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Revitalising Ponds for Climate Adaptation

Community-led Strategies: Managing Loktak Wetlands

Resilient Neighbourhoods through Water-Sensitive Urban Design: Bengaluru

Coastal Confluence Zone Planning: South Goa

SHGs in MSW Management: Udupi

Leveraging ICCC for Monitoring and Action

Empowering Urban Poor through Digital Learning: Odisha

Strengthening Municipal Finance: Peri-Urban Development

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# Digital Learning Platform for Empowering Urban Poor through Slum Dwellers Association (SDA) Capacity Building Programme in Odisha

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**BANISWETA PATRO**

*Content Developer & Trainer, Janaagraha*

**SIVARAM KANDASWAMY PAZHANIVELAN**

*Senior Manager, Civic Participation, Janaagraha*

**KUSHAL MP**

*Associate Software Developer, Janaagraha*

## Abstract

Digital technological practice under the Jaga Mission of Odisha supports its programme to ensure quality while reaching the scale of operations within desired timelines.

This study focuses on how the government of Odisha empowers the Slum Dwellers Association/s (SDA) as the 4th tier of governance. Janaagraha, the Knowledge and Technical Partner for the government's Housing and Urban Development Department, focuses on the Jaga Mission's slum upgradation and delisting resulting in the Adarsh Colony and the SDA's capacity building initiatives. This paper explains how the SDA training app and capacity building web dashboard are two major monitoring tools for conducting building training programmes across the state within a short time span. It highlights the functionality of the Adarsh Colony web portal which enables a data repository of the slum upgradation programme. The study also highlights the sustainability of the application as a user-friendly, scalable digital model through participatory urban digital transformation practices under the Jaga Mission for sustainable urban development

**Keywords:** Participatory governance, Jaga Mission, Slum Dwellers Association (SDA), Adarsh Colony, Jaga SDA Training App, Capacity Building Dashboard

## Introduction

Jaga Mission is the world's largest slum land titling and slum upgradation programme under the Housing and Urban Development Department, Government of Odisha. This mission has its roots in a landmark legislation—the Odisha Land Rights to Slum Dwellers Act 2017—undertaken by the Odisha government in August 2017. The Jaga Mission programme was started effectively in 2018. The land rights certificates and in situ slum upgradation programme is commonly known as Adarsh Colony for improving quality of life in the slums. The transforming of slums into the Adarsh Colony was accomplished by providing nine basic infrastructural works which included: In-house water supply, Individual household toilets, In-house electricity, paver road, streetlight, storm water drainage, parichay gruhas (community centres), child play equipment, and open space development.

To strengthen the bottom-up level of effective governance system, Slum Dwellers Associations (SDAs) are being empowered to be the fourth tier of governance following the central government at the country level, state government at the state level, and Urban Local Bodies (ULB) at the city level. The state of Odisha is empowering slum dwellers associations by providing roles and responsibilities for community engagement in the development of their slums. The SDAs formed within the slum level ensure transparency, accountability and decision-making by the slum dwellers. They play a major role in infrastructure development and community participation. SDAs in urban areas act as the bridge between the slum dwellers and the ULBs including municipalities, Notified Area Councils (NACs), and municipal corporations. The transformation of slums as Adarsh Colony and capacity building training programme for SDAs emerge as important examples for addressing a better quality of life. The need of the hour is to nurture this model for long-term sustainability in the modern digital era. Many citizens are used to digital technologies but in the slum areas, digital literacy rate is seen as comparatively low. Capacity building training programmes for SDAs are interventions that aim to empower the SDA leaders in various aspects that would aid towards becoming the fourth tier of governance.

The first round of trainings focused on SDA management and asset maintenance. The data was captured digitally through trainers providing the Jaga SDA Training App during the full-fledged roll-out training programme. The knowledge products include an SDA Training Manual for trainers and SDA workbook for SDA participants, video modules that can be shared among ULB officials and SDA leaders for the actual implementation and practice of the Jaga Mission components at the ground level. The existing Adarsh Colony portal (<http://bijuadarshcolony.jagamission.in/>) specifies a capacity building dashboard to make citizens aware and up to date on the programme. This continuous leveraging of technological inclusivity ensures the efficiency and accessibility of inhabitants towards achieving sustainable urban development.

