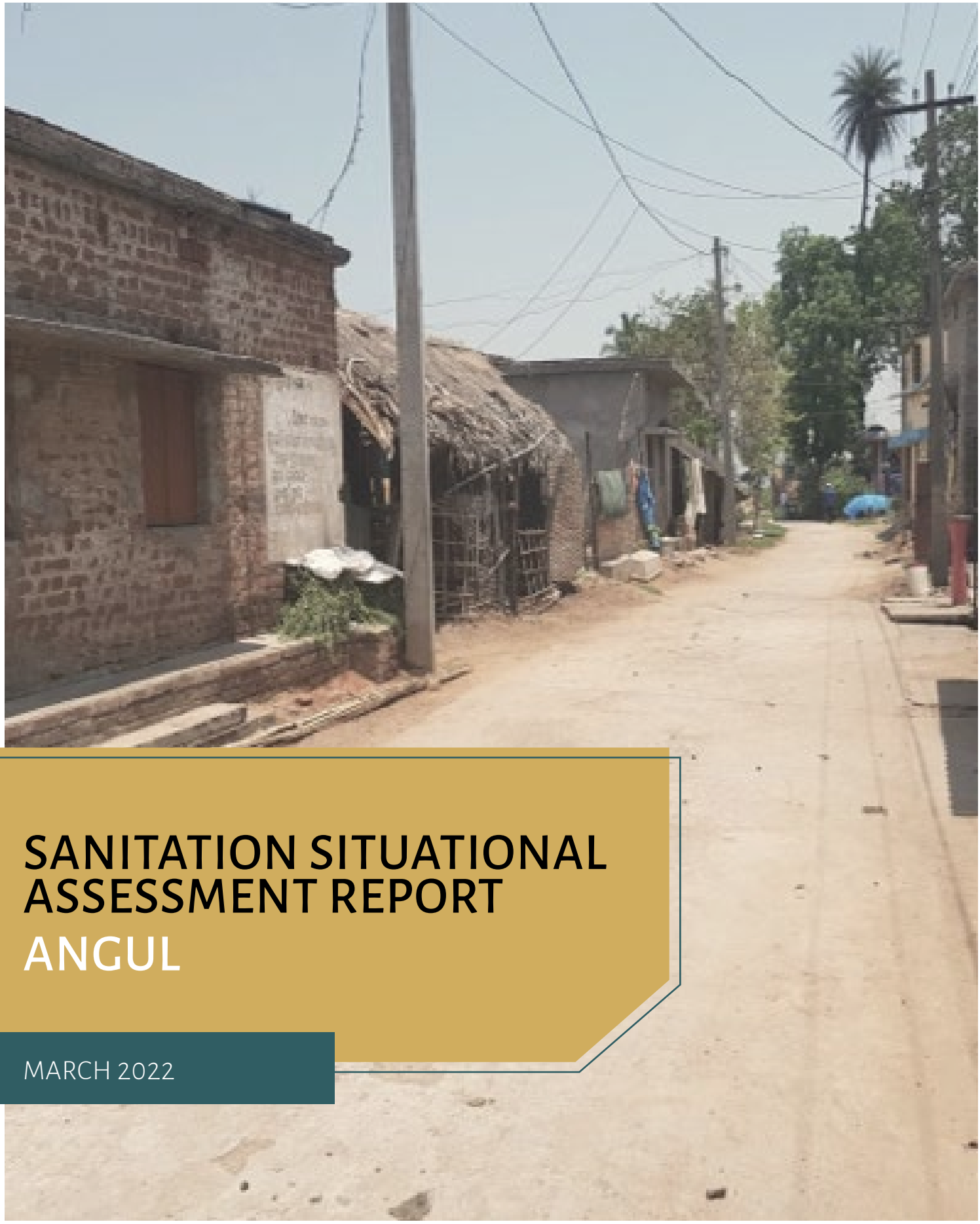

SANITATION SITUATIONAL ASSESSMENT REPORT

ANGUL

MARCH 2022

unicef for every child

CENTRE FOR POLICY RESEARCH

SCI-FI SCALING CITY INSTITUTIONS FOR INDIA WATER SANITATION

SANITATION SITUATIONAL ASSESSMENT REPORT
ANGUL

MARCH 2022

Acknowledgement

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1. INTRODUCTION

India's urbanization is on the rise, but the country is predominantly rural with 833 million (~70%) residing in villages (Census 2011). Health and sanitation have been a part of the development agenda of the Government of India since independence when the first Five Year Plan (1951-1956) recognized these as priority areas and, subsequently, National Water Supply and Sanitation Programme was launched in 1954. However, concentrated efforts specific to rural sanitation were realized mainly during the 1980s, the International Drinking Water Supply and Sanitation Decade. India launched the Central Rural Sanitation Programme in 1986 to increase access to sanitation among rural households, but the Programme met with only limited success. Subsequently, it was followed by many other national and state-level initiatives with similar objectives, like Integrated Low-Cost Sanitation Program, Total Sanitation Campaign, Nirmal Gram Puraskar, and the latest Swachha Bharat Mission, over the years.

As per the Census of India 2011, despite nearly two decades of efforts, only 31% of rural households had access to an in-house toilet; 2% of all households relied on public toilets while a whopping 67% practiced open defecation. With the onset of SBM – Gramin (SBM-G) in 2014, rural areas witnessed a large-scale and mission-mode drive to construct subsidized individual household toilets. The programme achieved the construction of ~107 million rural toilets and 711 out of total 712 districts declared themselves Open Defecation Free (ODF) between 2014-2021 . Understanding that access to toilets is only the first step to safe sanitation outcomes, the Ministry of Jal Shakti launched SBM-G Phase II in 2020 with two main goals - ODF Sustainability and ensuring effective Solid and Liquid Waste Management (SLWM), including Faecal Sludge Management (FSM) in every Gram Panchayat (rural local body) of India.

Odisha, with a rural population share of 83%, reported toilet access among rural households to be merely 14% in 2011. Since 2014, under SBM-G, the state has built 6.6 million rural toilets and all the 30 districts had declared themselves ODF. To further leverage these gains made by the state, the Chief Minister outlined a vision of a 'Swachh Odisha, Sustha Odisha' in 2018. In response to the call, the Panchayati Raj and Drinking Water Department issued a state-wide Rural Sanitation Policy in 2020 – one of the first such initiatives in the country.

Within this context and in line with the imperatives of both the SBM-G Phase II and Odisha's Rural Sanitation Policy, the district of Angul is undertaking an endeavor to attain district-wide safely Managed Sanitation. The Angul Municipality, also serving as the district's headquarters, is already a pioneer in urban FSM in smaller towns having successfully demonstrated a citywide FSM system including a low-cost and nature-based Faecal Sludge Treatment Plant (FSTP). Now, with support from its partners - UNICEF and the Centre for Policy Research (CPR), the district is exploring complementary strategies, one of which leverages the existing FSTP along with other wastewater treatment facilities, to extend FSM services to all the rural households in the district. Since FSM refers to the safe collection, containment, conveyance, and treatment of faecal sludge resulting from toilet usage, the district's initiative is critical to ODF Sustainability and 'sustha and swachha' villages.

