**SECTOR WISE SLIP Template: STORM WATER DRAINAGE**

1. **Assess the Service Level Gap**

The first step is to assess the existing situation and service levels gaps for Storm Water Drainage (AMRUT Guidelines; para 3 & 6). This will also include existing institutional framework for the sector. AMRUT is focused on improvement in service levels.The zone wise data shall be used in identifying the gaps. These zone-wise gaps will be added to arrive at city level service gaps. While assessing service level gap reply following questions not more than word indicated against each question.

* What kind of baseline information is available for storm water drainage system of the city? Detail out the data, information, plans, reports etc related to sector. Is zone wise information available? (75 words)

Ans:-City has kacha, pacca, open and closed drains for storm water drainage which is not sufficient. Most of the waste water drains out from the kacha drainages into the Keloriver.

* Have you collected data from census other sources? Are you aware of baseline survey data of MoUD? Have you correlated data from these and other sources? (75 words)

Ans:-Yes we have collected data from census 2011 and slum level. Yes we are aware of baseline survey data of MoUD. We have correlated data from these and physical survey by Corporation. As per census the total length of drain in the city is 257.21km but according to the survey by Corporation it has come 512.80km.

* What is existing service levels for storm water drainage in the city? What is the coverage of drains? What are the no ofincidence of sewerage mixing in the drains? How many times water logging incidence happens in the city?Provide comparative information of service levels (in tabulated form) with respect to the service level bench marks prescribed by MoUD and sustainable standards for service levels under the National Mission on Sustainable Habitat (NMSH) in table 1.1

Ans:-At present, the total length of drains is 49% of the length of roads. In rainy season due to heavy or constant rainfall water gets logged for 6 to 10 hours in some areas.

Table 1.1 Status of Storm Water Level service levels

| Sr. No. | Indicators | Sustainable standards | Black (Caution for improvement) | Red  (Immediate action for improvement) | Present Status |
| --- | --- | --- | --- | --- | --- |
|  | Coverage of Storm water drainage network | 100% | <75% | <50% | 49% |
|  | Incidence of sewerage mixing in the drains[[1]](#footnote-2) | 0% | <25% | <50% | 22% |
|  | Incidence of water logging[[2]](#footnote-3) | 0% | <25% | <50% | 25% |

* What is the gap in these service levels with regard to benchmarks prescribed by MoUD and sustainable standards for service levels under the National Mission on Sustainable Habitat (NMSH)?(75 words)

Ans:-In rainy season due to heavy or constant rainfall, water gets logged for about 6-10 hours in some areas. This includes some slum colonies which located besides nallah.

* What are major challenge facing the city in regard to achieving these service level benchmarks?

Ans:-Every year water gets logged in slum areas due to their location besidesdrainage/nallah. Because of these every year affected families stay in dharamshalaand other areas. For water drainage motor pump is installed. Due to this there is wastage of time and man power.

* Identify gaps in capacity in managing the services efficiently and also provide an innovative solution for efficiently managing these services.

Ans:-It is important to convert kucca drains to pucca drains or build underground sewerage for proper drainage of household and storm water.

* Brief the ongoing drainage projects in the city. The components included in these projects, how and up to what extent it will support to the drainage system of the city. Weather it address all the issues related to drainage?

Ans:-Construction of drains in city's main roads or sewerage line can solve the problem of logging and dirt will be reduced.

Coverage of drains

Please provide information in 150 words on the above responding to (however not limited to) following questions.

* Describe how at present, the storm water of City is drained off? How many natural and manmade drains are exists and their coverage with respect to road network?

Ans:-In city in nigam area storm water flows from small drains through nallah to river. When heavy rains, small drains gets flooded and overflows in streets.

* What is the capacity and condition of these drains? Is sufficient to carry the peak flow of the catchment/water shed?

Ans:- At present, the city has various small drains having less capacity due to which water loggs and storm water flows out from drains to roads.