In Odisha, approximately 70 lakh households live in cities and towns. Out of the total urban population, 17 lakh (24%) live in, i.e. 1/4th of the urban population (Department of School & Mass Education, 2011) (Patnaik, 2022). There are a total of 2919 SDAs for the slums in 115 ULBs across Odisha. Of these, More than 1600 slums from Odisha are upgraded, delisted, and transformed into Adarsh Colony as of April 2024 under the Jaga Mission programme (Jaga Mission, n.d.). The process of delisting of slums of Adarsh Colony consists of identification and



listing, PNA (participatory needs assessment), preparation of infrastructure gap (I-Gap) to assess the infrastructural gap at the slum level, execution of slum upgradation of projects, completion of slum upgradation project, delisting proposal submitted by SDA to the ULB, delisting procedure, and lastly, the renaming of the habitation and change of records. The executive officers of ULBs are responsible for the success of the programme. The participation of ULB engineers, community organisers and ward officers helps to complete the process. The ULB then through the ward officer incorporates the necessary corrections and changes and other records that publicise the change in the name of slum which is then upgraded, delisted and transformed into Adarsh Colony/Residential Welfare Association as per standard operating procedure (SOP) of Jaga Mission (<https://bijuadarshcolony.jagamission.in/about>). The entire process of slum upgradation follows the participatory approach involving the community at every stage of the transformation. Slum dwellers associations are directly involved in the process. Their members have an Executive Committee selected from among themselves. There are ten executive members who comprise the President, Secretary and Treasurer as SDA leaders and others as executive members among them. It is mandated that at least 50 per cent of the EC members should be women as it is critical to have gender inclusiveness in the decision-making body. Slum dwellers are members of the General Body of the SDA.

The Janaagraha- Centre for Citizenship and Democracy, a non-profit organisation is one of the knowledge partners of the Housing and Urban Development Department, Odisha, for providing a better quality of life to the urban slum dwellers in the participatory governance process. Janaagraha works with citizens and governments to improve the quality of citizenship and quality of infrastructure and services in various states across the nation. The civic participation strand of Janaagraha works with the Jaga Mission majorly supporting the capacity building programme to empower the SDA and participatory slum upgradation programme. Hence improving the capacities of SDA appear as the high time priority to achieve the objectives of the programme. Janaagraha's expertise in digital learning platforms serves capacity-building design mechanisms. The Jaga SDA training app and capacity building dashboard are two major technological changes to be taken into account while monitoring the outcome of the SDA capacity building programmes. The SDA training app is a project management tool that has helped to track the massive scale of trainings (about 200) within a few months across all ULBS of the state. The app has been developed by Janaagraha and trainers to feed in the data which helps in taking informed decisions about the initiative that has trained more than 7500 SDA leaders. The Jaga SDA training mobile app is live on Google Playstore and a capacity building web dashboard interface as part of the Adarsh Colony portal. The Adarsh Colony portal is a user-friendly public open source for accountability to the citizens, government officials and urban slum dwellers. Also, different stages of the slum upgradation work and transformed slum numbers are available for the public to view to increase the transparency of the initiative. The paper aims to understand technology led intervention in implementing a state wide capacity building program for SDA Leaders on various themes within short span of time. This provides insight on the data led decision making in effectively conducting large scale capacity building programs. The paper outcome is based how digital applications led capacity building program take shape in urban slum areas in Odisha.

## Literature Review

An analysis of available literature reveals that low-income groups are most affected by the digital divide issues among the poor in different places in urban areas. Digital literacy has not taken any shape yet to support the modern digital era. The usage of smart phones in developmental works is still low. The urban poor have low engagement with digital information. So, the idea is to create platforms where the urban poor in slums can get digital literacy using a website, social media, applications etc. At the Urban Local Body level, government officials should extend support and assistance to the urban poor through digital literacy platforms (Mulyaningsih, 2021).