The present report evaluates the existing sanitation situation in the rural areas of the Angul district to understand the prevailing gaps towards achieving safely managed sanitation that the endeavor must seek to address. Secondly, the assessment seeks to analyse the scope of utilizing the operational wastewater treatment facilities (FSTPs/STPs) in the urban areas and industrial townships of the district to cater to the rural need. It also includes the relevant contextualizing information on the administrative, demographic and geographic landscape of the district.

[1] Retrieved from http://sbm.gov.in/sbm (India Ministry of Drinking Water and Sanitation, 'Swachh Bharat Mission-Gramin')

Structure of the report

The report is divided into six sections. The introduction, which highlighted the need and objective of the report, is followed by Section 2, giving the administrative overview of the district. Section 3 details the geographic profile, including climate, land use, and water bodies of the district, and Section 4 presents its demographic characteristics. Section 5 dives into the current sanitation situation in the rural areas and also presents details of the currently operational wastewater treatment facilities in the district. Lastly, Section 6 concludes the report by deliberating on the future of FSM services in the Angul district.

2. ADMINISTRATIVE PROFILE

a. Horizontal and vertical hierarchy of administrative units

Angul district is further subdivided into four subdivisions and eight blocks. The district has two statutory towns viz. Angul and Talcher, one notified area council (NAC) viz. Athamallik, 15 census towns and 1930 villages (1661 inhabited villages and 269 uninhabited villages). These villages are organised into 225 Gram Panchayats (GPs, or rural local bodies) with an average of nine villages per GP. The smallest GPs in the district comprise 1-2 villages, while the largest have upwards of 23-24 villages. Concerning political administration, the district has five assembly constituencies and two parliamentary constituencies (cumulatively with Sambalpur and Dhenkanal). Angul Municipality serves as the district headquarters. In addition to Angul, Talcher, and Athamalik, the district is home to multiple industrial townships, all of which have their own administrative structure.

FIGURE 1: Map showing administrative divisions of Angul district

TABLE 1: Administrative structure of Angul district

Sub-division	Block	Gram Panchayats (GPs)	Villages	Urban Local Bodies (ULBs)	Industrial Townships
Angul	Angul	34	230	Angul (M)	
	Banarpal	35	156		NALCO
	Chhendipada	34	184		JSPL
Athamallik	Athamallik	24	351	Athamallik (NAC)	
	Kishorenagar	23	251		
Pallahara	Pallahara	27	205		
Talcher	Talcher	21	234	Talcher (M)	NTPC, MCL
	Kaniha	27	319		NTPC
Total	8	225	1930	3	

SOURCE: https://angul.nic.in/

b. Sanitation Organizational Structure

The administrative structure for the rural areas in Odisha is a multi-tiered set-up with the Panchayati Raj & Drinking Water Department (PR&DWD), Government of Odisha (GoO), at the top. The various stakeholders have a specific role to play at every level of the hierarchy (Table 2). At the local level, GPs empowered to function as units of self-government (73rd Constitutional Amendment), with support from their committees like Village Water and Sanitation Committees (VWSCs), Gaon Kalyan Samiti, etc., oversees water and sanitation delivery. In the same vein, the Odisha Rural Sanitation Policy (2020), recognizes GPs as the institution responsible for implementing the policy guidelines in the state under the overall guidance of PR&DW.

TABLE 2: Sanitation organizational structure and roles of various stakeholders

Administrative level	Stakeholders	Primary Functions
State-level	Chief Secretary, GoO	Policy guidance, approval of schemes, periodic implementation review, evaluation of physical and financial progress, resource management
	Principal secretary, PR&DW	
	Director, Water and Sanitation, PR&DW	
	Engineer-in-chief, RWSS, Chief engineer	
	Superintendent engineer	
District level	Executive Engineer	Planning, review & implementation of schemes, interaction with SWSM community members, district-level IEC, management of program funds
	Zilla Panchayat/District water and sanitation mission, headed by district	

SOURCE: Singh, T & Dwivedi, A. 2020. 'Stakeholder Analysis Report for SLWM project in Dhenkanal'. CPR Report. New Delhi: Centre for Policy Research

Administrative level	Stakeholders	Primary Functions
Block-level	Deputy Executive Engineer	Coordination of implementation of schemes at the block level, maintenance of scheme funds, maintenance of a supply of spare for scheme operations
	Junior Engineer	
	Block Panchayat	
Gram Panchayat level	Gram Panchayat	. Progress review, recommendation of schemes to DWSC, IEC campaigns for community awareness . Work with NGOs, CBOs and local entrepreneurs in generating demand and effecting supply for rural water and sanitation interventions.
	Village Water and Sanitation Committee	

c. Economy

Angul is rich in minerals like coal, chromite, graphite, manganese, mica, kyanite, granite, laterite, sandstone, quartz, etc. The district is home to 11 coal mines that cover an area of ~10474 hectares in total, a sandstone mine with an area of 17.5 hectares and a quartz mine with that of 10.7 hectares[2]. The district also hosts various large-scale industries related to metals like aluminum and steel, including five public sector undertakings (PSUs). Resultingly, around 9% of the district population resides in the industrial townships attached to these mega-industries (Census 2011). Some of the major townships are National Thermal Power Corporation (NTPC, Kaniha), Jindal Steel and Power Limited (JSPL, Chendipada), National Thermal Power Corporation (NTPC, Talcher), TATA steel BSL, Mahanadi Coal Field Ltd (MCL, Talcher) and National Aluminum Company (NALCO, Banarpal). The industrial units have their own internally-designed governance structures, rules, and regulations to manage their respective township.

TABLE 3: Mega Industrial Units in the district of Angul

Sector	Name of the unit	Location	Production
Public sector	Mahanadi Coal Field Ltd. (MCL)	Talcher	Coal
	National Aluminium Company (NALCO)	Nalco Nagar, Banarpal	Aluminium
	National Thermal Power Corporation (NTPC)	Kaniha	Thermal Power
	Talcher Thermal Power Station (TTPS)	Talcher	Thermal Power
	Heavy Water Project	Vikrampur, Talcher	Heavy Water
Private sector	Shree Metalics Ltd	Makundapur, Chendipada	Sponge Iron
	Jindal Steel & Power Ltd.	Chendipada	Steel
	Jindal India Thermal Power Ltd.	Kaniha	Thermal power

SOURCE: https://angul.nic.in/

[2] Brief Industrial Profile of Angul District (2019-20), MSME-Development Institute, Ministry of MSME, GOI

3. GEOGRAPHIC PROFILE

a. Location:

The district of Angul was earlier a part of the Undivided Dhenkanal district. It came into existence as a separate district on April 1, 1993, with Sundargarh district in the north, Sambalpur in the west, Kandhamal and Cuttack in the south and the Keonjhar district in the east. Covering an area of 6,375 square kilometers (sq. km), it is located in the central part of the state.