* Does city have separate storm water drainage network? If no, provide the information regarding locations of gray water mixes with the existing drains in table 1.2. In case of mixed drainage how it works in peak rainy days?

Ans:-There is no separate storm water drainage network. All households drains and septic tank's overflow is draining in drains. In heavy rains storm water and drainage water flows on roads through nallah or directly mixesinto Keloriver through drains.

Table 1: Detail of Locations where storm water get mixed with sewer

|  |  |  |  |
| --- | --- | --- | --- |
| **S.No.** | **Location** | **Merging with which sewer** | **Reason** |
|  | Dhangardipa, Rambhata, Jagatpur, Dindayal Colony, Indira Nagar, Riyapara, Madhubanpara, Ramgudipara, Jogidipa, Ganja Chowk, Baikunthpur, Daroga para, Bid para, Beladula, Kaserpara, Banglapara, Panjriplant, Jailpara, Railway banglapara, Vikashnagar | Wasted water of septic tank's overflow mixes with open drains | Due to releasing septic tank's overflow water mixes with open drains |

* In case of mixed drainage how it works in peak rainy days?

Ans:-There is a need to construct large drains and nallahs to release drain and storm water.

Water Logging

Please provide information in 150 words on the above responding to (however not limited to) following questions.

* Presently how the problem of water logging is handled? Is it provides the satisfactory outcome?

Ans:-In case of water logging encroachment and bloackagesetc are eliminated through JCB or other mediums and many areas have water drainage through motor pump. This process takes about 3-6 hours to drain water but public is always unsatisfied.

* Provide details of flood points/areas prone to frequent water logging with special focus on Key road intersections, along roads (50 mt length or more) and Locality (affecting 50 HH or more) in the Table 1.2.

Table 1.2: Flood prone points in the city

|  |  |  |  |
| --- | --- | --- | --- |
| **S.No.** | **Area** | **No of points** | **No of times water logging reported in a year ( stagnant water for more than four hours of a depth more than 6” )** |
| 1 | Key road intersection | Siddhi Vinayak Colony, Indira nagar, Rambhata, Station road, Shyamtalkiz road, Railway under bride, Maaldhakkaroad | 3 to 4 times |
| 2 | Along roads ( 50 mt length or more) | Gopitalkiz road, Itwari bazar, Sanjay Complex | 3 to 4 times |
| 3 | Locality (affecting 50 HH or more) | Baijnathmodinagar, Chiranjivi das nagar, Gujratipara, Girls Collage | 3 to 4 times |

Chocking of drains

Please provide information in 150 words on the above responding to (however not limited to) following questions.

* Are drainsprone to chocking due to dumping of solid wastes in them? If yes,Provide details of locations prone to chocking of drains due to solid waste in the Table 1.2

Table 1.2: Detail of Locations prone to chocking of drains due to solid waste

|  |  |  |  |
| --- | --- | --- | --- |
| S.No. | Location | Stretch Length Affected | Reason |
|  | Dhangardipa, Rambhata, Jagatpur, Dindayal Colony, Indira Nagar, Riyapara, Madhubanpara, Ramgudipara, Jogidipa, Ganja Chowk, Baikunthpur, Daroga para, Bid para, Beladula, Kaserpara, Banglapara, Panjri plant, Jailpara, Railway bangla para, Vikashnagarr | 12 k.m. | House owners throw the house wastages to drainage due to which drainage gets jammed. Apart from this by throwing fruits and vegetables skin in drainage, drainage gets jammed. |

* How presently the problem is addressed?

Ans:-The problem is addressed by regularly cleaning drainages. Besides this public is also made aware through proclaim.

Institutional Framework

Please provide information in 150 words on the above responding to (however not limited to) following questions.

* Define role and responsibilities in terms of O&M, policy planning, funding, service provision in table 1.3. Is it in accordance with the AMRUT guidelines (Clause 8.1)?