Another literature source reveals that the reimagining the technologies for urban poor in developing country like India, the Uni-Fi node in a city can be networked and managed centrally and easy-to-use drag and drop interface for transforming urban local body contents on engaged government led programs monitoring which can create milestone to achieve meaningful sustainable growth in the urban poor areas. There are multiple benefits can be observed from the Uni-Fi concept. The governance issues created in the neighborhood can be addressed in the given time period. Therefore, poor households can create a bond with government to develop a healthy and safe atmosphere in the community (Kesavan, 2015).

## Methodology

This paper discusses the results of digital learning platforms such as the Jaga SDA training app, capacity building dashboard, and Adarsh Colony portal where all the interventions of the slum upgradation component and SDA capacity building programmes are covered. Continuous practices on digital transformation at slum level can lead the path towards achieving sustainable digital transformation among slum dwellers for overall development of their areas. Literature study reveals that there is a demand for creating more platforms for improving digital literacy among the urban poor for overall development of their areas though digitalisation of information.

In the Jaga Mission Programme, the team has put forward the digital technological solutions for urban slum dwellers of Odisha for long term sustainability of the Adarsh Colony model in the urban slum areas. To strengthen this governance model, the capacity building training for the SDA is on ground level. The digital support provided by the Janaagraha tech team is evaluated by parameters including training information, operation and management, and user interference. The usage of the tech platforms for data captures the SDA training programmes across the state by trainers and ULB officials. They are trained by the state team for the smooth functioning of tech platform. Digital technological practices help to reduce the digital divide among urban slum dwellers and this platform can be a future reference for other SDA training programmes.

Table 1: Methodology for Digital Learning Platform Sustainability for Future Urban Digital Model

	Methodology	Results	Supplementary
<p>Digital Learning Platforms Empowering Through Sda Capacity Building Program</p> <p>Jaga Mission</p> <ul style="list-style-type: none"> <li>State Team – Jaga Mission</li> <li>Urban Local Body</li> <li>Slum Dwellers Association – SDA as 4<sup>th</sup> tier of Governance</li> </ul>	<p><b>Literature Review:</b></p> <p>How digital divide has been among urban poor in slum areas</p> <p><b>Outcome of Paper:</b></p> <p>Need of digital platforms where urban poor will be capacitated for overall development of their areas</p>	<p>Capacity Building Round 1 and Round 2</p> <p>Quality of the training program –</p> <p>SDA Training Manual, SDA workbook and documentary videos are sent to participants for executing the role and responsibility at the ground level</p> <p>Digital support to Capacity Building –</p> <p>Data capturing during training program by trainers with support from ULB officials</p> <p>– Jaga SDA training App, Capacity Building Dashboard web interface to Adarsh Colony Portal portal</p> <p>Data-Driven Governance</p>	<p>The digital technological practices adopted by the Jaga Mission Capacity Building program can be the future reference for other SDA training programs.</p>
	<p>Gathering Knowledge:</p> <p>Components of program- Adarsh Colony, Capacity Building program</p> <p>Objective of Capacity Building of SDA- Empowering SDA as 4<sup>th</sup> Tier of Governance through providing quality of life and digitally empowered by training program</p>	<p>Impact assessment of the usage of the tech digital platform by the state capacity building team and tech team</p> <p>Feedbacks are taken from the participants, all the necessary changes are made in the application such as the Jaga SDA training app for smooth conducting of the future data entries of the training program</p>	
	<p><b>Analysing &amp; Synthesizing Knowledge-</b></p> <p>Qualitative Analysis of both training program &amp; digital platforms provided for the slum dwellers for future reference trainings Janaagraha and data driven open source commitments</p>	<p>The comparative analysis of tech platforms is done by team on Information, process flow, operation and management and User interface</p>	

Source: Author

## Scope and Limitations

During the development of the tech platform, the civic participation-state team had the opportunity to explore the Adarsh Colony portal and its data repository. These open digital platforms, such as the capacity building dashboard and Adarsh Colony portal, serve this model for urban development practitioners and policymakers.