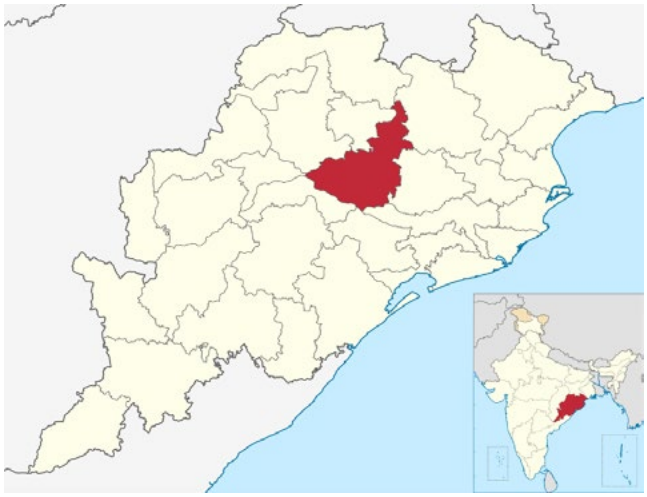
b. Climate:

As per categorizations of agro-climatic condition, the district falls under the mid-central tableland[3] and lies 300 meters above the mean sea level. The climate is moderately humid with dry and hot summers followed by wet and humid monsoon and mild winter. The district receives an annual average rainfall of 1401.9 mm with a high year-to-year variation. It comes under 'Moderate cyclone damage risk zone-A (Wind speed=44m/s)'.

c. Land-use:

The total cultivable area of this district is 2113 sq. km, covering 33% of its total geographical area. Around 49% of the cropped area is rain-fed and the rest is irrigated[4]. The soil of the district is primarily red lateritic, sandy & alluvial in nature. The major crops of the kharif season are paddy, maize, ragi, oilseeds, pulses, small millets, and vegetables, etc. Paddy, wheat, maize, field pea, sunflower, garlic, ginger, potato, onion, tobacco, sugarcane, coriander, etc. are the major rabi crops. The total area under forest is 2717 sq. km (42.6% of total area)[5].

FIGURE 2: Map of Odisha showing location of Angul district



d. Surface water:

Brahmani and Mahanadi are the two major rivers flowing through the district. While Mahanadi demarcates the district's southern border, Brahmani passes through the middle of the district, primarily the Talcher sub-division. Both these rivers have numerous perennial and non-perennial tributaries. Most of the district lies within the Brahmani basin, while the Mahanadi basin spreads over the Athmalik subdivision and the southern part of the Angul sub-division. A multi-purpose dam has been constructed over the Brahmani at Rengali.

Water pollution of Brahmani river has been of concern lately. In 2015, the Central Pollution Control Board (CPCB) directed the Odisha State Pollution Control Board (OSPCB) to monitor the pollution levels of the Brahmani river. According to the state authorities, discharge of domestic wastewater from townships and in-stream uses by people are significant contributors to the pollution[6]. Another study found high turbidity in the Brahmani river

[3] An agro-climatic zone of Odisha covering Angul, Dhenkanal, parts of Cuttack and Jajpur. It exhibits hot and moist climate and is rich in alluvial, red and lateritic soil.

[4] District Irrigation Plan of Angul, 2016

[5] Retrieved from https://angul.nic.in/

[6] Bid to check pollution in Brahmani River, The Hindu (published on 10 Nov 2015). Retrieved from: https://www.thehindu.com/news/national/other-states/bid-to-check-pollution-in-brahmani-river/article7863088.ece (last accessed on 22 Dec 2021)

and increased content of iron and nitrate. It attributed the high pollution levels to untreated wastewater and sewage disposal from the towns of Rengali and Talcher and also to industrial effluents[7].

e. Groundwater

The Central Groundwater Board's Assessment Report 2020 has categorized the groundwater development in all the eight blocks of Angul as 'safe'. In 2020, depth to groundwater during the pre-monsoon period (April) ranged between 2.30 to 13.59 meters below ground level (mbgl) while in the post-monsoon period (November) it ranged between 0.11 to 8.4 mbgl. Compared to April 2019, 64.39% of the wells recorded a fall in water level in April 2020. Similarly, compared to November 2019, 43.35% of the wells recorded a fall in water level in November 2020. Moreover, Angul is one of the most affected districts for flouride concentration. Kukurang village in the district recorded fluoride levels as high as 3.34 mg/l, the second highest in Odisha[8]. (Nath, Tripathy, & Das, July-2018)

FIGURE 3: Groundwater map for Angul district

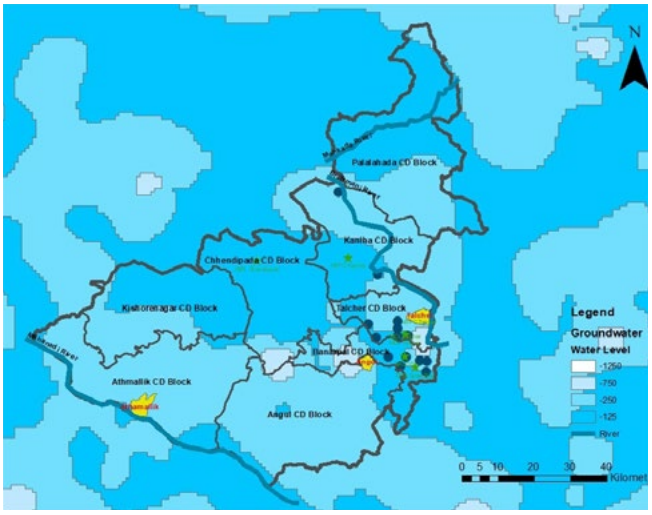


TABLE 4: Mega Industrial Units in the district of Angul

Month-Year	Total no. of wells monitored	Depth to water level (mbgl)		Number and percentage of wells showing depth to water level (mbgl) in the range of			
		Min	Max	0-2	2-5	5-10	10-20
April 2020	59	2.30	13.59	0 (0%)	12 (20%)	42 (71%)	5 (9%)
August 2020	57	0.15	7.48	39 (68%)	14 (25%)	4 (7%)	0 (0%)
November 2020	53	0.11	8.4	21 (40%)	26 (49%)	6 (11%)	0 (0%)
January 2021	59	0.11	10.85	4 (7%)	31 (53%)	22 (37%)	2 (3%)

SOURCE: Groundwater Yearbook 2020-21-Odisha http://cgwb.gov.in/Regions/SER/Reports/YEAR%20BOOK%202020-2021.pdf

[7] Nath, D. T., Tripathy, B., & Das, A. (July-2018). A Study of Water Quality of River Brahmani, Odisha (India) to Assess its Potability. International Journal of Engineering Research & Technology (IJERT), Vol. 7 Issue 07.

[8] Groundwater Yearbook-Odisha (2020-21)

4. DEMOGRAPHIC PROFILE

As per the Census of India 2011, the district has a total population of ~12.7 lakh (or 2.97 lakh households) of whom 92% reside in rural areas (including census towns, which are administratively rural) and 8% in urban areas. The total district population grew at a decadal rate of 11.74% during 2001-11. Research shows that access to toilets and different types of on-site sanitation (OSS) systems varies across villages in relation to their population sizes and densities with 'Large and Dense Villages'[9] (LDVs), like Census Towns, exhibiting urban-like characteristics. These LDVs form roughly 57% of the total rural population of India. These areas have shown higher access to toilets and increased reliance on OSS compared to the rest of the villages. Thus, though they are administratively rural, they exhibit urban-like characteristics, making them crucial areas for FSM intervention. In the case of Angul district too, only 9% of total rural toilet-owning households have a septic tank and 2.4% have ventilated improved pit (VIP), compared to LDVs where the share of septic tank and ventilated improved pit is 62% and 13%, respectively.