Table 1.3: Functions, roles, and responsibilities

|  |  |  |
| --- | --- | --- |
| Planning and Design | Construction/ Implementation | O&M |
| Municipal corporation raigarh through consultant | Municipal corporation raigarh | Municipal corporation raigarh |

* How city is planning to execute projects?

Ans :-At present, nigam will survey for creating a plan to upgrade city's storm water and sanitary network. Under this city is divided in 5 zones. For this drainages/nallahas are integrated and separate plan of each zone is prepared. According to the plan construction of almost 254807 m length drainages/nallahas is proposed. Cost of this is about 100.00 crore. The proposal is to begin this work according to zones.

* Shall the implementation of project be done by Municipal Corporation? If no, weather resolution has been passed by the Municipal Corporation and accordingly, a tripartite Memorandum of Understanding (MoU) between State Government, Municipal Corporation and Parastatal has been signed?Please refer para 8.1 of AMRUT guidelines.

Ans:-Yes. AMRUT project by nagarnigam will be implemented according to the guidelines.

1. **Bridge the Gap**

Once the gap between the existing Service Levels is computed, based on initiatives undertaken in different ongoing programs and projects, objectives will be developed to bridge the gaps to achieve universal coverage. (AMRUT Guidelines; para 6.2 & 6.3, Annexure-2; Table 2.1). Each of the identified objectives will be evolved from the outcome of assessment and meeting the opportunity to bridge the gap.

* List out initiatives undertaken in different ongoing programs and projects to address these gaps. For this provide details of ongoing projects being carried out for sector under different schemes with status and when the existing projects are scheduled to be completed? Provide information in Table 1.4

Table 1.4: Status of Ongoing/ Sanctioned

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S.**  **No.** | **Name of Project** | **Scheme Name** | **Cost** | **Month of Completion** | **Status**  **(as on 15.08.2015)** |
| 1 | Drainage construction from circuit house to Urdana | 13thFinance | 154.10 lacs | Feb. 2016 | 30% complete |
| 2 | RCC drainage construction near panjari plant to culvert ward no. 29 | 13th Finance | 168.35 lacs | Dec. 2015 | 90% complete |

* How much the existing system will able to address the existing gap in storm water drainage system?Will completion of above improve the coverage of network; eliminate the chocking of drains and water stagnation problem? If yes, how much. (100 words)

Ans:-Water logging problem due to heavy rainfall in panjari plant area in road and populated area will be over by constructing nallah. For this purpose nallah is constructed according to the 13­thfinancial plan.

Circuit house to Urdana area has hilly area to the right side of road. In rainy season water from hilly area flows over roads to the left side populated areas and loggs. Due to this from Circuit house to Urdanaalmost 3 km long road gets damaged with erosion in many areas. From Circuit house to Urdana construction of drainage in the right side hilly area, storm water will not flow through road but through drainages on that way. Due to which populated area and road will be safe. From which coverage area of drainage will be incremented but there will be progress in drainage jam situation. Only water logging will be stopped in that area by construction of drainage/nallah.

* Does the city require additional infrastructure to improve the services? What kind of services will be required to fulfill the gap?

Ans:-Through construction of drainage/nallah.

* How does the city visualizeto take the challenge to rejuvenate the projects by changing their orientation, away from expensive asset replacement programs, to focusing on optimum use of existing assets?
* Has city conducted assessment of O&M cost of drains and potable pumps? if yes, what is it? Is city planning to reduce it?

Ans:-No separate survey/estimation/calculation is done for this purpose.

* Based on assessment of existing infrastructure and ongoing / sanctioned projects, calculate existing gaps and estimated demand by 2021 for Rejuvenation of existing drains, construction of new primary and secondary drains, construction of pump house with pumping machinery, covering of drains. Gaps in Storm water drainage service levels are provided as per Table 1.5.

