively than other similar projects funded by the World Bank Water and Sanitation Programme and the Asian Development Bank. Unfortunately, this success did not continue after the UNICEF subsidy ended, and the positive effect on the water tariff did not last much longer.[56] It would be worth verifying how many of the targeted households ended up actually benefiting from the subsidy. Another equity concern with most piped network systems visited in the field is that they have implemented a flat rate tariff, with no cross-subsidy mechanism,[57] despite it being an aspiration of the Government to introduce tariff blocks. The fee was not always paid by the private water operators to the commune, and, when it was, no evidence was found that it was effectively used to support the households in need as per the public-private partnership agreement.

Regarding bottling kiosks, field interviews showed that this practice reported by the NGOs was not found to have been consistently applied in practice. As a result, the tariff remains expensive for the poorest: 1,300 Riel or 0.32 USD per 20 litres vs. a 0.2 USD per 20 litres 'affordability limit' for very poor villagers, according to Teuk Saat 1001.[58] A report published by the NGO in 2016 recognized the absence of data on the wealth profile of customers, but stated that "for a customer at the poverty line level, drinking everyday 1.5 litres of safe water represents a cost of 0.85 USD per month, i.e. no more than 3.3% of his/her monthly income. This means that for at least 75% of the villages population (those living over the poverty line), drinking this safe water every day represents a monthly cost not higher than 3% of their budget, which is to be considered as fully affordable".[59] It is to be noted that WHO recommends a consumption of 2.5 litres per person per day for drinking. In 2012, a study published by the University of Edinburgh in 2012 confirmed this with robust survey data: "Teuk Saat 1001 bottled water had not reached the poorest families in the community. Current uptake of the system shows sales trending towards the middle- and high-wealth members of the community, with a high proportion of the lower income households stating that the bottled water was 'too expensive' in comparison to their existing methods".[60] With 19% of the village population buying bottled water on average, according to Teuk Saat (field interviews suggested a lower percentage), it is clear that this water is not being purchased by the poor. From a value for money and social justice perspective, it would make little sense to use public funding to chronically subsidize a model that serves relatively wealthier households. This also contradicts UNICEF's equity mandate.

The three main RWS models supported by UNICEF did not include a platform or mechanism for the voices of the community members, particularly women and the most vulnerable, to be raised and heard.[61] This is in contrast to good practices in equity-lensed RWS programming, which

[56] How have privately managed water supply systems in Cambodian small towns evolved? Key trends from 15 years of experience, GRET, 2016

[57] Except for one operator in Kompong Kong Province, who stated that the IDPoor cardholders receive 1 m^3 of water for free every month.

[58] Teuk Saat 1001, 'Ensuring Sustainability: A social business', 2016.

[59] 1001 Fontaines, Cambodia Economic Sustainability Report 2016.

[60] Hutchens, C., D. White and B. Antizar Ladislao, 'Is Bottled Water Affordable for the Poorest in Rural Cambodia?' Changing Course: Global Engineering Education Conference Proceedings, University of Edinburg, London, 2012, available at: http://www.research.ed.ac.uk/portal/files/8750959/2012_EWB_Hutchens_White_Antizar_Ladislao_Final.pdf, accessed 28 December 2017.

[61] The UNICEF 2009 situation analysis states: "Field observations show much higher mobilization and empowerment of women in CLTS than in water supply. A focus group with Ministry of Rural Development's water supply team in the UNICEF-supported provinces revealed that there is little knowledge of either gender equality or equity issues related to water supply. Neither Ministry of Rural Development nor UNICEF have provided gender technical

apply regardless of the type or owner/operator of the service they use. For example, the participation of women in WSUGs is not tracked. Community members, including women, are also not represented as part of the contract with private operators to monitor and report on water quality testing, tariff abuses and service interruptions. Such an engagement and accountability arrangement would have been particularly relevant given the for-profit type of management of two of the three promoted models and to compensate for the weak capacity/engagement of the communes to represent the interests of service users.

No evidence was found that UNICEF and its partners generated data and knowledge on the relevance, effectiveness and sustainability of the described equity measures or advocated to make pro-poor subsidies, discounted tariffs and cross-subsidies a national policy at the central level. There could be an opportunity for a national pro-poor policy to be implemented through communes that collect fees (more consistently) from private operators.[62] The need for this kind of policy could be supported by a study to explore whether the domestic connection service is actually reaching the poor (or at least 60% of the population).

E.5.4. Conclusion on equity

Overall, UNICEF has clearly considered equity, and the pro-poor subsidy for household connections is its main achievement in this regard. Nevertheless, an overall equity strategy for each stage of the programme cycle and across all types of RWS interventions (including in monitoring and evaluation systems, knowledge management and policy advocacy) that makes the best use of the existing IDPoor system has been lacking.

E.6. Innovation

UNICEF's introduction of innovation and innovation scale up, in particular in the following areas: innovative financial mechanisms to support access to the service; private sector participation in the management of rural water supply services; real-time monitoring; sector accountability; and regulation arrangements

E.6.1. Arsenic groundwater contamination mapping

In the early 2000s, UNICEF was innovative and proactive when high arsenic concentrations in groundwater became a public health issue in Cambodia (20 years after a similar arsenic crisis disrupted the entire RWS strategy in Bangladesh). UNICEF funded and implemented arsenic mapping at the national level to identify critical areas in which specific water supply strategies should be implemented. Teams from UNICEF and PDRDs travelled across these areas to raise public awareness of the arsenic threat. Tens of thousands of public and private wells were painted in red and green, depending on water quality results, to reach both literate and non-literate populations. In order to carry out nationwide groundwater quality assessments on a tight timeline, UNICEF implemented innovative staff organization approaches in which public officers were employed through direct cash transfer mechanisms.

assistance or training to help this TOT team understand how to practically facilitate men and women participating and benefiting equally in each of the key activities in water supply. This is the specific gender training and support that is critically needed." These observations were still valid during the country case study field visit.

[62] The evaluation team did not find evidence of this type of arrangement during the field survey.

E.6.2. Private sector participation, bottled water plants in villages, regulation and accountability

Over the past 15 years, the main evolution in RWS in Cambodia has been the rapid development of privately funded and constructed surface water treatment plants and piped network systems in rural areas. UNICEF has not led this process but rather was a follower and a supporter. Before the 2014 programme cooperation agreement, its first collaboration with GRET began in 2003 when piped systems were still relatively rare in Cambodia and mostly supported by GRET. UNICEF was already willing to take on the risk of supporting GRET, but did not place this service option at the centre of their RWS agenda. Subsequently, UNICEF served as a financial partner rather than as an advocate for policy framework improvements and contributed to the scaling up of this model, which is highly relevant in the Cambodian context.

The bottled water kiosks have been an innovative approach for UNICEF Cambodia and UNICEF globally. Water has been bottled by the private sector in Cambodia for 15 years, however, and on a much larger scale than the projects UNICEF was supporting. The interesting and innovative element is the introduction of small-sized bottling plants in small towns and rural villages (i.e. promoting bottled water outside of its original market niche and at a cheaper price than in cities). UNICEF, along with other donors, also played a significant role in the expansion of this model.

A finding of this case study is that UNICEF could have been a more proactive supporter or pioneer in the promotion of PPPs in rural Cambodia earlier on. UNICEF could have also played a more important role in improving their design, with greater focus on sustainability, equity and evidence generated from monitoring data or studies and evaluations. Other players, NGOs and donors that were traditionally more involved in urban water supply have tried to strengthen the enabling environment (technical standards, monitoring, regulation, association of private operators, etc.) without UNICEF support. Two areas where UNICEF could have engaged more were monitoring and regulation at the central level and accountability mechanisms at the local level.

E.6.3. Real-time monitoring

The main innovation for piped water supply that UNICEF is currently involved in is real-time service performance monitoring by customers using a mobile phone-based information flow. The purpose is to check service quality (e.g. pressure and chlorination) in remote areas where the MIH has little capacity for monitoring. This approach is still under development, with pilot experiences being tested by GRET in water supply projects funded by different donors (including the French Development Agency and UNICEF). This technology-based monitoring tool is an exciting innovation that is to be highlighted (despite the fact that it was only introduced recently in 2016), documented in coordination with other sector partners and taken to scale if successful.

E.6.4. Financial instruments

UNICEF initiated or supported financial instruments to help poor households benefit from the RWS service, especially through the connection subsidy for household connections to the piped system applied at a moderate scale as described in the section on equity.

E.6.5. Conclusion on innovation and scaling up

UNICEF actively supported some innovative approaches to RWS in Cambodia. The organization primarily relied on NGOs to come up with innovative new implementation methods and provided financial support for scaling these up. UNICEF has not conducted formal testing, monitoring or

evaluation to determine if these methods actually work, though it was in the position to do so, and this could have provided added value in the sector.

Three different factors may have limited UNICEF's innovation and learning capacity in the area of PPPs: a) the tendency to favour partnerships with the Government and NGOs over private, profit-oriented entrepreneurs; b) limited internal experience with and competence in engaging with small-scale private operators, regulations and similar issues; c) procurement/partnership constraints (UNICEF's policies and procedures are designed to restrict lending to private companies in a way that would support the for-profit activities of a private entrepreneur or distort market competition); and d) previous partnerships (the PPP champion is the Ministry of Industry and Handicraft, but UNICEF's long-standing partnership is with the Ministry of Rural Development).

The evaluation team is encouraged by the 2016 and 2018 RWS plans and the real-time monitoring of projects and considers this a positive next step towards innovation.

F. Recommendations

Cambodia has developed rapidly over the past 10 years. With 70% of the rural population using improved water sources, the recent upgrade to middle-income status and a vibrant private sector engaging in the development and management of modern water supply services in rural areas, the country's challenges have changed. The objective of boosting the water supply coverage rate is being replaced with new objectives, including improving the quality of water supply services and reaching remaining communities and households still using improved water sources that are the poorest, most remote and most vulnerable. The technologies and skills for addressing these challenges are now largely locally available. The investment capacities of the Government, the private sector and households are becoming more significant, and, as a result, donors are reducing their financial aid to Cambodia. The role of external support agencies in Cambodia will therefore need to be adjusted accordingly to support the country's development in relevant ways with fewer resources. Now more than ever it is important for UNICEF to consider its added value going forward and its comparative advantage vis-à-vis other players, including the Government, development agencies, the numerous international and national NGOs and private entrepreneurs. In the WASH sector generally, and the RWS sector in particular, UNICEF will not be expected to implement large projects at scale. UNICEF is in the position to leverage resources and capacities, orient them where the needs are greatest and use them in the most relevant, efficient and sustainable way.

The Country Programme Action Plan 2016–2018 does not identify RWS as a priority area of WASH programming and does not propose a related indicator in the results framework. UNICEF's strategy and level of investment are therefore uncertain over the next few years. However, the Sustainable Development Goals (SDGs) impose an ambitious agenda for the sector: universal use of safely managed drinking water supply services by 2030. The Government of Cambodia has set its own target for universal access by 2025. In addition, in its new global strategy, UNICEF established a 'core accountability' for its WASH programming that "children and their families use a basic drinking water service and drink safe water at home". This accountability commits UNICEF to act where children do not even have a basic level of service.[63] According to the latest JMP report published in 2017, in Cambodia almost one third of the population still does not use the basic level of service, and 15% of the rural population rely on untreated surface water for drinking, with a much higher rate in some regions. Only 16% of the rural population drink water that is free from contamination (i.e. faecal contamination, arsenic and fluoride).