Though this application is built for open source and available in the Google play store, access is designed to be granted only to the state capacity building team and ULB and SDA trainers of the capacity building training programme. This platform is not accessed by the general public or other officials not engaged directly in this programme

## SDA Capacity Building Programme

The SDA capacity building Round One objective covers broadly two modules on SDA management and SDA asset maintenance where regular SDA monthly meetings, maintaining the resolution of registers, and managing SDA bank accounts are featured. Apart from that the slum asset listing, asset maintenance, and user fee collection from Adarsh Colony or slums are some of the important tasks of the SDAs. The target audience is the SDA President, Secretary, Treasurer, and other Executive Committee members. The programme takes place through a cascading approach where trainers are selected from each ULB based on selection criteria developed by the capacity building state team. The trainers are a combination of master trainers with previous training experience, selected by the ULB and members from the SDAs themselves. These trainers participate in the Training of Trainers (TOT) at the state level and then are expected to pass on the knowledge to the SDA leaders during the training programme roll-out. The Jaga SDA training app and capacity building dashboard emerged as the two major monitoring tools under the digital governance transformation system. Detailed information on training programmes, participants, management, process, structure, strategy, and technology are the seven critical factors addressed during digital technology management in the SDA capacity building programme which focuses on a participatory approach of the trainings where it also acts as a cross-learning platform among the leaders of various SDAs.

## *Achievement of Capacity Building Programme after Round One Roll-out*

The state capacity building team has experienced pre-pilot Training of Trainers (TOT), pilot TOT, cluster-level TOT, and roll-out of full-fledged training programmes for leaders of the SDAs. The state team selected seven geographic clusters for conducting the TOT programme across the state. All the official communication documents for the same are shared with the organising Urban Local Bodies. The trainers then capacitated the President, Secretary, and Treasurer of the SDAs in Round One roll-out training. The number of training programmes as per batch, as per distance is counted for the roll-out training plan.

The entire capacity-building programme has been enabled with digital technology developed by the Janaagraha tech team in the form of a mobile app that is the Jaga SDA training app and a web dashboard. The application acts as the programme management tool capturing each training batch's details comprising various data and photographs. Each training batch has details of the attending participants' names with basic details, trainer details, and session images.

In Round One, more than 7500 (85% of the 8757 people) participants from 2748 (96% of 2919) SDAs were capacitated by 428 trainers selected by the state capacity building team, Jaga Mission, in 193 training sessions across 111 Urban Local Bodies. Out of these, 52 per cent were women. All the training related data is captured in the Jaga SDA training app and is reflected live in the capacity building dashboard in the Adarsh Colony portal.

### ***Master Data and Real-time Data Analysis***

The entire process from pre-pilot to training roll-out programmes is captured and well documented. The date of training, place of training, total ULBs trained, total SDAs trained, total participants, total male, female, and transgender participation in the form of district range, ULB range, and date range constitute some of the information the state team has been working out along with photographs from each training batch. Real-time data analysis helps to make informed decisions.

For creating a template or framework for the capacity building dashboard, the tech team analysed the requirement details for the training programme with the support of the state capacity building team. The set-up raw data was analysed and determined, and the visuals and customised template prepared. Template options were shared with the team for approval. It provides interactive graphs and charts that highlight important performance indicators, well-organised assessment and analysis.

### ***Need for Jaga SDA Training App***

The training application is required in order to digitally collect all of the training data to monitor the full-fledged training programme. The Jaga SDA training app is a simple Android application to manage the SDA capacity building programme and assessment of data collected during training sessions. It is a user-friendly mobile application designed to facilitate efficient communication and collaboration among trainers of the state of Odisha. It enables trainers to manage training data captured during training programmes conducted by Urban Local Bodies.

### ***Development Phases of Jaga SDA Training App***

The tech team is associated with the state capacity building team during the pre-development, development, and post-development phases of the application. After getting permission from the Jaga Mission, Housing and Urban Development Department officials and the tech team worked out the requirement identification, application features, language translation, and so on. The operation and management of the application included planning, analysis, and tool management during the development phase. The state capacity building team demonstrated to the trainers the uses of the application in detail. Only a user who carries an Android phone can use the Jaga SDA training app. The trainers or ULB officials have put a lot of effort into completing the application process and with feedback received from the users, the application is developed for extensive use.