Table 1.5 . Demand Gap Assessment for Storm Water Drainage Sector

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Component | 2015 | | | 2021 | |
| **Present** | **Ongoing projects** | **Total** | **Demand** | **Gap** |
| Major Drains | 257.21 km | 3.65 km | 260.86 km | 512.80 | 251.94 |
| Network requirement to provide proper drainage to all identified water stagnant point/ flooding points up to the end discharge point (in Km) | 254.807 km | - | - | - | - |
| Network length where households discharging wastewater directly into the drains | 26.20  km |  |  |  |  |
| Rejuvenation of existing primary nallahs and primary drains including covering and installation of filter |  |  |  |  |  |

* Whether these gaps presented in measurable/ execution able ways considering all the ongoing projects? (75 words)

Ans:-Yes survey has been conducted for this purpose.

Objectives

Based on above, objectives will be developed to bridge the gaps to achieve universal coverage. While developing objectives following question shall be responded so as to arrive at appropriate objective.

* Does each identified objectives will be evolved from the outcome of assessment?

Ans:-yes

* Does each objective meet the opportunity to bridge the gap?

Ans:-yes

* Doesobjectives clearly address all these gaps /solution to all the problems related to storm water drainage of the city?

Ans:-yes

Please provide List out objectives to meet the gap in not more than 150 words.

1. **Examine Alternatives and Estimate Cost**

The objective will lead to explore and examine viable alternatives options available to address these gaps.These will include out of box approaches. (AMRUTGuidelines; Para 6.4 & 6.8 & 6.9).This will also include review of smart solutions. The cost estimate with broad source of funding will be explored for each. While identifying the possible activities, also examine the ongoing scheme and its solutions including status of completion, coverage and improvement in O&M. Please provide information on the above responding to (however not limited to) following questions.

* Does all these gaps clearly identified and addressed? (75 words)

Ans:-yes

* What are the possible activities and source of funding for meeting out the objectives? (75 words)

Ans:-By creating awareness in public.

* How can the activities be converged with other programme like JICA/ ADB funded/SBM/Smart city mission projects in the city etc.? (i.e. convergence with other schemes)(100 words)
* What are the options (financial alternatives) of completing the ongoing activities specially on going JnNURM projects? (75 words)
* What are the lessons learnt during implementation of similar projects? (100 words)

Ans:-Normally disturbance is created during construction of drainage/nallah by people who declare their own land or possession and political pressure is imposed. Due to interference in work construction agency can not start their work again in that area. Therefore 10 days before construction of drainage and nallah, that area should be marked so that if somebody has any problem they can solve it before the work starts.

* Have you analyzed best practices and innovative solutions in sector? Is any of the practice be replicated in the city?(75 words)

Ans:-Before Drainage/nallah construction project after consulting people of that area local people should be involved during work.

* What measures may be adopted to recover the O&M costs?(100 words)

Ans:-Every house owner should be asked to pay for the drainage constructed in front of the house. With this they should submit money for cleaning drainage situated in front of the house according to the length of drainage. The result will be, house owner will not damage drainage in front of the house and will not throw household wastages.

* Whether reduction in O&M cost by energy efficient pumps etc be applied?(75 words)

Ans:-No

* Are different options of PPP such as Design-build-Operate-Transfer (DBOT), Design Built Finance Operate and Transfer (DBFOT) are considered?(100 words)

Ans:-No

The alternative activities to meet these activities be defined as per Table 1.6

Ans:-No

Table1.6 Alternative Activities To Meet Objectives

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr.**  **No.** | **Objective** | **Activities** | **Financing**  **Source** |
|  |  |  |  |

1. **Citizen Engagement**

ULBs will organize and conduct city level citizen consultation and receive feedback on the suggested alternatives and innovations. Each alternative will be discussed with citizens and activities to be taken up will be prioritized to meet the service level gaps. ULB will prioritize these activities and their scaling up based on the available resources. (AMRUT Guidelines; Para 6.6, 6.7 & 7.2). Please explain following questions in not more than 200 words detailing out the needs, aspirations and wishes of the local people.

* Has all stakeholders involved in the consultation?

Ans:-Through primary, secondary and others.

* Has ward/ zone level consultations held in the city?