The recommendations below propose a way forward for UNICEF, assuming it will aim to contribute to the country's progress towards the water supply SDG target and its own development agenda as well as to UNICEF's commitment to children and their families. Although they are presented in a structured and logical way, they should be considered as a menu of options rather than a plan of action. The most appropriate options for UNICEF will depend on numerous factors, including the dynamic in the sector, UNICEF's strategic vision for its assistance to the country, the resources at its disposal and the positioning of other RWS donors and stakeholders.

[63] United Nations Children's Fund Programme Division, 'Strategy for Water, Sanitation and Hygiene 2016–2030', UNICEF, New York, August 2016.

F.1. A medium-term vision and a theory of change for UNICEF's RWS programming

1. **Analyse the sector context and UNICEF's comparative advantage and added value in a prospective way, looking at 5 to 10 years into the future. On this basis, develop (or revisit) UNICEF's medium-term vision and associated theory of change for its RWS programming** with the aim of making the best use of its limited resources. Three principles can guide the development of this formal, written vision and theory of change:
    - Focusing on UNICEF's niche in the sector;
    - Linking up (or strengthening the link between) the work supported by UNICEF in the field (downstream) and its agenda for strengthening the enabling environment for the sector (upstream);
    - Inducing or supporting transformational changes.

F.2. At downstream level: Refining RWS service models

2. **At the downstream level, determine which RWS service models and technologies are appropriate in which context and for which segment of the population; and strengthen/refine them with the aim of enhancing their efficiency, sustainability and equity.** This implies implementing a critical and well considered documentation, evaluation and research agenda for the sector as a whole, which will help generate evidence on the advantages/disadvantages, successes/challenges/weaknesses, and the preconditions for the success of the various RWS models. Based on the findings from this evaluative case study, some actions are already proposed below.
3. **For piped network systems**:
    A. In collaboration with the Government and other development partners involved in this model, such as the World Bank Water and Sanitation Programme, The Australian Department of Foreign Affairs and Trade, and the Asian Development Bank, conduct a study to determine whether the Government and the sector as a whole should encourage existing operators to extend their networks and invest in new licenses, or encourage new operators to enter the market. The former would help existing operators gain more experience, create economies of scale and invest in service expansion; cross-subsidize across systems; more easily monitor and regulate a reasonable number of operators; and send the message that water is a profitable business. The latter would increase the level of competition and drive for performance among service providers and reduce risks associated with oligopolies, including tariff increases, collusion with local governments, etc.
    B. Continue the real-time monitoring pilot, document and share lessons with the government and other sector players to ensure buy-in, evaluate and adjust when appropriate and take it to scale if successful.
4. **Regarding bottled water plants**:
    A. Further analyze the business model, long-term financial viability and efficiency. This would involve: an independent identification/estimation of the life cycle costs (including capital replacement costs), the potential consumer base (households' demand and

willingness to pay for the service, their seasonal variations and their possible evolution in the future), and its possible evolution. This analysis should be based on robust field survey data collected from a statistically sound sample of sites representative of the diversity of operating contexts. A comparison between the models of Teuk Saat 1001, Lien Aid, and other sponsors/operators present in rural areas and small towns, as well as with other alternative models, would help further refine the existing models and inform decision making, including on upscaling and geographical targeting.

B. Based on the study results, work with NGOs, operators, communes and the Government to further refine the business model and contractual arrangements to maximize sustainability, equity and accountability. Options could include:
    - Refocusing the geographical targeting on the areas and communities where there is a need, an informed demand and a niche for bottled water;
    - Systematically conducting a willingness to pay survey and a financial viability study before deciding to build a new bottling plant;
    - Increasing the tariff for wealthier customers;
    - Mainstreaming targeted subsidies for the IDPoor where no appropriate source of water is available at a reasonable distance; and
    - Strengthening local accountability and national level monitoring and regulation (see recommendation 8 below).

C. Concerning water safety: Request that partner NGOs test the quality of the water source and periodically test the presence of arsenic and other dangerous contaminants in bottled water (if not already done); and assess the risk in terms of water pollution in the medium term, taking into account the variability of arsenic contamination over time.

5. **Regarding boreholes/wells**:
    A. Continue to periodically monitor arsenic contamination in existing boreholes/wells in areas known to be at risk.
    B. Generate quantitative evidence on the functionality of these water points, on their appropriation by the hosting household and on the functionality, sustainability and appropriateness of WSUGs.
    C. Consider discontinuing support to boreholes/wells and the WSUG management model in areas where alternative and more appropriate options are feasible.
    D. In areas where boreholes/wells are appropriate and necessary, consider supporting the professionalization of the drilling sector and its enabling environment. UNICEF and the RWS Network have recently published a guidance note to inform such efforts at the country level.[64]
6. **Supporting private initiatives and market-based approaches**, capitalizing on UNICEF's experience. UNICEF's main programmatic objective would be to increase the quality of the water supplies/services for remote communities and vulnerable households that are not yet in the position to access or use piped or bottled water (*see also Recommendation 9 on the development of an equity strategy*). This approach may be very appropriate in the Cambodian context, where water resources are easily accessible; where a significant proportion of the population still uses surface water;[65] where communities and households are increasingly able or willing to invest their own resources to improve the 'water supply chain' from the

[64] 'Professional Water Well Drilling: A UNICEF guidance note', UNICEF, 2016, available at: www.rural-water-supply.net/en/resources/details/775
[65] 13%, based on the 2017 JMP report, and 24% according to the UNICEF Cambodia 2013 situation analysis report.

source to the point of consumption; where the poorest cannot afford a higher level of service but can act together to improve the source they already use; and where the local private sector is dynamic and ready to learn and invest wherever profitable. This approach could help UNICEF make the best use of its limited funding for RWS and maximize its contribution and added value to the sector (thus optimizing the value-for-money relationship). It would involve three concurrent actions: supporting the demand, supporting the supply side and strengthening the enabling environment.

A. Support household demand and self-investment, tapping into and further developing households' investment willingness, capacity, skills and creativity. UNICEF Cambodia already has considerable experience with this approach in rural sanitation but not in RWS. This could involve the following: communicating promotional messages to raise awareness on the risk of surface water in arsenic-free groundwater areas and inducing households to build and use an improved water source (*see also Recommendation 7*); providing technical advice for communities to protect and develop their water springs and wells; and offering light, targeted subsidies where necessary. These activities can be packaged together with CLTS as part of the water safety plans recently tested by UNICEF Cambodia.

B. Support the supply side. UNICEF Cambodia has considerable experience with this approach both in sanitation (sanitation marketing) and water (ceramic filters, etc.). It could continue in this vein and expand the market-based approach; train small-scale, local private entrepreneurs and drilling businesses on low-cost, improved drilling techniques; support other local/cheap options for hand pumps; shape the market for more household water treatment technologies; help producers promote the acceptance and use of bleach; and sponsor improved jars with a tap and cover for better household water storage and handling practices.

C. Strengthen the enabling environment. This could include, for example: conducting advocacy to better include this approach in the sector policy if needed; building the institutional capacities of ministries in charge of promoting the demand for improved RWS and supporting private entrepreneurs (i.e. the Ministry of Rural Development and the Ministry of Industry and Handicraft); advancing measures to improve the investment environment; and improving the enforcement and control of water technology guidelines and water quality standards.

F.3. At downstream level: Cross-cutting issues

7. **Revitalize the Communication for Development strategy and intensify related activities in the field**. Stakeholders interviewed consistently pointed to community mobilization and awareness raising as among UNICEF's key strengths. UNICEF could capitalize on this comparative advantage and use its strong brand and credibility to further advance this agenda, addressing some of the key issues in the sector.

    - Inappropriate water handling and storage in open jars placed in an unhygienic environment were observed in households. In addition, more than one third of households did not have a handwashing facility with water and soap.[66] This is a concern because piped networks and boreholes were installed to deliver safe water, yet recontamination occurs at the point of consumption, threatening the health of people, particularly children. Finally, many households still use surface water or other

[66] World Health Organization and United Nations Children's Fund, *Progress on Drinking Water, Sanitation and Hygiene: 2017 update and SDG baselines,* WHO and UNICEF, Geneva, 2017.

unimproved sources, especially during the rainy season. Therefore, water treatment, safe handling and storage and handwashing with soap should be more intensively promoted, together with messages on the benefits of using an improved water source, to encourage households to switch/stick to an improved source and increase their willingness to connect, use and pay for a safe source of water.

- This would have the effect of increasing the consumer base for piped water systems and strengthening the financial viability of such services, leading to more sustainable PPP arrangements.

The current community outreach model mainly relies on communes and private operators to sensitize the community about the importance of safe water and hygiene practices. However, the underlying theory of change is weak, as communes and private operators do not have the skills to fulfil this responsibility, and private operators are seen by communities as having a vested interest in increasing household connections in order to sell more water and improve their businesses. UNICEF WASH and Communication for Development programmes are better placed to work with the Government, NGOs and communication and media companies to launch a long-term, continuous behaviour change communication campaign. Such campaigns, which would target the bad practices highlighted above, should be multi-channel (television, radio, Internet, community meetings, sensitization in schools and health centres and door-to-door visits) and ideally coordinated with other Communication for Development activities in health and nutrition. The campaigns should intensify every year immediately before and during the rainy season.

8. **More strongly place quality and sustainability of the service at the core** of UNICEF's RWS programming and as an integral part of the models it promotes (particularly the PPPs). This implies the following:

   A. Gather data on functionality, water quality, management and commercial activities, revenues and costs, and financial viability from the field (through surveys), operators or partner NGOs to understand the situation and the challenges to be taken up.

   B. On this basis, develop a sustainability action plan for the sector.

   C. Continue to support the professionalization of private operators, notably through a more active, autonomous and useful association of water supply operators (CWA), as well as more demanding training, assessment and licensing processes for water operators, including periodic refresher trainings and continuous technical assistance or peer support.

   D. Centralize the existing technical and financial performance monitoring system as well as the water quality monitoring system, which are currently primarily in the hands of NGOs and communes. Efforts to establish an effective regulation mechanism/agency for RWS, especially for systems managed by private operators, should be pursued in collaboration with other relevant donors and NGOs. Effective regulation needs to be underpinned by appropriate and transparent incentive and sanction mechanisms. Experience from other UNICEF country offices such as Rwanda could be beneficial.

   E. Establish appropriate accountability arrangements at the local level. The PPP arrangements examined in the field have a very weak public component and could actually be considered a partnership between an international NGO and a local private operator, with very limited involvement and responsibility of the commune and the users. The commune should always be part of the contract and responsible for its contractual obligations, including maintaining access roads in good conditions; preventing service interruptions and tariff abuses; supporting the access of the poorest to the service;

regularly testing water quality (pH is not critical from a public health perspective[67] but arsenic is); monitoring service performance and user satisfaction; representing the interest of the users; contributing to infrastructure replacement costs, etc. Operators should more consistently report to the commune. Users should be offered mechanisms for raising their voices, filing complaints and holding operators and communes accountable. This framework of mutual accountability would strengthen the decentralization process, empower the community, incorporate human right-based principles into RWS programming and advance UNICEF's sustainability and equity agendas. The UNICEF Headquarters WASH section published the 'Reference Guide for Programming' on accountability mechanisms in WASH, which could be used as a basis for developing future plans. In addition, the experience of UNICEF Rwanda could be useful in this regard.