**Figure 1: Data Feeding on Jaga SDA Training App in English Language**

**Thank you!**  
You have successfully completed the training

**ଧନ୍ୟବାଦ !**  
ଆପଣ ସଫଳତାର ସହିତ ଏହି ତାଲିମକୁ ସମ୍ପୂର୍ଣ୍ଣ କରିଛନ୍ତି

**Training Details**  
Batch Code : 341-6034-L1-01  
District : Balangir • ULB : Kantabanji

Trainer 1 : Ghasiran Suna  
( District : Balangir • ULB : Kantabanji )  
Trainer 2 : Nunkaran Sahu  
( District : Balangir • ULB : Kantabanji )

Total SDA : 17  
Total Participants : 51  
( 35 Male • 16 Female • 0 Transgender )

11 December 2023 at 10:00 am  
Conference hall, Kantabanji

**ତାଲିମର ବିବରଣୀ**  
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ଜିଲ୍ଲା : Koraput • ପୌରସଭା : Jeypore

ତାଲିମଦାତା -୧ : Sujata Mali  
( ଜିଲ୍ଲା : Koraput • ପୌରସଭା : Jeypur )  
ତାଲିମଦାତା -୨ : Smritirani Jena  
( ଜିଲ୍ଲା : Koraput • ପୌରସଭା : Jeypur )

ସମ୍ପୂର୍ଣ୍ଣ ବସ୍ତୁ ବାସିନୀ ସଂଘ ସଂଖ୍ୟା : 13  
ସମ୍ପୂର୍ଣ୍ଣ ଅଂଶଗ୍ରହଣକାରୀଙ୍କ ସଂଖ୍ୟା : 37  
( 19 ମୋଟ ପୁରୁଷଙ୍କ ସଂଖ୍ୟା • 18 ମୋଟ ମହିଳାଙ୍କ ସଂଖ୍ୟା • 0 ଟ୍ରାନ୍ସଜେଣ୍ଡର )

**Close** **ବନ୍ଦ କରନ୍ତୁ**

Source: Trainers from SDA Kantabanji and Jeypore Urban Local Bodies of Odisha captured data through the Jaga SDA Training App in the month of December 2023

The training application is required in order to digitally collect all of the training data and three steps are followed for submitting the data on the Jaga SDA training app. Adding the trainer names such as Trainer 1 and Trainer 2, selecting the training date, venue, total number of participants and training level is to be filled up in Step 1. Adding participants by filling the details of participant's name, designation, gender, ward and its SDA along with participant's mobile number to record their presence at the training is required in Step 2 with relevant validations such as avoiding duplicate participant entry, adding up to three participants per SDA. Uploading training and group photos comprise Step 3 with relevant validations for mandatory training picture upload for specific photo types. A unique batch code is generated to represent the training submission data captured from Step 1 to Step 3. Every training post's successful submission is represented by a unique batch code generated at the backend. The data feeding is completed after the training programme. All the master trainers and ULB officials have been capacitated by the state team. The WhatsApp group has been created for the interaction and orientation of ULB officials and trainers for the usage of the Jaga SDA training app in the Training of Trainers (TOT) and roll-out training programme.

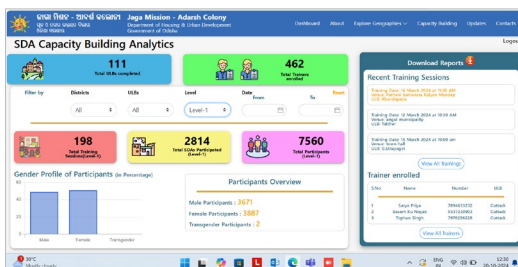
## Web Interface Capacity Building Dashboard in Adarsh Colony Portal

A web interface capacity building dashboard gives the overall analysis of state level data, district-wise data, ULB-wise data, and also as per customised date range.

Development Phases of Capacity Building Dashboard: The tech team is associated with the state capacity building team, Odisha, during the pre-development, development, and post-development phases of the application. The dashboard is built using JavaScript frameworks VUEJS, NodeJS and database as MongoDB: VUEJS for frontend development, NODEJS for backend development, and MangoDB for database preparation. The state capacity building team and tech team both are accountable for the functioning of the dashboard at the backend. All the technical and physical issues during the training programme are addressed in this system.