Ans:-Yes

* Has alternative proposed above are crowd sourced?

Ans:-No

* What is feedback on the suggested alternatives and innovations?

Ans:-Praiseworthy and acceptable.

* Is any new potential alternative is received? If so, how it is addressed?

Ans:-no

* Has alternative taken up for discussions are prioritized on the basis of consultations?

Ans:-Yes

* What methodology adopted for prioritizing the alternatives?

Ans:-Scoring, ranking and open voting.

1. **Prioritize Projects**

Based on the citizen engagement, ULB will prioritize these activities and their scaling up based on the available resources to meet the respective objectives. While prioritizing projects, please reply following questions in not more than 200 words.

* What are sources of funds?

Ans:-JNNURAM

* Has projects been converged with other program and schemes?

Ans:-no

* Has projects been prioritized based on “more with less” approach?

Ans:-Yes but new wards have not been added.

* Has the universal coverage approach indiated in AMRUT guidelines followed for prioritization of activities?

Ans:-Yes

1. **Conditionalities**

Describe in not more than 300 wordstheConditionalities of each project in terms of availability of land, environmental obligation and clearances, required NOC, financial commitment, approval and permission needed to implement the project.

Ans:-For releasing city's storm water and upgrading sanitary network work, sufficient land is available. For this purpose there is no objection in taking environment acceptance. No objection for project related important non objection certificate, financial agreement, evaluation, approval etc.

1. **Resilience**

Required approvals will be sought from ULBs and competent authority and resilience factor would be built in to ensure environmentally sustainable storm water drainagescheme.Describe in not more than 300 words regarding resilience built in the proposals.

Ans:-In city's storm water and sanitary network upgradation project, sewarage treatment plant will be placed at the river shoreon two three places. Drainage water of city will be integrated into river after cleaning in treatment plant. This will reduce environmental pollution. Organisms and creatures in river and green areas near river will be increased. In this way, ecological balance can be maintained in green habitat. Underground water will be recharged and water level will increase.

1. **Financial Plan**

Once the activities are finalized and prioritized after consultations, investments both in terms of capital cost and O&M cost has to be estimated. (AMRUT Guidelines; para 6.5) Based on the investment requirements, different sources of finance have to be identified. Financial Plan for the complete life cycle of the prioritized development will be prepared. (AMRUTGuidelines; para 4, 6.6, 6.12, 6.13 & 6.14). The financial plan will include percentage share of different stakeholders (Centre, State and City) including financial convergence with various ongoing projects. While preparing finance plan please reply following questions in not more than 250 words

* How the proposed finance plan is structured for transforming and creating infrastructure projects?

Ans:-Will be taken under AMRUT mission.

* List of individual projects which are being financed by various stakeholders?

Ans:-Not available

* Has financial plan prepared for identified projects based on financial convergence and consultation with funding partners?

Ans:-No

* Is the proposed financial structure is sustainable? If so then whether project has been categorized based on financial considerations?

Ans:-No

* Have the financial assumptions been listed out?

Ans:-Yes

* Does financial plan for the complete life cycle of the prioritized development?

Ans:-No

* Does financial plan include percentage share of different stakeholders (Centre, State, ULBs and)

Ans:-No

* Does it include financial convergence with various ongoing projects?

Ans:-No

* Does it provide year-wise milestones and outcomes?

Ans:-No

Details in financial plan shall be provided as per Table 1.7,1.8,1.9,1.10 and 1.11. These tables are based on AMRUT guidelines tables 2.1, 2.2,2.3.1,2.3.2, and 2.5.