9. **Develop a comprehensive equity strategy for UNICEF or for the WASH/RWS sector more generally** that addresses the following issues:

   A. Geographical targeting: A clear strategy should be spelled out and implemented. This strategy should be guided by several considerations, including equity, effectiveness and efficiency, with potential trade-offs between them. The equity lens should continue to guide UNICEF towards communities where the highest number or proportion of households still use contaminated and untreated surface water, in line UNICEF's focus on the north-eastern part of the country since 2016. As one of numerous players, UNICEF's geographical targeting strategy should be defined in coordination with other sector stakeholders and under the leadership of line ministries. The WASH section should also consider the new Country Office strategy of inter-sectoral convergence. Given that poor households exist in any community, individual targeting should be considered as critical as district and community level targeting.

   B. Equity in programme design and implementation: Enforce/strengthen specific measures for poor and vulnerable households within intervention communities.

      - Encourage partners to more intensively involve beneficiaries in the choice and design of the most appropriate RWS model.
      - Make sure that the voices of women and of the poorest and most vulnerable/marginalized households are included within local accountability mechanisms.
      - Continue to subsidize the connection of IDPoor households to the piped network.
      - In coordination with other donors, study/test the use of other pro-poor financing instruments, such as revolving funds, micro-credits and financial incentives for operators through output-based aid.
      - Request that NGOs and operators more consistently apply the pro-poor tariff for both piped and bottled water.

   C. Make better use of the IDPoor system throughout the programme cycle:

      - For situation analysis: Identify correlations between poverty and poor WASH conditions, which will be collected from IDPoor households during the household survey and use this evidence to build a case for WASH interventions as pro-poor interventions.
      - For geographical targeting, as part of the equity criteria for selecting beneficiary communes within intervention provinces/districts, UNICEF could focus on those that

[67] Although it was observed in the field that pH was more often tested than arsenic, for unexplained reasons.

have the highest density of poor households (as the intra-community data from the commune database are reported to be not entirely reliable).

- Discounted water tariffs and subsidies should be more consistently advertised and applied to IDPoor households, using IDPoor processes/communication channels.
- Formulate key indicators within UNICEF and government RWS monitoring and reporting systems in a more equity-lensed manner (disaggregation). Collect gender and IDPoor data from service users and non-users in intervention areas. Analyse these data to examine the equity friendliness of the UNICEF-supported interventions and the extent to which they help reduce the inequalities between the most vulnerable communities/households and the rest of the population. Report annually to the Government and donors.

10. **Continue to advance integrated programming** between RWS and other WASH interventions (CLTS, WASH in institutions, etc.) as well as with other non-WASH UNICEF programmes (nutrition, health, education, early childhood development, etc.). Note that integrated programming goes beyond geographical convergence in the same communes. Achieving holistic results for children and their families usually implies joint donor proposals and programme planning; an integrated theory of change and results framework; not only an integrated package, but also a well-considered sequencing of activities in the field; joint implementation partnerships; common monitoring and evaluation frameworks and data collection processes; joint coordination in the field within UNICEF; harmonized reporting arrangements; and an evaluation and learning component to validate or adjust the approach.

F.4. At upstream level: A plan for evidence generation, knowledge management and policy advocacy

11. **Develop an evidence generation and knowledge management plan for RWS** in a collaborative manner. Possible areas of investigation have been mentioned earlier for sustainability, equity and efficiency. Link this with government monitoring and reporting processes and with UNICEF's WASH monitoring and evaluation system as well as with the content of UNICEF's partnership agreements with international NGOs. Use and disseminate the resulting evidence to inform sector policies and planning and improve RWS models in the field. For an organization like UNICEF, and in the Cambodian context more specifically, the downstream level agenda makes more sense when directly connected with and feeding into upstream work. Experience, successes and challenges need to be documented through robust evidence and addressed through evidence-based policy advocacy and institutional strengthening to trigger transformational changes in the sector.

F.5. At upstream level: A revitalized partnership with the Ministry of Industry and Handicraft

12. **Further strengthen the existing partnership with the Ministry of Industry and Handicraft and, if possible, advocate for a solution to the fragmentation of the sector based on an analysis of the current institutional arrangement (and associated bottlenecks) and of the various possible alternatives**. Household demand, technological options and management modalities in rural areas will progressively get closer to urban

settings. This will blur the lines of authority and responsibility for rural and urban water supply. The lack of coordination between the Ministry of Rural Development and the Ministry of Industry and Handicraft will hinder the development and implementation of the proposed plan for evidence generation, knowledge management and policy advocacy. This also threatens the overall planning and cohesion of the sector. Furthermore, UNICEF's relatively closer partnership with the MRD reduces its ability to influence the MIH and, as a result, the piped network model, including the critical aspects of quality, scale-up, monitoring, regulation and accountability mechanisms, sustainability and equity. Finally, the multiplicity of players and NGOs in the sector and the partition and sub-optimal functionality of the sector working groups weaken coordination, synergies/complementarities and cross-learning. Given its legitimacy in the sector and its coordination and convening role, UNICEF is well positioned to help the Government conduct the necessary diagnosis and undertake the institutional adjustments to bridge the divide between line ministries and address the overall fragmentation in the sector. Possible options include: implementing a medium- to long-term advocacy strategy for restructuring the institutional setting, coordinated with other large donors and NGOs; revising or revitalizing the Memorandum of Understanding with and/or between the MRD and the MIH; merging and revitalizing existing urban and rural sector working groups; and institutionalizing joint annual planning and review exercises.

G. Annexes

G.1. Timeline of the country visit

Day	Activities	Details	
		Time	Location
Wednesday 25 January	Evaluation team (Marisa Gallegos and Bernard Collignon) arrive in Phnom Penh		Street 75, 35A, Phnom Penh, 023 987 775
Thursday 26 January	Meeting with UNICEF Cambodia: • Erica Mattellone, Evaluation Specialist; Sydney Nhamo, Planning and Monitoring Specialist; Phaloeuk Kong, PME Officer • Sam Treglown, WASH Manager; Soriya Thun, WASH Specialist; Santepheap Heng, WASH Specialist; Sopharo Oum, WASH Officer; Chanthea Chaing, WASH Officer • Debora Comini, Representation • Etienne Poirot, Chief Child Survival and Development; Maki Kato, Chief SP; Sovannary Keo, CD Specialist • Natascha Paddison, Deputy Representative	08:00-08:30 08:03-11:00 11:00-12:00 15:00-16:00 16:00-17:00	Main Conference Main Conference Rep's Office CD Meeting Room Natascha's Office
	• Security briefing	13:30-14:30	UNDSS, #53, Pasteur Street, BKK1
Friday 27 January	Meeting with Ministry and NGO partners: • Meeting with H.E. Try Meng, Secretary of State of the Ministry of Rural Development • Separate meeting with Dr. Mao Saray, Director of Department of RWS	09:00-10:00 10:00-11:00	Ministry of Rural Development Meeting Room At Ministry of Rural Development office
	• Meeting with GRET and ISEA (Mr. Cheng Visal, Programme Manager; Mr. Clement Frenoux, Team Leader/WASH Specialist, and Mr. Yi Sokkol, Managing Director) • Teuk Saat 1001 (Mr. Chay Lo, Executive Director) • Lien AID (Mr. Chieng Youpheng, Programme Manager – Cambodia)	14:00-15:00 15:00-16:00 16:00-17:00	GRET Office Teuk Saat Office Lien AID Office
Saturday 28 January	Evaluation team will work on report (Skype call with Hilda)		
Sunday 29 January	Evaluation team will work on report		
Monday 30 January	Meetings in Phnom Penh		

Day	Activities	Details	
		Time	Location
Tuesday 31 January	**Travel to Svay Rieng Province** • Interview PDRD Director/Deputy Director • Interview representative of Cambodian Red Cross in Svay Rieng, particularly related to the UNICEF supported water supply systems (10 deep boreholes) • Followed by field visit to the deep boreholes and discussion with beneficiary families (Chantrea Commune and district), Samroang (along the way and faster)? • Travel to Prey Veng Province Overnight stay in Prey Veng Province	07:00-10:00 10:00-11:00 11:00-12:00 12:00-13:00 (lunch break) 13:30-15:30 15:30-17:30	PDRD Office CRC Office Communities
Wednesday 1 February	**Visit Prey Veng Province** • Interview PDRD Director/Deputy Director (in charge of UNICEF-Ministry of Rural Development Programme) – Ung Ty *(There will be a small group meeting at PDRD office maybe two to three potential NGOs only that are mainly working on rural water supplu)* • Interview with Provincial Department of Industry and Handicrafts in Prey Veng (Mr. Kosal – Director) • Followed by field visit to commune where the UNICEF programme supported on household system; rainwater harvesting and borehole. • Visit to UNICEF/Teuk Saat 1001 supported water treatment and bottling plants (water kiosks) and interview entrepreneurs of the systems (Pea Reang district) • Travel to Kampong Cham Province Overnight stay in Kampong Cham Province	08:00-09:00 09:15-10:15 10:30-12:00 13:30-15:30 15:30-17:30	PDRD Office Provincial Department of Industry and Handicraft Office Commune Teuk Saat 1001 plant in Pea Reang District
Thursday 2 February	**Visit Kampong Cham Province** • Interview Deputy Director (Ms. Phallin) • Interview with Provincial Department of Industry and Handicrafts in Kampong Cham • Followed by field visit to UNICEF/Lien Aid supported water treatment and bottling plants in Krouch Chhmar District and interview entrepreneurs of the systems • Visit to UNICEF/Teuk Saat 1001 supported water treatment and bottling plants (water kiosks) and interview entrepreneurs of the systems/beneficiary families (Tboung Khmum district).	08:00-09:00 09:15-10:15 10:30-11:30	PDRD Office Provincial Department of Industry and Handicraft Office Kampong Treas Commune (Lien Aid) Roka Pour Pram Commune
	Travel to Phnom Penh	15:30-18:00	

Day	Activities	Details	
		Time	Location
Friday 3 February	Meeting with national stakeholders in Phnom Penh • Mr. Kim Hour, former UNICEF staff (Skype) • Representative of 3I (Investment in Infrastructure) • World Bank Water and Sanitation Programme • WaterAid Cambodia (Soriya inform there will be Skype call) • Cambodian Water Supply Association		
Saturday 4 February	Evaluation team will work on report		
Sunday 5 February	Evaluation team will work on report		
Monday 6 February	Team brainstorming • The French Development Agency • NGO CARD – Dr. Chea Samnang • WHO – Ms. Sophary • UNICEF – Chief Social Policy Meeting with national stakeholders • Belinda Abrahams (Skype Call)	08:00-12:00 11:00-12:00 14:30-15:30 15:00-16:00 16:00-17:00 9:00am	UNICEF Office French Development Agency Office CARD Office WHO Office UNICEF Office
Tuesday 7 February	Evaluation team workshop preparation National workshops in Phnom Penh – **half day** Evaluation team debriefing (in the evening)	08:00-12:00 13:30 – 17:30	UNICEF Office Phnom Pen Hotel
Wednesday 8 February	Wrap-up meeting, presentation and discussion of initial findings: single meeting with RGC and UNICEF country team at the Ministry of Rural Development: • H.E. Try Meng, Secretary of State, Ministry of Rural Development • Debora Comini, Representation; Natascha Paddison, Deputy Representative; Etienne Poirot, Chief Child Survival and Development; Sam Treglown, WASH Manager; Erica Mattellone, Evaluation Specialist; Soriya Thun, WASH Specialist, Phaloeuk Kong, PME Officer Meeting with EMG on next step • Sam Treglown; Erica Mattellone; Soriya Thun; Phaloeuk Kong	09:00-11:00	Ministry of Rural Development Meeting Room UNICEF Office
Thursday 9 February	Evaluation team departs Phnom Penh		