The district has a work participation rate of 41% (block-wise and gender-wise details are given in the annexure). Also, 19% of the rural population of the district belongs to the Scheduled Caste category, while 15% belong to that of Scheduled Tribe.

TABLE 5: Demographic details

Female Population	**Male Population**	**Rural Population**	**Urban Population**
51.5%	48.5%	92%	8%
Population Growth (2001-11)	**Population density** (per sq. km)	**Total literacy**	**Female literacy**
11.74%	200	68.3%	60.7%
Male literacy	**Sex ratio** (per 1000)	**% SC population**	**% ST population**
75.4%	200	68.3%	60.7%

SOURCE: https://angul.nic.in/

[9] CPR's research that coined the 'LDV' terminology defines these as villages with a population greater than 1,000 and a density of 400 persons per square kilometers.

TABLE 6: Demographic profile of different blocks

Block Name	Total Population	% Rural Population (including CTs)	% Urban Population	LDV Population (% Share of rural pop.)
Anugul	210556	79%	21%	118670 (71%)
Athmallik	122850	90%	10%	2412 (2%)
Banarpal	209465	100%	0%	91113 (43%)
Chhendipada	166751	100%	0%	45903 (28%)
Kaniha	143109	100%	0%	44257 (31%)
Kishorenagar	107821	100%	0%	7012 (7%)
Palalahada	129806	100%	0%	11196 (9%)
Talcher	183463	78%	22%	110049 (77%)
Total	1273821	92%	8%	430612 (37%)

SOURCE: Census 2011

5. SANITATION STATUS

a. District-level figures for Water and sanitation

The data have been sourced from:

- Swachh Bharat Mission (Gramin) database which also includes the baseline survey done in 2014 besides providing updated figures on the number of toilets constructed year-wise and details on the type of OSS structure.
- District-survey data comprising of district-level sanitation figures. The data used was last updated in May 2021.

Baseline sanitation survey in 2014 found that the share of households in rural Angul with access to an in-house toilet was 11%. This deficit was purportedly met under the SBM-Gramin. During the programme, the district undertook the construction of more than 2 lakh toilets till 2019-20 (block-wise figures are given in the annexure) and declared all its villages as ODF. While an improved water supply has often been studied as a positive influencer of toilet usage and sanitation practices[10], till August 2019, piped water connections were limited to only 4% of the rural households. Under the Jal Jeevan Mission[11], 1.26 lakh new water connections have been added, taking the total households with piped water supply (PWS) to 51% in 2021. A total of 253 villages now have every household with a piped connection[12].

Both the district survey and SBM(G) data show a high proportion of single pits across the district. In addition, a higher proportion of septic tanks (+12%) were also reported during the baseline survey. These figures are crucial for estimating rural demand for FSM services in the coming years.

[10] Saxton, R.E., Yeasmin, F., Alam, M.-U., Al-Masud, A., Dutta, N.C., Yeasmin, D., Luby, S.P., Unicomb, L. and Winch, P.J. (2017), If I do not have enough water, then how could I bring additional water for toilet cleaning?! Addressing water scarcity to promote hygienic use of shared toilets in Dhaka, Bangladesh. Trop Med Int Health, 22: 1099-1111. https://doi.org/10.1111/tmi.12914; Bauza, Valerie et al. "Child Defecation and Feces Disposal Practices and Determinants among Households after a Combined Household-Level Piped Water and Sanitation Intervention in Rural Odisha, India." The American journal of tropical medicine and hygiene vol. 100,4 (2019): 1013-1021. doi:10.4269/ajtmh.18-0840

[11] The Jal Jeevan Mission is an ongoing government programme aimed at providing household-level tapwater connections by 2024 to all households in rural India.

[12] Retrieved from https://ejalshakti.gov.in/jjmreport/

FIGURE 4: Progress made under SBM(G) in Angul district

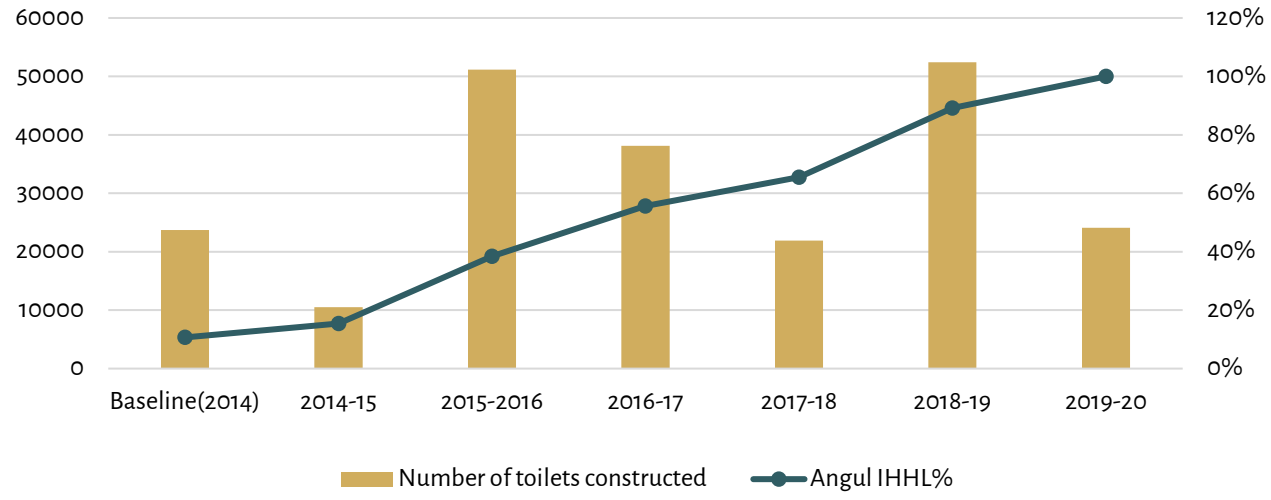


FIGURE 5: Type of toilet-District survey data[15]