Table 1.7 MasterPlan ofStorm Water Drainage Projects for Mission period

(As per Table 2.1of AMRUT guidelines)

(Amountin Rs. Cr)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sr.  No. | Project Name | Prioritynumber | Year inwhichto beimplemented | Year in which proposed to be completed | Estimated  Cost  (in Rs. crore) |
| 1 | Integrated Storm & Sanitarynetwork, upgadation of existing drain network.  Zone - 01 | 2 | 2017 | 2019 | 22.87 |
| 2 | Integrated Storm & Sanitary network, upgadation of existing drain network.  Zone -02 | 1 | 2016 | 2018 | 15.22 |
| 3 | Integrated Storm & Sanitary network, upgadation of existing drain network.  Zone -03 | 1 | 2016 | 2018 | 24.11 |
| 4 | Integrated Storm & Sanitary network upgadation of existing drain network.  Zone -04 | 3 | 2018 | 2020 | 18.10 |
| 5 | Integrated Storm & Sanitary network, upgadation of existing drain network.  Zone -05 | 4 | 2019 | 2020 | 13.50 |
|  |  |  |  |  | 93.80 |
| At 7% for anticipated tender percentage = | | | | | 6.56 |
| Grand Total = | | | | | 100.36 |

Table 1.8 Master Service Levels Improvements during Mission Period

(As per Table 2.2 of AMRUT guidelines) (Amountin Rs. Cr)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Project Name | Physical  Components | Change in Service Levels | | | Estimated  Cost  (in Rs. crore) |
| Sr.  No. | Indicator | Existing  (As-Is) | After  (To-be) |
| 1 | Integrated Storm & Sanitary network, upgadation of existing drain network.  Zone - 01 | 60907.33 meter | 100% | 40% | 60% | 22.87 |
| 2 | Integrated Storm & Sanitary network, upgadation of existing drain network.  Zone -02 | 62197.71 meter | 100% | 60% | 70% | 15.22 |
| 3 | Integrated Storm & Sanitary network, upgadation of existing drain network.  Zone -03 | 47580.70 meter | 100% | 70% | 80% | 24.11 |
| 4 | Integrated Storm & Sanitary network, upgadation of existing drain network.  Zone -04 | 48193.19 meter | 100% | 80% | 90% | 18.10 |
| 5 | Integrated Storm & Sanitary network, upgadation of existing drain network.  Zone -05 | 35928.40 meter | 100% | 90% | 100% | 13.50 |
|  |  |  |  |  |  | 93.80 |
| At 7% for anticipated tender percentage = | | | | | | 6.56 |
| Grand Total = | | | | | | 100.36 |

Table1.9 Annual FundSharing Pattern forStorm WaterProjects

(As per Table 2.3.1of AMRUT guidelines)

(Amountin Rs. Cr)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Sr.  No. | Name of Project | Total Project  Cost | Share | | | | |
| GOI | State | ULB | Others | Total |
| 1 | Integrated Storm & Sanitary network, upgadation of existing drain network. | 100.36 | 50% | 50% | - | - | 100% |

Table 1.10 Annual Fund Sharing Break-up for Storm Water DrainageProjects

(As per Table 2.3.2 of AMRUT Guidelines)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sr.  No. | Project | GoI | State | | | ULB | | | Convergence | Others | Total |
| 14th  FC | Others | Total | 14th  FC | Others | Total |
| 1 | Integrated Storm & Sanitary network, upgadation of existing drain network. | 50.18 | - | 50.18 | 50.18 | - | - | - | - | - | 100.36 |

(Amountin Rs.Cr)

Table 1.11Year wise Plan for Service Levels Improvements

(As per Table 2.5 of AMRUT guidelines)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Proposed  Projects | Project  Cost | Indicator | Baseline | AnnualTargets  (Incrementfrom theBaselineValue) | | | | | | |
| FY2016 | | FY  2017 | | FY  2018 | FY  2019 | FY  2020 |
| H1 | H2 |
| Storm Water Drainage | | | | | | | | | | |
|  | 100.36 | 40% | 100% | 50% | 60% | 70% | 80% | | 90% | 100% |

1. Incidence of sewerage mixing in the drains are ratio of no of households discharging wastewater directly into the drains to the total no of households. [↑](#footnote-ref-2)
2. No of times water logging is reported in a year, at flood prone points in the city [↑](#footnote-ref-3)