G.2. List of persons met during the visit

No	Full Name	Sex	Position	Institution	Location
1	Debora Comini	F	Representative	UNICEF	Phnom Penh
2	Natascha Paddison	F	Deputy Representative	UNICEF	Phnom Penh
3	Sam Treglown	M	WASH Manager	UNICEF	Phnom Penh
4	Erica Mattellone	F	Evaluation Specialist	UNICEF	Phnom Penh
5	Kong Phaloeuk	M	Planning, Monitoring &Evaluatio	UNICEF	Phnom Penh
6	Heng Santepheap	M	WASH Specialist	UNICEF	Phnom Penh
7	Chaing Chanthea	F	WASH Officer	UNICEF	Phnom Penh
8	Thun Soriya	M	WASH Specialist	UNICEF	Phnom Penh
9	Seng Kuysrorn	M	Freelance Consultant	Self-employment	Phnom Penh
10	Etienne Poirot	M	Chief of CSD	UNICEF	Phnom Penh
11	H.E. Try Meng	M	Secretary of State	MRD	Phnom Penh
12	Dr. Mao Saray	M	Director of RWS Department	MRD	Phnom Penh
13	Cheng Visal	M	Program Manager	GRET	Phnom Penh
14	Clement Frenoux	M	Team Lead/WASH Specialist	GRET	Phnom Penh
15	Armel Golomer	M	Technical Assistant	GRET	Phnom Penh
16	Chay Lo	M	Executive Director	Teuk Saat 1001	Phnom Penh
17	Kruy Chanrith	M	Communication M&E Manager	Teuk Saat 1001	Phnom Penh
18	Pen Samnang	M	Project Manager	Teuk Saat 1001	Phnom Penh
19	Chieng Youpheng	M	Program Manager	Lien AID	Phnom Penh
20	Hoeurn Try	M	Deputy Director	PDRD Kandal	Kandal
21	Chum Sophearith	M	Chief of RWS Office	MRD	Phnom Penh
22	Sok Samoeurn	M	Chief of Koh Thom rural dev.	Koh Thom District	Kandal
23	Khenh Taiyveng	M	Piped Water Suppy Owner	Porthiban Piped WS	Thmey Village
24	Sim Kimhour	M	Son of Mr. Taiyveng	Porthiban Piped WS	Thmey Village
25	Ming Yun	F	Villager	N/A	Thmey Village
26	Chea Kheng	M	Co-Piped Water Supply Owner	Kampong Kong W.System	Chrung Romeas
27	Chhoeurk Menglean	F	Co-Piped Water Supply Owner	Kampong Kong W.System	Chrung Romeas
28	Hak Sengtha	F	Daughter of Mengleang	Kampong Kong W.System	Chrung Romeas
29	Tep Samy	F	Accountant	Kampong Kong W.System	Chrung Romeas
30	Tok Sokha	M	Maintenance Staff	Kampong Kong W.System	Kandal
31	Tith Chamroeurn	M	Member of Commune Council	Kampong Kong Commune	Kandal
32	Nep Chem	M	Deputy Director	PDRD Svay Rieng	Svay Rieng
33	Chhim Borash	M	Office Chief of Rural Health Car	PDRD Svay Rieng	Svay Rieng
34	Mey Sambath	M	Office Chief of RWS	PDRD Svay Rieng	Svay Rieng
35	Kong Sophon	M	Deputy Chief of RWSO	PDRD Svay Rieng	Svay Rieng
36	Chav Sok	M	Chief of Training and Research	PDRD Svay Rieng	Svay Rieng
37	Tum Pheakdey	M	Chief of Chantrea Rural Dev.	PDRD Svay Rieng	Svay Rieng
38	Sor Vanna	M	Director	Cambodian Red Cross	Svay Rieng
39	Pov Saren	M	Deputy Director	Cambodian Red Cross	Svay Rieng
40	Mom Ket	M	Volunteer	Cambodian Red Cross	Svay Rieng
41	Ork Am	M	Group Leader (husband)	WSUG	Chantrea Village

No	Full Name	Sex	Position	Institution	Location
42	Chin Sokha	F	Group Leader (wife)	WSUG	Chantrea Village
43	Nou Vannak	M	Volunteer in Commune	Cambodian Red Cross	Koktek Village
44	Khiev Win	M	Volunteer Team Leader	Cambodian Red Cross	Svay Rieng
45	Sok Kady	M	Group Leader (husband)	WSUG	Chantrea Village
46	Lek Khen	F	Group Leader (wife)	WSUG	Chantrea Village
47	Kong Sakoeurn	M	Villager	WSUG	Chantrea Village
48	Sin Sim	M	Deputy Chief of RWSO	PDRD Prey Veng	Prey Veng
49	Ung Ty	M	Deputy Director	PDRD Prey Veng	Prey Veng
50	Kuy Kosal	M	Director	PDRD Prey Veng	Prey Veng
51	Khan Kaklina	F	Deputy Director	PDRD Prey Veng	Prey Veng
52	Ben Ly	M	Chief of Water Supply Office	PDRD Prey Veng	Prey Veng
53	Sen Sophen	M	Manager	Private Water Supply	Prey Veng
54	Chea Sarith	M	Preah Sdach Water Supply Ow	Private Water Supply	Prey Veng
55	Long Phearum	M	Representative	Private Water Supply	Prey Veng
56	Mich Kak	M	Representative	Private Water Supply	Prey Veng
57	Lim Sea	M	Representative	Private Water Supply	Prey Veng
58	Heak Englay	M	Owner	Private Water Supply	Prey Veng
59	Kong Chanrithy	M	Representative	Private Water Supply	Prey Veng
60	Uy Kim	M	School Director	Babong Primary School	Babong
61	Ok Socheat	F	Enterpreneur	Teuk Saat 1001 Water Kios	Chokchey Village
62	Sou Sopheap	M	Head of Community	Babong Commune	Prey Veng
63	Phal Sophat	M	Commune Clerk	Babong Commune	Prey Veng
64	Pan Phallin	F	Deputy Director	PDRD Kampong Cham	Kampong Cham
65	Mak Neang	M	Chief of Rural Water Supply Off	PDRD Kampong Cham	Kampong Cham
66	Chhem Lang	M	Officer	PDRD Kampong Cham	Kampong Cham
67	Poun Run	M	Deputy Director	PDRD Kampong Cham	Kampong Cham
68	Huot Oun	M	Chief of Water Supply Office	PDRD Kampong Cham	Kampong Cham
69	El Slaiyman	M	Enterpreneur	Lien Aid	Kampong Trea
70	Matt El	M	Enterpreneur (father)	Lien Aid	Kampong Trea
71	Man Sos	M	Chief of Commune	Kampong Treas Commune	Kampong Trea
72	Hong Chamres	F	Enterpreneur	Teuk Saat 1001	Trakoun Village
73	Phally Yea	M	Advisor of Social Enterpreneur	Teuk Saat 1001	Kampong Cham
74	Tin Mola	F	Assitant Managing Director	Investment in Infrastructure	Phnom Penh
75	Phyrum Kov	M	Cambodia Country Coordinator	Water and Sanitation Progr	Phnom Penh
76	Chan Virak	M	Water and Sanitation Specialist	Water and Sanitation Progr	Phnom Penh
77	Hor Khykeng	M	Executive Director	CWA	Phnom Penh
78	Dek Vimean Pheako	M	Project Coordinator	CWA	Phnom Penh
79	Glenn Andre	M	Project Officer	AFD	Phnom Penh
80	Keo Sovannary	F	Community Development Spec	UNICEF	Phnom Penh
81	Dr. Chea Samnang	M	Director of Cabinet	Office of the Council of Mir	Phnom Penh
82	Maki Kato	F	Chief of Social Policy	UNICEF	Phnom Penh

G.3. List of sites visited

Site Name	Owner Name	Sex	Model	Technology	Ownership	Location
Kampong Kong Piped Water Supply	Chea Kheng	M	Private Operator	Piped System	Private	Chrung Romeas Village, Kampong Kong Commune, Koh Thom Dist., Kandal
	Chhoeurk Mengleang	F				
Portthiban Piped Water Supply	Khenh Taiyveng	M	Private Operator	Piped System	Private	Thmey Village, Porthiban Commune, Koh Thom Dist., Kandal
Water & Sanitation User's Group	Ork Am	M	Group Leader (husband)	Hand Pump	Villagers	Chantrea Village, Chantrea Commune, Chantrea Dist., Svay Rieng. 15 families.
Water & Sanitation User's Group	Chin Sokha	F	Group Leader (wife)	Hand Pump	Villagers	Chantrea Village, Chantrea Commune, Chantrea Dist., Svay Rieng. 15 families.
Water & Sanitation User's Group	Sok Kady	M	Group Leader (husband)	Hand Pump	Villagers	Chantrea Village, Chantrea Commune, Chantrea Dist., Svay Rieng. 17 families.
Water & Sanitation User's Group	Lek Khen	F	Group Leader (wife)	Hand Pump	Villagers	Chantrea Village, Chantrea Commune, Chantrea Dist., Svay Rieng. 17 families.
Teuk Saat 1001 Water Kiosks	Ok Socheat	F	Enterpreneur	Bottling Kiosks	Commune	Chokchey Village, Babong Commune, Pemror Dist., Prey Veng
Lien Aid Water Bottling Station	El Slaiyman	M	Enterpreneur	Bottling Plant	Commune	Kampong Trea Village, Kampong Trea Commune, Krochma Dist., Thbong Khmum
Lien Aid Water Bottling Station	Matt El	M	Enterpreneur (father)	Bottling Plant	Commune	Kampong Trea Village, Kampong Trea Commune, Krochma Dist., Thbong Khmum
Teuk Saat 1001 Water Kiosks	Hong Chamres	M	Enterpreneur	Bottling Kiosks	Commune	Trakoun Village, Kralar Commune, Kampong Siem Dist., Kampong Cham

G.4. List of national workshop participants

NATIONAL WORKSHOP
Global Evaluation of UNICEF's Rural Water Supply Programming - Cambo
07 February 2017 at 1:30pm, Phnom Penh Hotel
Attendance List

No	Full Name	Sex	Position	Institution
1	Saing Rheny	M	Staff	MRD/
2	[illegible]	M	[illegible]	MRD/DAWS
3	[illegible]	M	[illegible]	—
4	[illegible]	M	[illegible]	PDRD/KSP
5	[illegible]	M	[illegible]	— Stung Rka
6	[illegible]	M	[illegible]	PDRD+KSP
7	[illegible]	M	WASH Program	World Vis
8	[illegible]	M	[illegible]	Gret
9	KIM HOR	M	CD	EMW
10	Chuon Sophearith	M	MRD/DRWS	DRWS
11	Pa Paing Pagna	M	MRD/DRWS	DRWS
12	[illegible]	M	[illegible]	MRD/DRW
13	[illegible]	M	[illegible]	[illegible]
14	[illegible]	M	[illegible]	—
15	Prum Siyon	M	Social emfr. Admin	TS.100/
16	TOUBKISS Jérémie	M	Evaluation	UNICEF