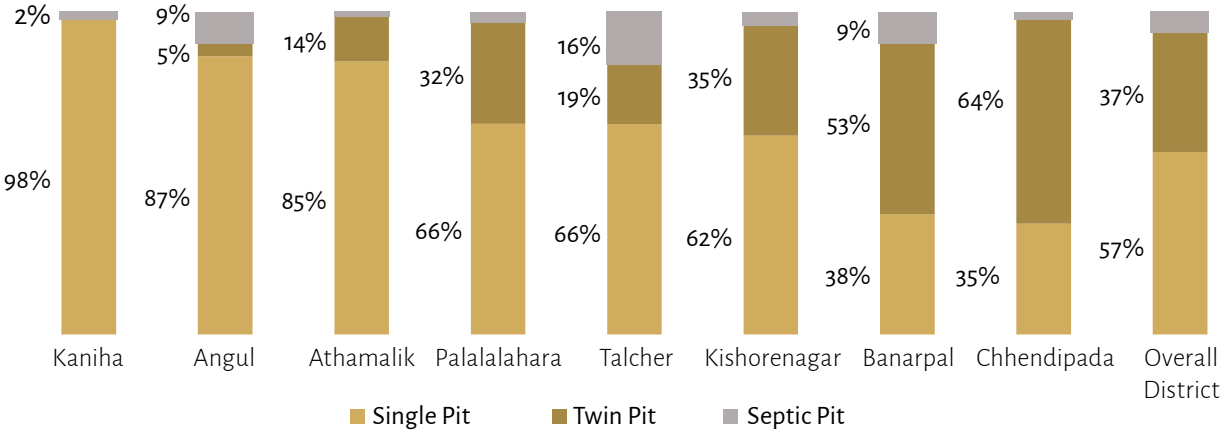
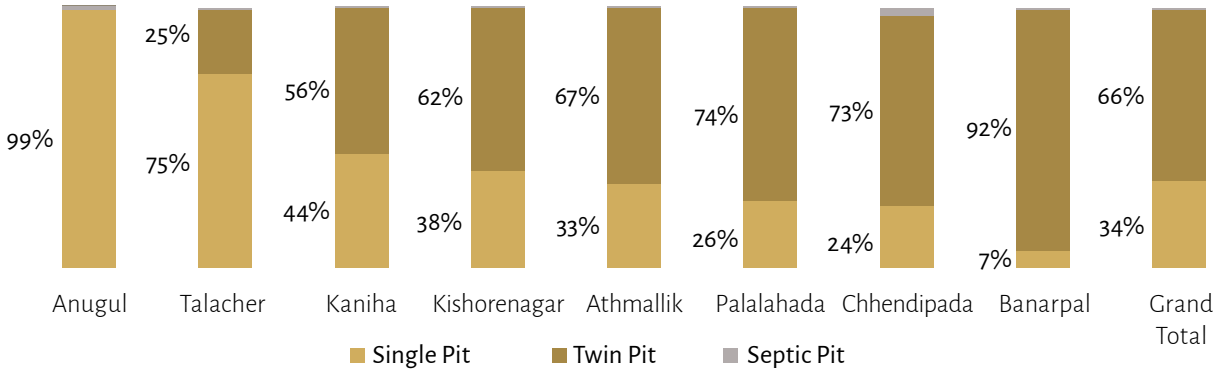


FIGURE 6: Type of toilet-SBM (G) IMIS data [16]



[13] Based on data for 1,05,240 HHs, i.e. ~68% of total households surveyed with toilet access & excluding indecipherable values.

[14] Based on data for 49% of total households listed for which OSS data available; overall data available for 2,33,359 households or 93% of all households enumerated during Census 2011.

b. Status of current FSTP drive

Angul FSTP

The Angul district is home to one of the first early and successful pilots on the integration of FSM into the citywide sanitation value chain. Under Project Nirmal, a collaborative project with HUDD (Government of Odisha), District Administration and Municipalities, Practical Action (Bhubaneshwar), and Centre for Policy Research (Delhi) as partners along with funding from Bill and Melinda Gates Foundation (BMGF) and Arghyam, the Angul Municipality operationalized a low-cost and nature-based FSTP with a capacity of 18 kiloliters per day (KLD) in January 2020. It has been designed with a 10-year horizon to serve the projected 16,221 households by 2030.

For desludging, the ULB operates two vehicles of 3 kiloliters (KL) and 1 KL capacity each and another two 4 KL vehicles being run by a registered private desludging service provider. The latter is solely serving the rural areas. The four vehicles together conducted 879 desludging trips between Jan 2020 - May 2021 - of which 24% were rural and 76% urban. Overall, ULB-operated vehicles have undertaken more than 80% of the total trips for a given month in 3 out of 9 months for which data has been analyzed. When it comes to vehicle utilization, the average number of trips per day for a given month shows wide variation with October recording the lowest average value.

The municipality has adopted a graded tariff structure with the rate per trip increasing based on the spatial location of the households – the rate is constant with the ULB boundary for a given vehicle, but successively increases with the distance from the ULB.

FIGURE7: Angul FSTP design

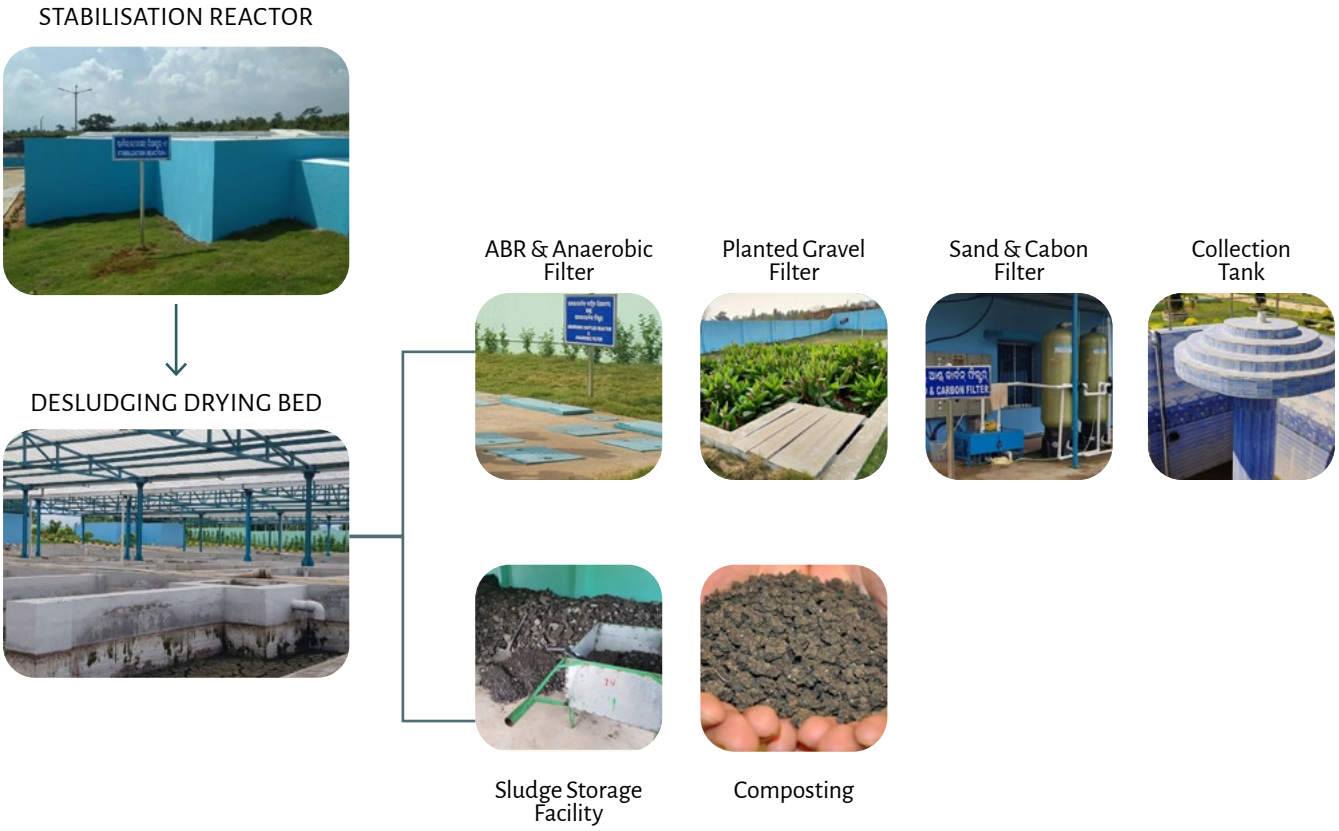


TABLE 7: Desludging rates based on the distance from the ULB

Capacity of Vehicle (in litres)	Rate per Trip		
3,000	Within ULB Jurisdiction	Up to 10 km beyond ULB area	10-20 km beyond ULB area
	1,200	1,700	2,400
1,000	800	1,300	2,000