No	Full Name	Sex	Position	Institution
17	ERICA MATTHEWS	NE	EVAL. SP.	UNICEF
18	Lachlan Guthrie	M	Water Worker	EWB
19	Pan Phallin	F	Deputy Director	PDRD.KCM
20	Kong Phabeuk	M	PME officer	UNICEF
21	HONG HYBUNNA	M	WASH Specialist	Plan Int
22	Tin Mola	F	Assistant	3i
23	DUFIEUX Dominique	F	Deputy Executive Director	S 100/
24	THUN SORIYA	M	WASH Specialist	UNICEF
25	Tep Samy	F	Accountanting	
26	Yi Sokkol	M	MD	iSEA
27	Clément FREROUX	M	Program. Manager	GRET
28	Glen ANDRE	M	Project officer	AFD
29	Chieng Youpheng	M	Program Manager	Lien AID
30	[illegible]	M	[illegible]	PDRD-CMC
31	HOR Khykong	M	Executive Director	CWA
32	[illegible]	M	[illegible]	[illegible]
33	Keo Vicheka	F	Program Coor.	RWC
34	Khenh Muyhor	F	Staff	[illegible]

G.5. National workshop survey results

(Quotes from workshop participants)

Country-specific question	Advantages	Constraints
Do you think that UNICEF should participate actively in the urban water supply platform/working group under the leadership of the Ministry of Industry and Handcraft?	• UNICEF shouldn't participate actively. • UNICEF should participate in order to understand the difficulties of the people who have water shortage issues, and some problems encountered by the pipe water supplier. • UNICEF should participate more actively. • Active participation would lead to 100% coverage of water supply in 2025. • Piped water is the future of water supply in Cambodia, just like in other countries. • Yes, water supply plays an important role in improving access to populations. • More people can access water. Small town: between urban and rural. • Yes, access to water supply relies highly on private water operators. • Link the two sectors.	• Because it's under the management of the Ministry of Industry and Handicraft. • Has no regulation to completely separate the role of the Ministry of Rural Development and the Ministry of Industry and Handicraft. • The Ministry of Industry and Handicraft should collaborate with the Ministry of Rural Development because the Ministry of Rural Development has a mission to develop water supply in rural areas. • No official guideline document for the community to participate. • No, because they take care of the vulnerable people. • New partners may require some effort in developing good relations, but it should be fine. • Meet not really poor people. Design structure importation. • Small operators find themselves hard to comply with urban water supply regulation. • Institutional problem.
Could UNICEF play an effective role in brokering or facilitating at the communal, district and provincial level between the Ministry of Rural Development's and the Ministry of Industry and Handicraft's representatives?	• UNICEF has to continue playing a facilitating role at the commune level. • UNICEF better to play a role as facilitator. • UNICEF should pay a role as broker or facilitator. • UNICEF can play a role as a broker. • Broker or facilitator is an important UNICEF role. • Good point if UNICEF pays a facilitating role. • UNICEF can play both roles. • Yes, to align guideline and policies. • The two Ministries work are different in water supply, so working separately should be fine. • Yes. • Yes, very good with the Ministry of Rural Development. The Ministry of Industry and Handicraft just start. • Yes, coordinate in policy change on the requirement for small operator.	• Has no law to prohibit the humanitarian activity. • Difficult to differentiate between the sector and competencies of both ministries. • Principle and guideline of the Government. • Donor should not play this role. It is a government role. • New regulation with the Ministry of Industry and Handicraft. • The 2005 Memorandum of Understanding sharing the role between the Ministry of Rural Development and the Ministry of Industry and Handicraft is a bottleneck.

Country-specific question	Advantages	Constraints
	• I think so: on water quality monitoring.	
Do you consider that the sustainability of RWS can be achieved through PPPs (for pipe water systems)?	• Sustainability is unavoidably important through the PPP for piped water system. • Piped water system is sustainable. • It can be achieved by PPP. • PPP would lead to 100% water supply coverage in 2025. • Can be sustainable with the collaboration between private and development partners under the facilitation of local authority its participation. • It can be done with private sector but need some method quality. • Private sector has a very strong incentive to continue supplying in long run if it is profitable. • Yes. • Yes, more incentive for improving the effectiveness and efficiency. • Yes, but also will this hybrid model.	• Surface water supply isn't enough all year round. • Afraid of not having enough surface water. • Help facilitate the tariff and service of private. • Rural community awaits outsider support. • It can be hard working with private sector because of UNICEF or donor's rules/requirement, bureaucracy and lack of flexibility, and not every location is business viable for the private sector. • Service, quality and control. • Technical support and financial investment upfront. • Regulation and the costs of regulation.
How could UNICEF contribute to the design of PPP arrangements (licenses issued by the Ministry of Industry and Handicraft), so that they are more pro-poor?	• UNICEF has to keep supporting the PPP arrangements with the contribution at least 60%. • UNICEF increases the support to help the poor at least 70%. • UNICEF supports the technical and financial contribution to the poor households. • UNICEF should support the design of the PPP arrangement mechanism. • UNICEF should collaborate with the Ministry of Rural Development to work with local authorities. • Can help to develop regulations in relation to guidelines etc. in order to help the poor access clean water (there is a technical group that can organize this). • They can be facilitator to fix some agreed prices, for example. • Many people think lowering tariffs is pro-poor, but in reality, is not. It is the poor who are not reached by the piped network because they live far away and they have high costs of water expenses on alternative sources of water. Maybe they can help by developing feasibility for operator to apply for license. • Yes. • Small subsidy to private with output-based aid.	• Most poor households in the village live far away from the piped system. • Difficult to manage the poor rural area. • No facilitation to gather together and agree on any regulation or guideline. • Piped water cannot reach every household, so the remote and high land area may still need it. • How to select private operator management.

Country-specific question	Advantages	Constraints
	• Subsidy for infrastructure and management support for capacity building. • I think pro-poor should not be linked with contract arrangement.	
Should self-provision (homemade well, hand pump etc.) still be a significant contribution to RWS coverage in 2025?	• The idea of self-provision remains significant in 2025, but should not drill wells in arsenic-affected areas. • For the areas where the surface water is not available, the hand pump well remains significant in RWS in 2025. • Possible with the area without piped water system, but should avoid the areas covered by piped systems. • Self-provision is a significant contribution. • Self-provision is not important, but should pay more attention to piped water systems. • Self-provision is important, because the well provides daily water supply. • It can be an integral part of contribution unless the self-provision is made under a proper technical skill and analyse the water quality including chemical parameters. • Yes of course. • Piped water is more convenient, cheaper in the long run, less risk of contamination. The water delivered by truck can reach for area where pipes cannot reach. • Yes. • Yes, but need more education and monitoring on operation and monitoring.	• Lack of water source. • Should not drill a well in the arsenic-affected area without testing the sample. • Lack of management of user and insufficient spare parts for homemade well. • Lack of water quality control test and the knowledge of the well driller remains limited. • Quality control and certified equipment.
Do you think that an approach similar to CLTS could be used for water self-provision improvement? Should UNICEF be more proactive on this issue?	• UNICEF has to continue and increase more activities. • Yes, similar approach should be used and UNICEF should be more proactive. • It's possible to use this similar approach. • When water supply is implemented, UNICEF should focus more than CLTS (sanitation cannot work without having water). • Should support CLTS activities through current updates and continue supporting the implementation. • UNICEF can provide experiences and share. • Providing clean piped water does not necessary mean to make clean water to get into their body. • Yes. • Yes, community owns.	• If it's implemented by community is slow in order to respond to the coming 2025. • Lack of support would lead to failure. • Need budget to implement. • The support is not widely and remain limited. • This programme should be strengthened in pipe area to increase effectiveness. • Sustainability and management issue.

Country-specific question	Advantages	Constraints
Bottling water kiosks: present water tariff (1,200 Riel per 20 litres) seem to be unaffordable for the poor. Moreover, this tariff may not be sufficient to safeguard financial sustainability. Should UNICEF contribute to a permanent subsidy mechanism to facilitate the poor to access this service?	• UNICEF has to continue supporting the subsidy mechanism. • UNICEF should support with the subsidy. • UNICEF should have budget available to support the bottle water kiosks. • Water bottling is the work of the private sector. For the private sector to be able to increase the piped water coverage, household water treatment should be well-disseminated and the functionality of WSUGs improved in the community. • I believe they should provide the bottle for free, not the water. • Yes.	• Less sale, and the buyers think it's expensive. • Subsidy is effective only short-term. • It's not sustainable for the poor households in the future. • No, in the rural area, the poor cannot afford it. • Difficult to look for implementing partners due to the lack of knowledge and technical skill. • Private focuses on profit. • The idea of donor playing role of the system or stay permanently is a bad development principle. • Bottled water is a bit of a luxury good here. Permanent subsidy of bottled water for the poor is not value for money. People can boil water or filter to get drinking water is the source of raw water is good. Awareness raising on the benefit of clean water is necessary too.
What are the advantages and constraints of programmatic integration?	• UNICEF has supported more programmes in different ministries. • Improve the water supply sector and lead to the 100% coverage in 2025. • Step by step, the community people have access to water for consumption and with their participation would lead to access to water 100%. • Different level of risk acceptability and bureaucracy. Synergy of impact, one may need the other to ultimately achieve good of people using clean water. • Leverage the synergy.	• It's difficult to facilitate the programmes as it involves more ministries and cannot actually find a person in charge. • Lack of clear management mechanism. • There are not certain people in charge of integrated programming so far. • One development affects another development. More integration would affect the development plan because it has to modify according to the new programme. • Different developing principle.

G.6. List of documents used for this country case study

1. Situation analysis
    a. UNICEF Gender and Equity SitAn for Rural WASH in Cambodia 2009
    b. UNICEF SitAn 2013
    c. Asian Development Bank country poverty analysis 2014
    d. Multidimensional poverty index Cambodia - Oxford 2010
    e. Multidimensional poverty index Cambodia - Oxford 2011
2. UNICEF Country programme documents
    a. 2006–2010
    b. 2011–2015
    c. 2016–2018
3. UNICEF Country programme action plans
    a. 2006–2010
    b. 2011–2015
    c. 2016–2018
4. UNICEF Country programme management plans and organograms
    a. 2006–2010
    b. 2011–2015 plus organogram
    c. 2016–2018 plus organogram
    d. UNICEF Annual country programme reports between 2006 and 2015
5. UNICEF Mid-term review (2013)
6. UNICEF-led evaluation
    a. 2006-2010 Country Programme Evaluation
    b. CLTS Evaluation Cambodia 2009
    c. Child friendly schools Evaluation Cambodia 2016
    d. Evaluation of Community preschool modality Cambodia 2015
    e. Evaluation of Seth Koma WASH programme Cambodia 2006
7. Other evaluation, studies and surveys
    a. How have privately managed water supply systems in Cambodian small towns evolved? Key trends from 15 years of experience, GRET 2016
    b. Cambodia Sustainability Report 2016, Teuk Saat / 1001 Fontaines, 2016 (and associated primary data in Excel format)
    c. Access to drinking water in rural Cambodia, Sevea (unpublished draft dated May 2017)
    d. Is bottled water affordable for the poorest in rural Cambodia? University of Edinburg, 2012
    e. Ensuring sustainability: A social business, Teuk Saat 1001, 2016
    f. Cambodia Socio-Economic Survey, National Institute of Statistics, 2015

8. Ministry of Rural Development/ Department of RWS 2006–2015
    a. Results/key achievements
    b. Summary of facilities 2006–2010
    c. WASH-Seth Koma (key achievements) 2006–2010
9. UNICEF Programme cooperation agreements (with implementing partners)
    a. Cambodian Water Supply Association
    b. Cambodian Red Cross
    c. GRET
    d. Lien Aid
    e. Teuk Saat 1001
10. UNICEF donor proposals for Seth Koma Programme (2006–2010, various donors))
11. UNICEF WASH proposal to donors (2011–2015)
    a. Japan Committee for UNICEF
    b. Korean Committee for UNICEF
    c. United Kingdom Committee for UNICEF
    d. German Committee for UNICEF
    e. Government of Luxemburg
    f. Government of Canada
    g. Thematic funds
    h. Australian Department of Foreign Affairs and Trade
    i. United Kingdom Department for International Development
12. Donor reports
    a. Seth Koma (2006–2010)
    b. WASH (2011–2015) to the above listed donors (Australia, Canada, Germany, Japan, Luxemburg
13. Theory of change for integrated WASH + Nutrition programming Cambodia 2016
14. Clément Frenoux. 2016. Déterminants et performances des services non conventionnels d'approvisionnement en eau dans les villes en développement. Le cas des entrepreneurs privés locaux dans les petits centres urbains du Cambodge. Thèse soutenue à l'Université de Toulouse.