FIGURE 8: Number of trips by desludging vehicles

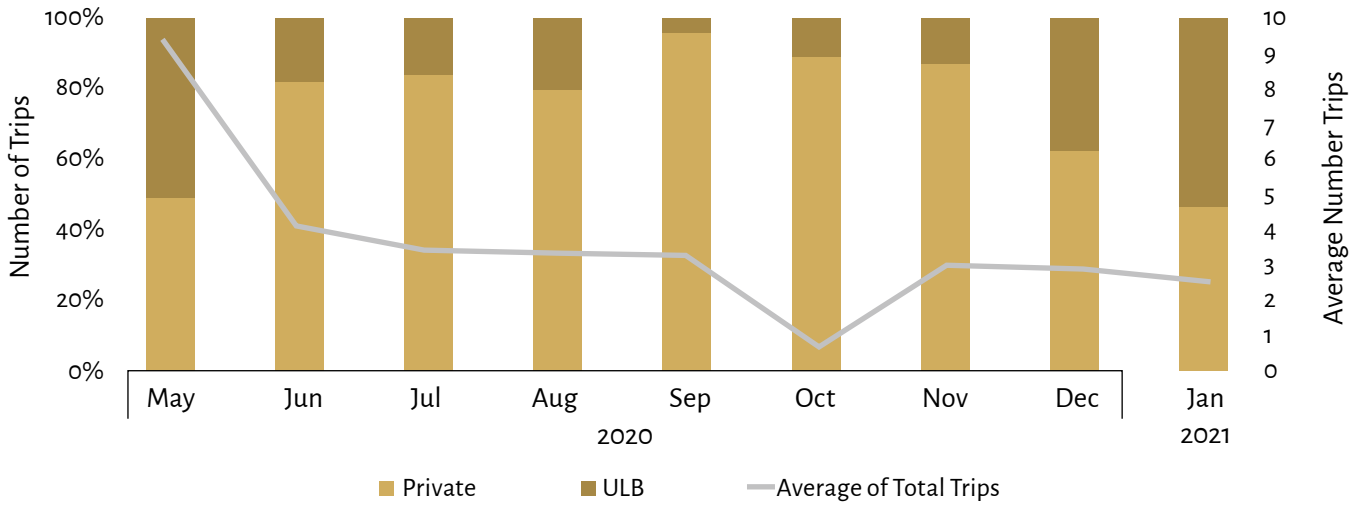
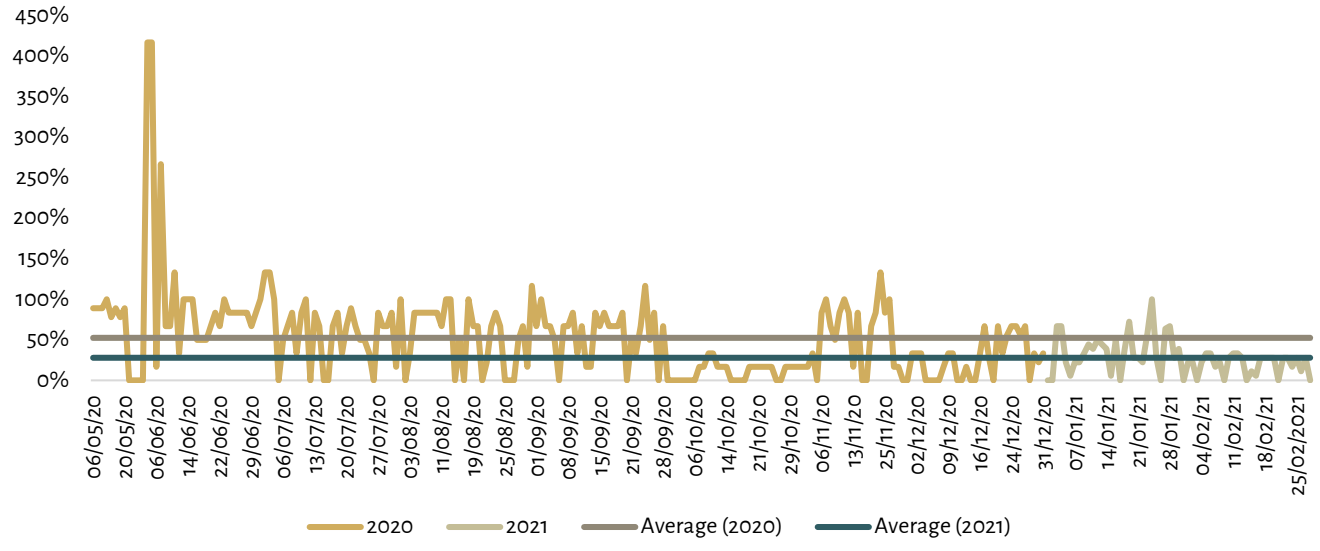


FIGURE 9: Capacity utilization rate of Angul FSTP



Currently, the capacity utilization rate of the Angul FSTP is low with an average of around 52% in 2020 and close to 28% in 2021 (till February). Day-to-day fluctuations in utilization levels lead to capacity being over-utilized on certain days.

Talcher FSTP

A second FSTP in the district, at Talcher Municipality, has been constructed by H&UDD as part of its initiative to scale up the FSM in all ULBs across the state. It has been designed with a capacity of 20 KLD to serve a population of 56,742 (11,348 HHs) over a 20-year horizon (with an interval of 10 years). At the time of writing the present document, the FSTP was under a trial run and a single desludging vehicle of 3 KL was being operated by the ULB in the area.

A third FSTP is currently under construction at the Athamallik NAC.

c. Status of sanitation in Industrial Townships

A field visit was undertaken by the CPR team and district officials in August 2021 to various townships situated in the Angul district. The objective was to understand the existing wastewater treatment facilities and assess any possibility of utilising their facilities by neighbouring villages. 6 major industrial townships were visited, each comprising of a population of around 5000 and above. The wastewater treatment plants of the townships have capacities ranging from 1MLD to 5 MLD and have a sewerage network or gravity flow & pumping system for conveyance. The existing STPs of all the industrial houses are running close to full capacity, except TATA steel BSL which at present is utilizing 56% capacity, however, it is expected to function at its full strength once the new blocks of the township are integrated into the system. The complete set of observations and collected information have been compiled in the table below.

TABLE 8: Sanitation status in Industrial Townships in Angul district

Township Name	NTPC-Kaniha	JSPL	NTPC-Talcher	TATA Steel BSL	MCL	NALCO
Name of the Industry	Talcher Super Thermal Power Station	Jindal Steel & Power Limited	Talcher Thermal Power Station	Tata Steel BSL Ltd	Mahanadi Coalfields Limited	National Aluminium Company Limited
Type of Industry	Power	Integrated steel & power	Thermal Power Plant	Steel	Coal Mines	Metallurgical industry
Name of the Block	Kaniha	Chendipada	Talcher	Odapada	Talcher	Banarpal
Total Township Population	~5500	6000	2800 inhabitants + 1450 workers	4591	8028	15000
Quantity of Domestic Wastewater Generated (MLD)	~2400	1500	2640	550.92	1160	~5500
Type of System for Domestic Wastewater Treatment	STP*	STP	STP	Combined- STP Cum FSTP	STP	STP
Type of System for Conveyance of Domestic Wastewater	Sewerage Network	Sewage network & desludging vehicle	Gravity flow & Pumping system	Sewerage Network	Gravity Flow and pumping system	Closed-loop sanitary sewer system

Total Capacity of Treatment Plant (MLD)	4 MLD	2 MLD	2.65 MLD	1 MLD	2 STP (1.5 + 0.5) = 2 MLD	5 MLD
Average capacity utilisation in last six months/1 year	Upto 90-100%	75%	100%	56%	98%	100%
Township Name	NTPC-Kaniha	JSPL	NTPC-Talcher	TATA Steel BSL	MCL	NALCO
The technology used in the treatment plant	Extended aeration activated sludge process	MBBR	Extended aeration activated sludge process	MBBR Technology	Extended aeration activated sludge process	Aerobic Biological Treatment
Current disposal method for treated water / solid	Horticulture and Plantation	Irrigation of green belt	Horticulture	Horticulture and & ETP (Plant Operations)	Horticulture	Horticulture and cleaning purpose. Solids from SDB used for landfilling in low lying areas.

* A new Active Filter Media (AFM) based Tertiary treatment plant (2 MLD capacity) is under process of implementation inside the STP area and the treated water will be used for CW System inside the plant.

6. DISCUSSION AND CONCLUSION

Swachh Bharat Mission has improved access of rural house¬holds to sanitation facilities. Due to the inherent nature of the dominant OSS systems accompanying the toilets. viz. single pits and septic tanks, the district is confronted with the need to contemplate the gaps in achieving safely managed sanitation beyond the toilet. While retrofitting single pits to the twin pit system, as recommended under the SBM-G Phase II, could work as a solution in specific pockets of the district, it is not a universal solution due to the high groundwater table underlying it. Therefore, the district must adopt safe and scientific FSM as an alternative strategy to achieve safely managed sanitation.

At the time of writing the report, the district had a single operational FSTP built under Project Nirmal in the Angul municipality, one in trial run, and another under construction. The first of these has been catering to urban households and peripheral rural households, albeit informally. Since the FSTP at Angul municipality has been operating below capacity and already serves rural demand, it could be successfully leveraged for a formal extension of FSM services to nearby GPs. While a second option could have been to utilize wastewater treatment facilities of various industrial townships of Angul to similarly provide services to surrounding GPs, it is infeasible since the initial assessment shows that most of these facilities are running close to capacity.

Going forward, the district should conduct a detailed feasibility assessment, including a capacity building needs assessment, to ascertain the appropriate model for institutionalizing urban-rural convergence for FSM (some work has already been initiated in this direction; refer Annexure 2). Similarly, it would need to segment the remaining GPs into those where retrofitting is feasible and those which need Greenfield development of FSM infrastructure.

ANNEXURE 1:
Supplemental demographic information

TABLE 9: Block-wise population share of SC & ST and `number of SC-dominated and Tribal villages (pop. within category > 50%)

Block Name	% SC Population (Rural)	% ST Population (Rural)	SC-dominated Villages (% share)	Tribal Villages (% share)
Anugul	20%	11%	18 (8%)	39 (17%)
Athmallik	16%	24%	8 (2%)	85 (24%)
Banarpal	22%	4%	28 (18%)	8 (5%)
Chhendipada	21%	11%	18 (10%)	19 (10%)
Kaniha	22%	8%	8 (3%)	21 (7%)
Kishorenagar	15%	20%	7 (3%)	38 (15%)
Palalahada	15%	41%	12 (6%)	134 (65%)
Talcher	20%	10%	9 (4%)	11 (5%)
Overall district	19%	15%	108 (6%)	355 (18%)

SOURCE: Census 2011

TABLE 10: Block-wise work participation rate (WPR) for main and marginal workers in Angul District (Census 2011)

Block Name	Overall WPR			Male WPR			Female WPR		
	Total	Main	Marginal	Total	Main	Marginal	Total	Main	Marginal
Palalahada	47%	20%	27%	56%	31%	25%	38%	9%	29%
Kaniha	38%	19%	19%	53%	31%	23%	21%	5%	16%
Talcher	33%	26%	7%	53%	43%	9%	11%	6%	5%
Chhendipada	47%	29%	18%	55%	42%	14%	38%	15%	22%
Kishorenagar	50%	23%	28%	57%	34%	24%	43%	11%	32%
Athmallik	52%	26%	26%	58%	38%	20%	46%	15%	31%
Anugul	38%	27%	12%	55%	43%	12%	20%	9%	11%
Banarpal	35%	27%	8%	54%	44%	10%	14%	8%	7%
Overall district	41%	25%	16%	28%	20%	8%	13%	5%	8%

SOURCE: Census 2011

TABLE 11: Bock-wise number of toilets constructed under SBM

Number of toilets constructed under SBM-G	2014-15	2015-2016	2016-17	2017-18	2018-19	2019-20
Anugul	10032	33715	1429	2332	0	0
Athmallik	13	53	6413	5245	6486	2749
Banarpal	10	161	5792	1034	10299	8193
Chhendipada	40	752	3667	1481	7063	2418
Kaniha	76	1002	4852	5156	7823	4211
Kishorenagar	100	13614	2104	1245	5561	0
Palalahada	49	1144	10284	2486	8818	4839
Talacher	217	706	3597	2909	6360	1714
Overall district (Rural)	10537	51147	38138	21888	52410	24124

SOURCE: SBM(G) dashboard https://sbm.gov.in/

ANNEXURE 2:

Next steps for planning urban-rural FSM convergence in the district

Based on the initial situational assessment in the district of Angul, a follow-up demand-supply analysis was done to ascertain the potential of the plug-in approach. The following classification of the GPs is one of the outcomes of the same.