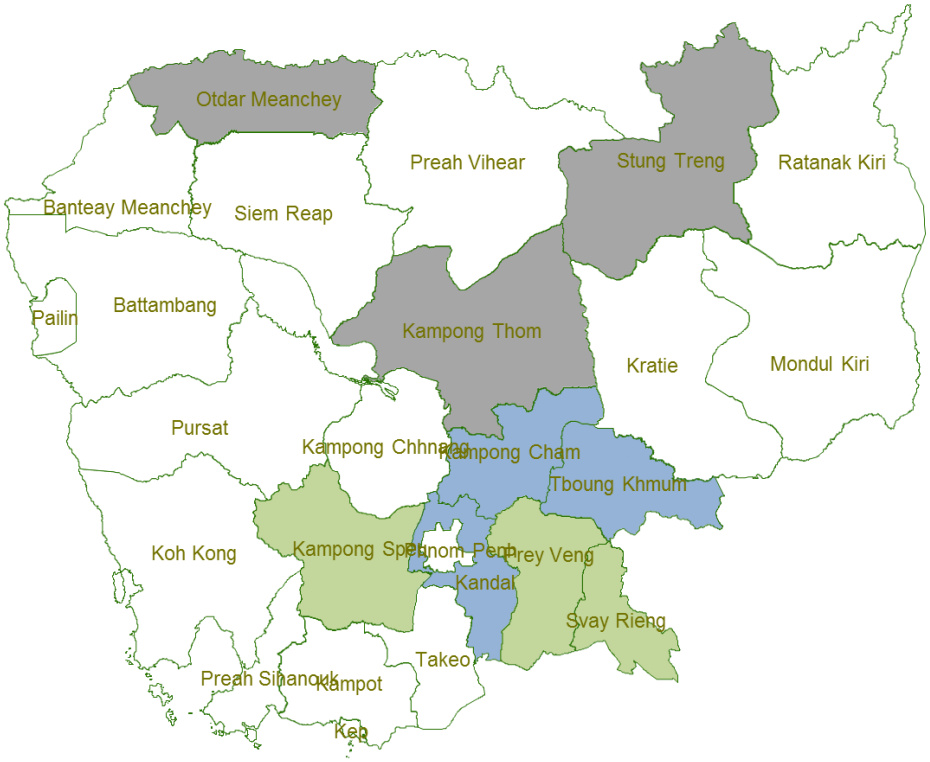
G.7. Analysis of the reconstructed business model for two water bottling plants

		Operator D	Operator E
NGO		Teuk Sat 1001	Lien AID
Rainy season sales	bottle /day	55	55
Dry season sales	bottle /day	95	85
Yearly turnover	**Riel / year**	**37 800 000**	**32 760 000**
Salaries + bonus	Riel / year	23 040 000	18 960 000
Gasoline, electricity	Riel / year	2 784 000	2 400 000
Small spare parts	Riel / year	1 440 000	3 264 000
Commune fee	Riel / year	unaccounted for	4 800 000
Water quality test	Riel / year	unaccounted for	unaccounted for
NGO support	Riel / year	unaccounted for	unaccounted for
Depreciation	Riel / year	8 000 000	10 000 000
Expenditures	**Riel / year**	**35 264 000**	**39 424 000**
Customers (with 2 liter per day per capita)		**750**	**700**
Village population		**8 140**	**11 000**
Coverage	%	**9,2%**	**6,4%**

G.8. Analysis of the geographical targeting

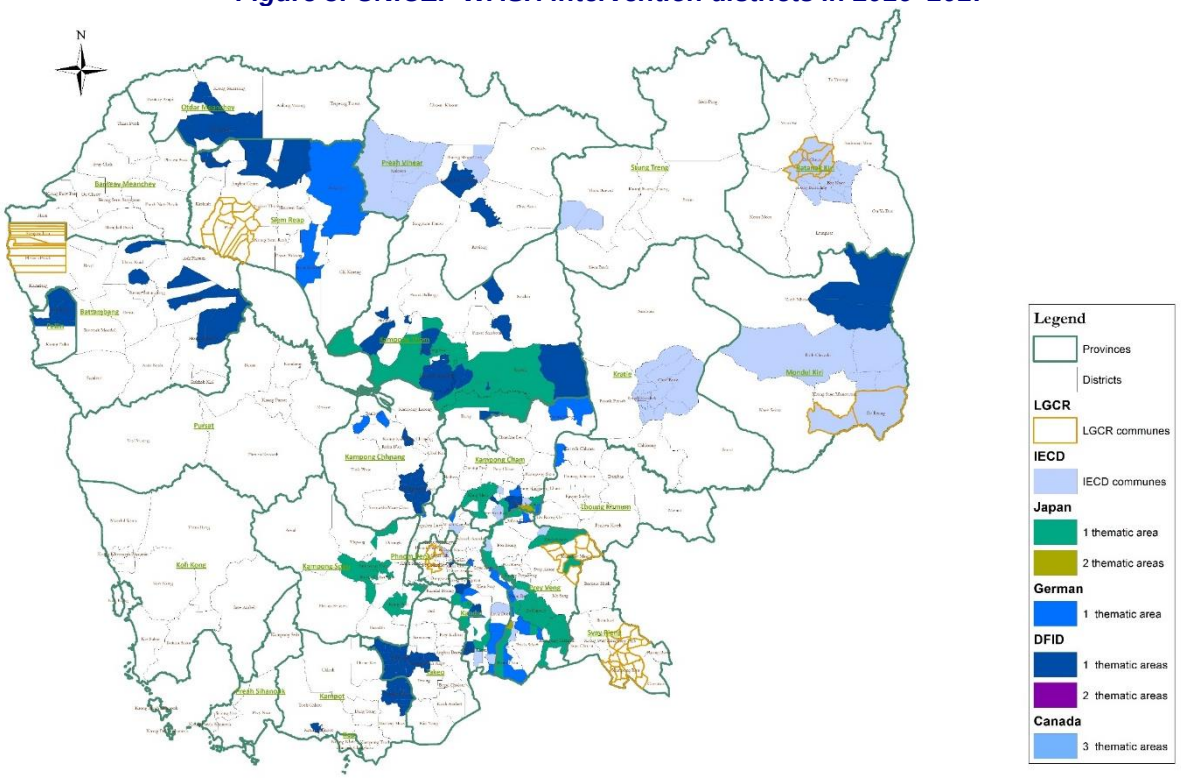
G.8.1. UNICEF WASH intervention areas, 2006–2016

Figure 2: UNICEF's RWS focus provinces 2006–2015



Source: UNICEF Cambodia.

Figure 3: UNICEF WASH intervention districts in 2016–2017



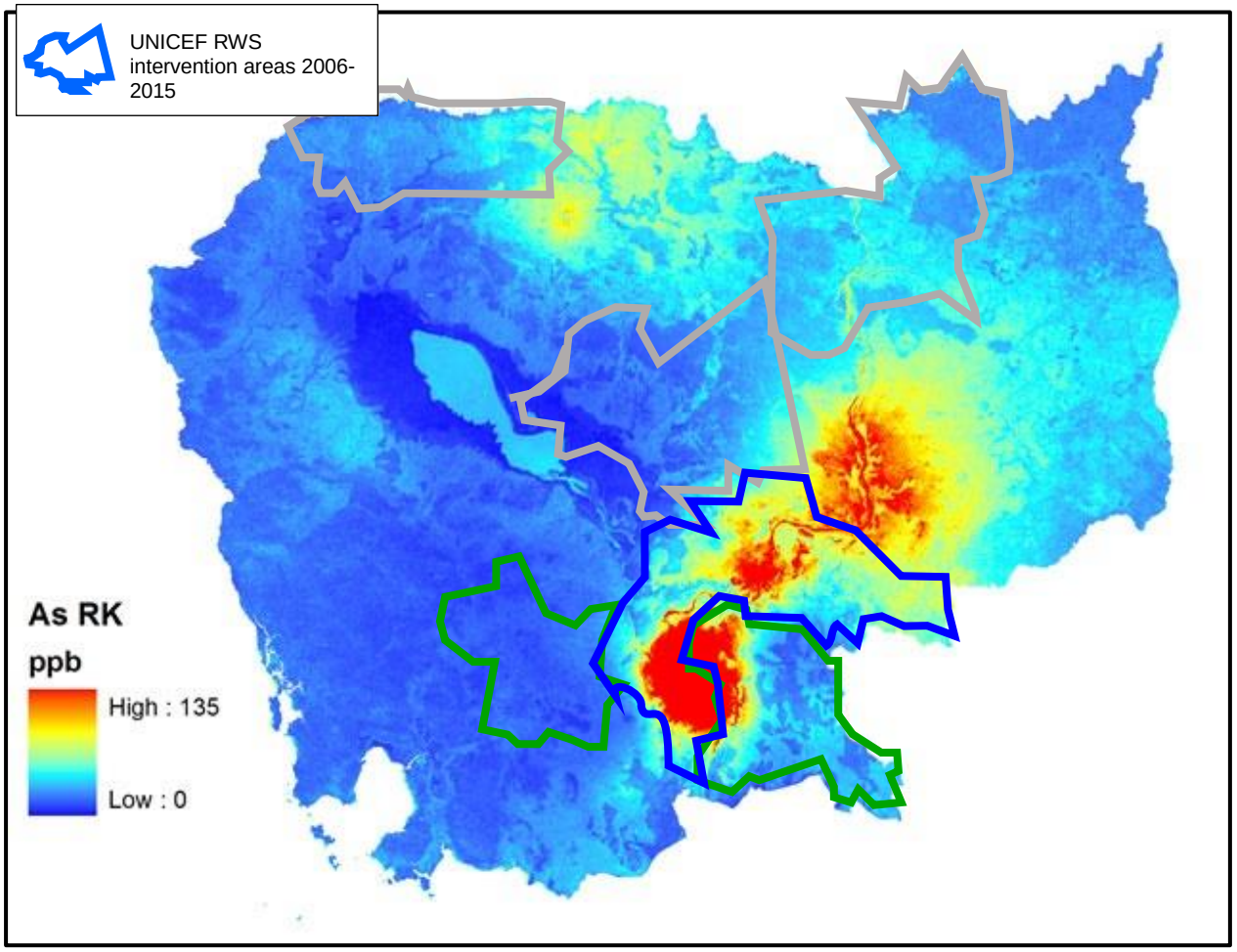
Source: UNICEF Cambodia, 2017.