TABLE 12: List of identified Gram Panchayats to be plugged-in to existing treatment facilities

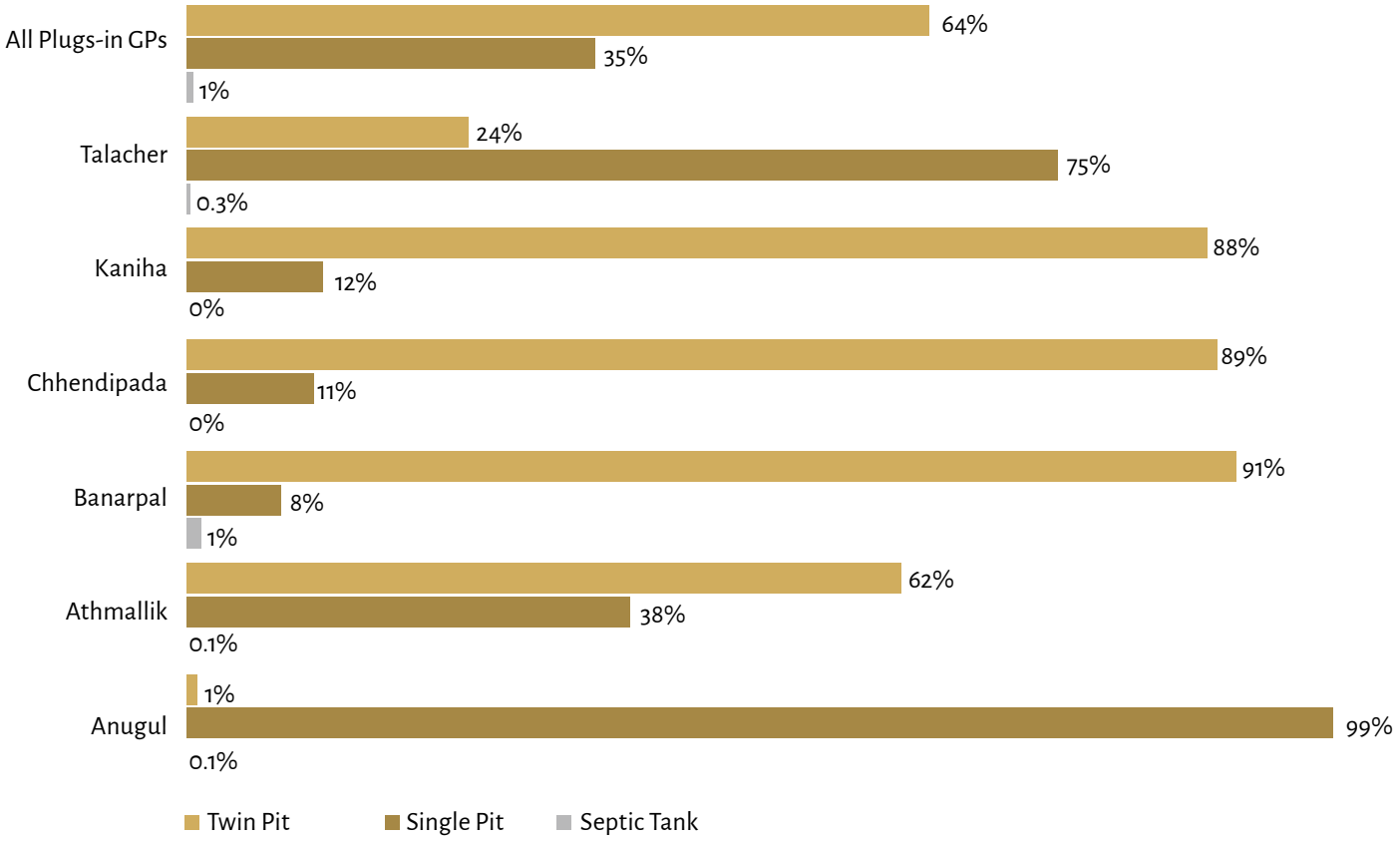
Gram Panchayats Tagged to Urban Local Bodies for Faecal Sludge and Septage Management (FSSM) in Angul District					
I	Name of Urban Local Body		Angul Municipality		
Sl. No	Name of Block	Grouping of GPs Falling under 10/15/20 Km Distance from the Urban Local Bodies			
		0-10 Km. Category- "A"	10-15 Km. Category- "B"	15-20 Km. Category- "C"	Total (A+B+C)
1	**ANGUL**	**Rantalei**	**Badakera**	**Matiasahi**	**3**
		Khalari	Angar Bandha	Inkarabandha	3
		Chheliapada	Kumurisingha	Dhokuta	3
		Kangulabentapur	Bantala		2
		Nuamouza	Balasinga		2
			Baluakata		1
			Sankhapur		1
	Sub Total	5	7	3	15

Gram Panchayats Tagged to Urban Local Bodies for Faecal Sludge and Septage Management (FSSM) in Angul District					
Sl. No	Name of Block	Grouping of GPs Falling under 10/15/20 Km Distance from the Urban Local Bodies			
		0-10 Km. Category- "A"	10-15 Km. Category- "B"	15-20 Km. Category- "C"	Total (A+B+C)
2	**BANARPAL**	**Jarasinga**	**Kukudanga**	**Garhsantri**	**3**
		Kandasar	Sankerjang	Gotmara	3
		Karadagadia	Tubey	Nuahata	3
		Kulad	Balaram Prasad	Talmula	3
		Kumanda	Phulapada	Tulasipal	3
		Kurudol	Giranga	Badakerjang	3
		Sakasinga	Banarpal	Bauligarh	3
		Bonda	Santarpur Kha	Benagadia	3
		Jamunali		Talmula Sasan	2
		Turanga			1
		Ranigoda Jungle			1
	Sub-Total	11	8	9	28
3	**CHHENDIPADA**	**Paranga**	**Natada**		**2**
			Nisa		1
	Sub Total	1	2	0	3
4	**TALCHER**		**Kunmunda**		**1**
			Gopal Prasad		1
	Sub Total	0	2	0	2
Total		**17**	**19**	**12**	**48**
II	Name of Urban Local Body		Talcher Municipality		
1	TALCHER	Bantol	Badajorada	Gurujanguli	3
		Dera	Dharampur	Santhapada	3
		Ghantapada	Gobara	Danara	3

Gram Panchayats Tagged to Urban Local Bodies for Faecal Sludge and Septage Management (FSSM) in Angul District					
Sl. No	Name of Block	Grouping of GPs Falling under 10/15/20 Km Distance from the Urban Local Bodies			
		0-10 Km. Category- "A"	10-15 Km. Category- "B"	15-20 Km. Category- "C"	Total (A+B+C)
		Kandhala	Jaganathpur	Gurujang	3
		Kankili	Brajanathpur		2
		Tentoloi	Karnapur		2

	Sub Total	6	6	4	16
2	BANARPAL	Budhapanka			1
		Bhogabereni			1
	Sub Total	2	0	0	2
3	KANIHA			Samal	1
				Hariharpur	1
	Sub Total	0	0	2	2
Total		8	6	6	20
III	Name of Urban Local Body		Athamallik NAC		
1	ATHAMALLIK	Nagan	Aida	Lunahandi	3
		Purunamantri	Luhasinga	Madhapur	3
		Kudagan		Kampala	2
				Thakurgarh	1
	Sub-Total	3	2	4	9
Total	3	2	4	9	
Grand Total	28	27	22	77	

FIGURE 10: Toilet-type distribution for the identified plug-in Gram Panchayats in the district using the data from SBM (Gramin) IMIS database



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The Water and Sanitation programme at the Centre for Policy Research (CPR) is a multi-disciplinary research, outreach and policy support initiative. The programme seeks to improve the understanding of the reasons for poor sanitation, and to examine how these might be related to technology and service delivery models, institutions, governance and financial issues, and socio economic dimensions. Based on research findings, it seeks to support national, state and city authorities to develop policies and programmes for intervention with the goal of increasing access to inclusive, safe and sustainable sanitation.

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