G.8.2. Arsenic-contaminated areas

During the evaluation period, UNICEF reported having targeted arsenic-contaminated areas. Figure 4 visualizes arsenic-contaminated areas in the main provinces where UNICEF has intervened in RWS since 2006. The UNICEF RWS programme stopped intervening in the three provinces outlined in grey after 2011: Oddar Meanchey, Stung Treng and Kampong Thom. The three provinces outlined in dark blue are the ones that UNICEF has included in its RWS intervention area since 2011: Kampong Cham, Tboung Khmum and Kandal.

The map shows that UNICEF did not target the most affected areas before 2011. It subsequently moved to three of the most-affected provinces around Phnom Penh in the south-eastern part of the country, improving its focus on the most vulnerable populations, but continued to intervene in other provinces not affected by the arsenic issue.

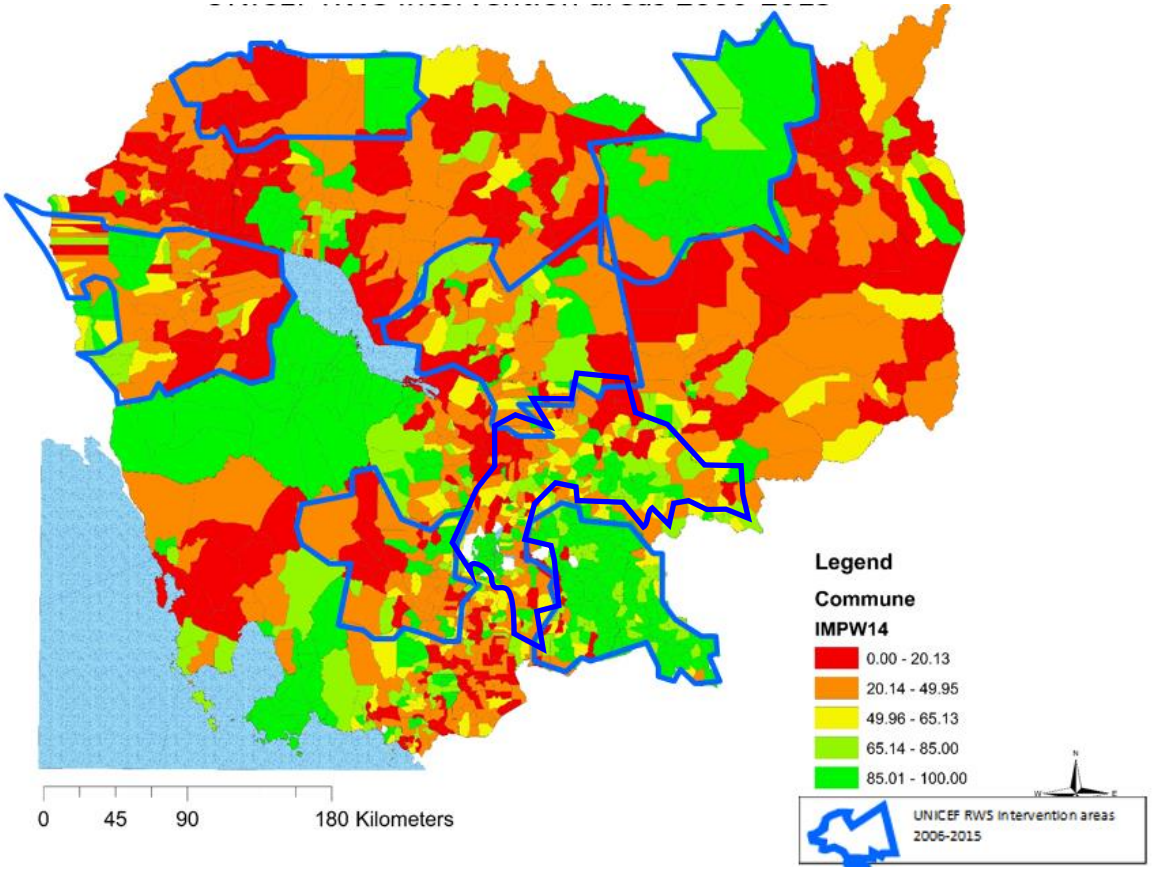
Figure 4: Concentration of arsenic in groundwater and UNICEF RWS intervention areas 2006–2015.



Sources: Joint Research Center Institute for Environment and Sustainability, 2007; and UNICEF, 2017.

G.8.3. Provinces and districts with lowest water coverage

Figure 5: Percentage of households using an improved water source, by commune, and UNICEF RWS intervention areas 2006–2015

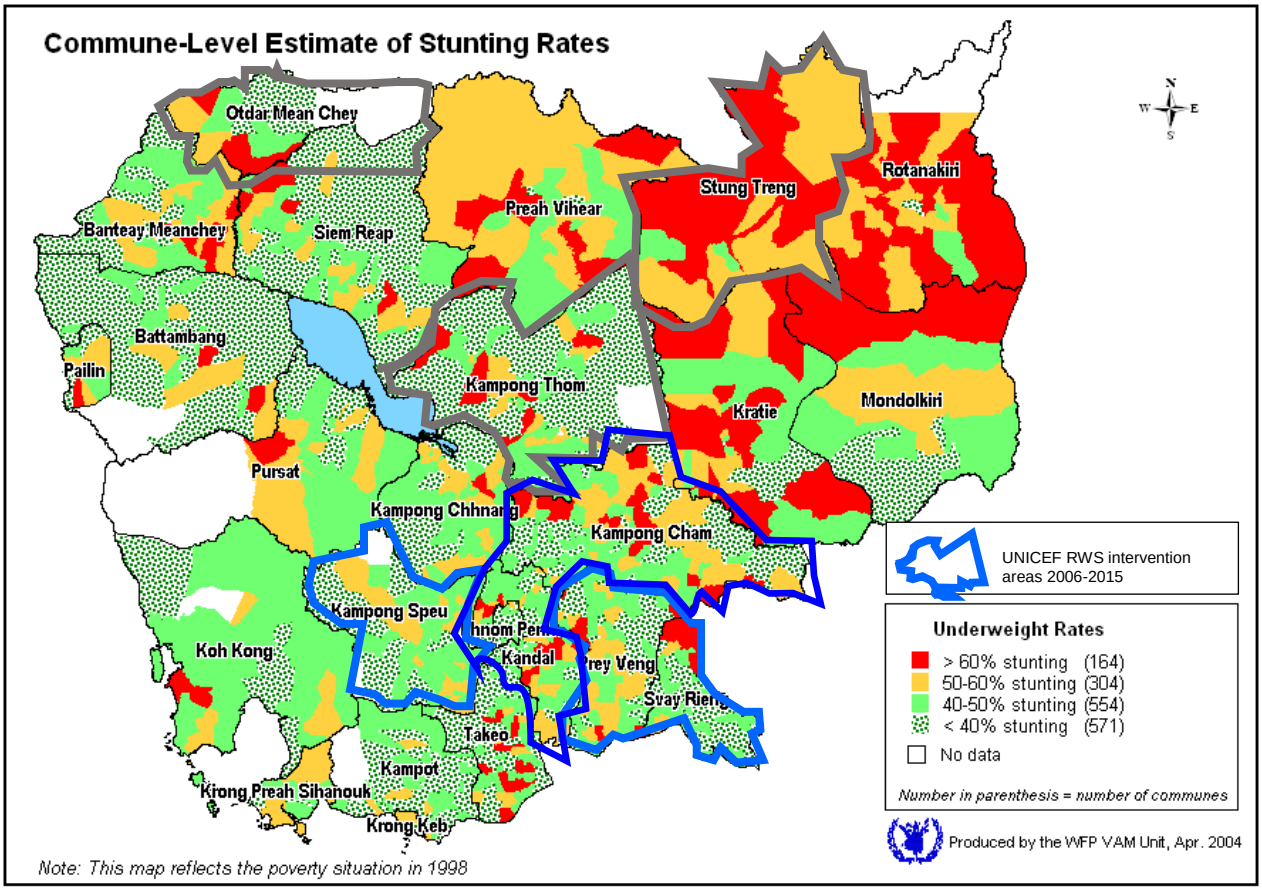


Sources: Government of Cambodia Ministry of Planning, Cambodia Commune Database, 2014; and UNICEF, 2017.

This maps shows that three of the main intervention provinces of UNICEF's RWS programme – Stung Treng, Svay Rieng and Prey Veng – had higher water coverage than the rest of the country based on 2014 data from the Commune Database. UNICEF left one of the provinces (Stung Treng) in 2011. The picture is mixed in the other five intervention provinces, with moderate coverage province-wide and, at a more granular level, with very low to very high coverage depending on the district considered.

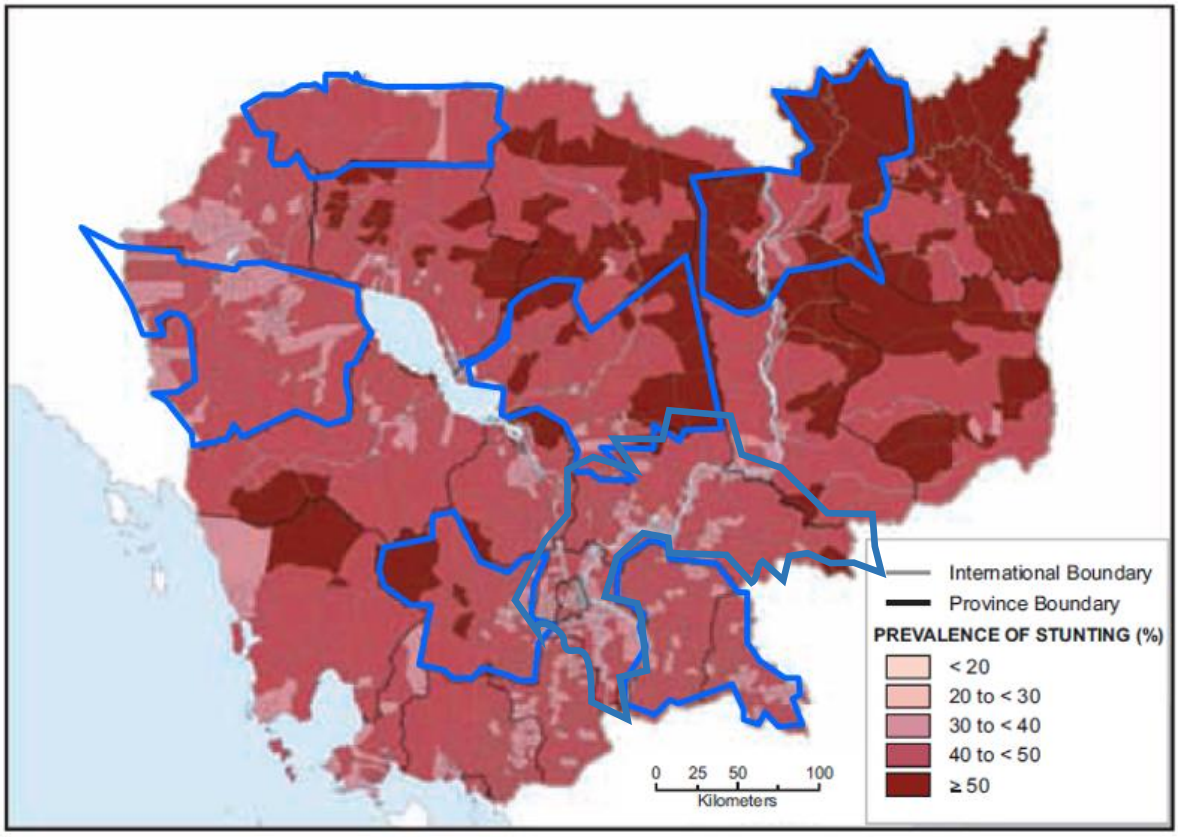
G.8.4. Provinces and districts with high stunting prevalence

Figure 6: Commune-level estimate of stunting rates and UNICEF RWS intervention areas 2006–2015



Sources: World Food Programme and the Government of Cambodia Ministry of Planning 2004; and UNICEF, 2017.

Figure 7: Commune-level estimate of stunting prevalence and UNICEF RWS intervention areas 2006–2015

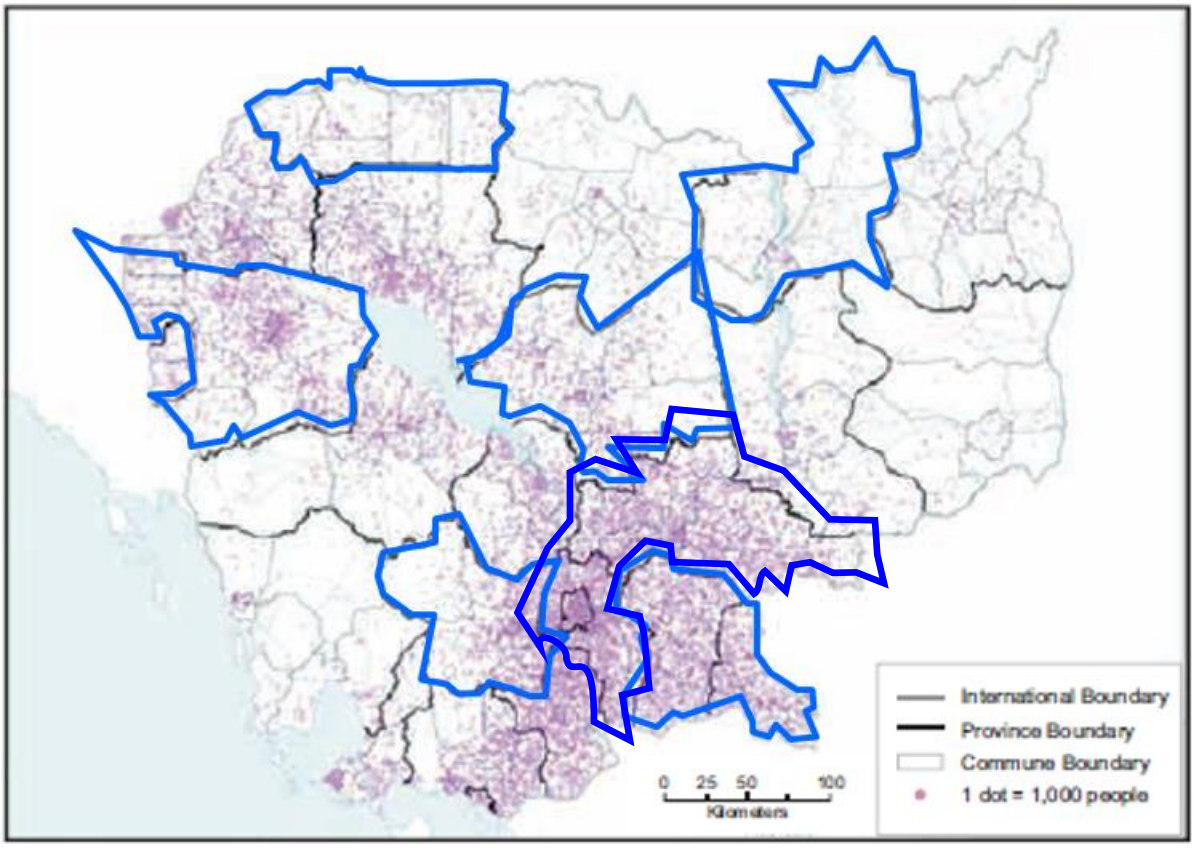


Sources: World Food Programme and Government of Cambodia Ministry of Planning, 2013; and UNICEF, 2017.

Among UNICEF's intervention provinces, only one in the north-east (Stung Treng) is among those provinces most affected by stunting (stunting data from 1998 for the first map and 2009 for the second one). This is one of the provinces that UNICEF left in 2011.

G.8.5. Population density

Figure 8: Population density and UNICEF RWS intervention areas 2006–2015

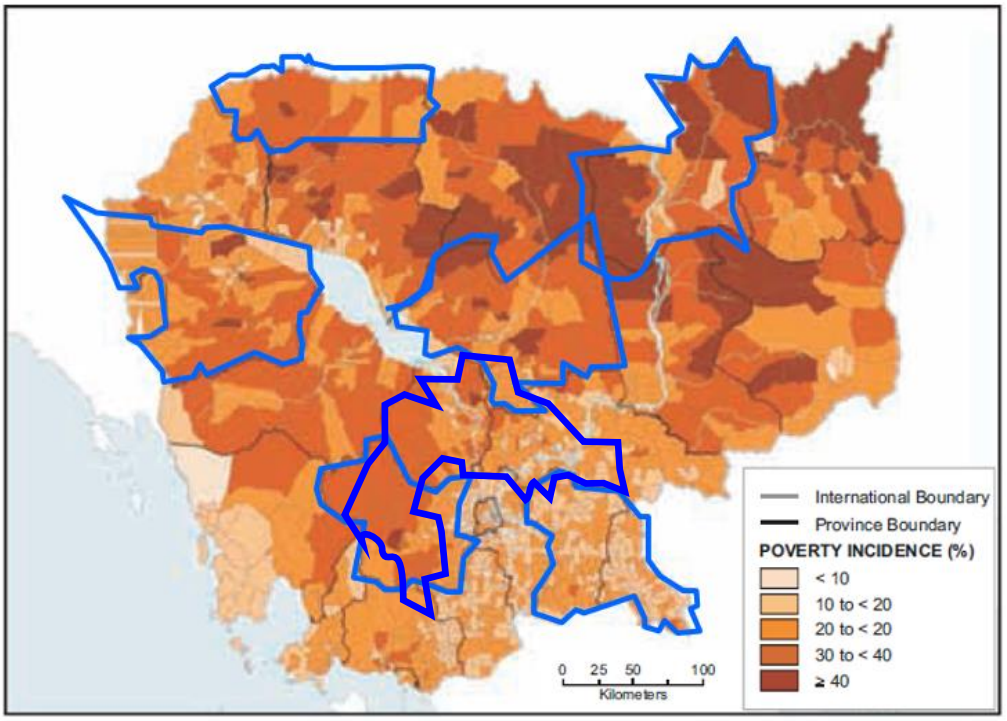


Sources: World Food Programme and Government of Cambodia Ministry of Planning, 2013; and UNICEF, 2017.

Figure 8 illustrates Cambodian population density in 2008 (as per a 2013 map based on data from the World Food Programme and the Ministry of Planning) and UNICEF's main RWS intervention areas over the evaluation period. The map shows that six intervention provinces are among the most densely populated, three are moderately populated and one is among the least populated with remote communities (Stung Treng). The latter province was left by UNICEF in 2011.

G.8.6. Poverty incidence at province and district levels

Figure 9: Poverty incidence at commune level and UNICEF RWS intervention areas 2006–2015

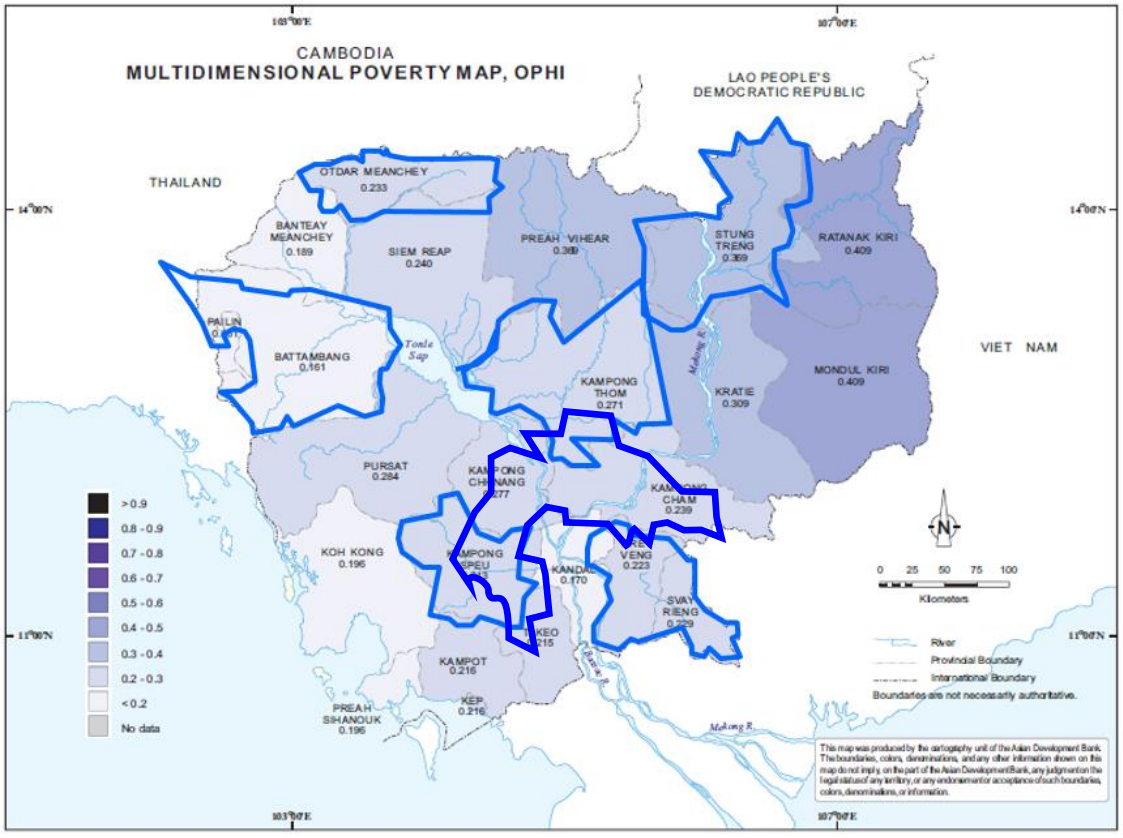


Sources: World Food Programme and Government of Cambodia Ministry of Planning, 2013 (based on 2009 data); and UNICEF, 2017.

Figure 9 compares UNICEF's main RWS intervention areas over the evaluation period with the incidence of poverty by district and commune in 2009. Stung Treng was the only UNICEF RWS intervention province among the five poorest provinces in the country in 2009. UNICEF stopped implementing RWS programming in this province in 2011, further reducing its poverty focus.

G.8.7. Multi-dimensional poverty

Figure 10: Multi-dimensional poverty index by province and UNICEF RWS intervention areas 2006–2015



Sources: University of Oxford, Oxford Poverty and Human Development Initiative, 2013; and UNICEF, 2017.

Figure 10 compares UNICEF's main RWS intervention areas over the evaluation period with the incidence of multi-dimensional poverty by province (2013 data). The two (north-)eastern provinces of the country – Ratanakiri and Mondulkiri – are the provinces with the highest levels of multi-dimensional poverty but were not covered by UNICEF RWS programming. One intervention province had a relatively high level of multi-dimensional poverty (Stung Treng, left by UNICEF in 2011), four had a moderate level and one a relatively low level of multi-dimensional poverty (Battambang).