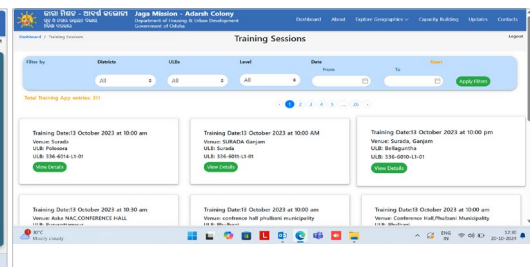
Data captured through the Jaga SDA training app is utilised in designing detailed reports and analysis in the capacity building dashboard. This makes it easy for Jaga Mission, H&UDD officials, and citizens to observe the progression of the work or status. It helps to modify the changes with different support systems; subsequently, data reflected in the dashboard is on almost real-time basis. Therefore all the training data, photographs, and participant's details are stored in the application and reflected in the Adarsh Colony portal, also known as the repository of the state team. The real-time data is displayed in the capacity building dashboard for the users' (state capacity building team) reference.

Figure 3: SDA Capacity Building Analysis – Frontend Framework



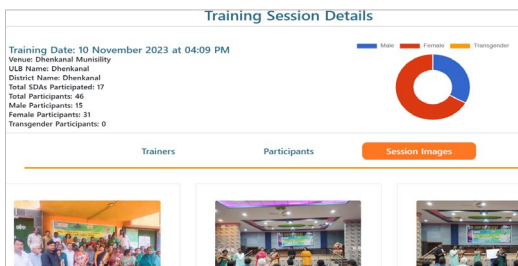
Source: Jaga Mission

Figure 4: Training Session Details from Different ULBs



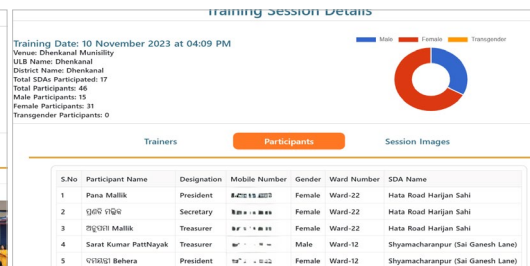
Source: Jaga Mission

Figure 5: Session Images, Participant Details, and Trainers of each Training Programme



Source: Jaga Mission

Figure 6: Training Data Range Shows District and ULB Information



Source: Jaga Mission

### ***Adarsh Colony Portal***

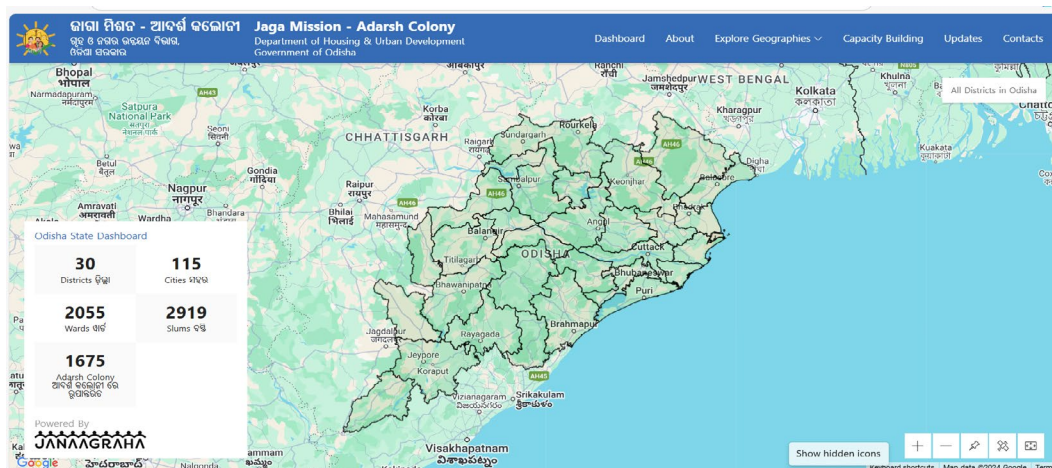
Janaagraha's tech team support for the preparation of the Adarsh Colony web-based portal along with a web interface dashboard in the Adarsh Colony portal adds a new feather to the technological advancement in the bottom-up approach governance system. The Chief Minister of Odisha launched the Adarsh Colony Portal (<http://adarshcolony.jagamission.in/>) for the public. The Adarsh Colony portal is a web portal in which all the citizens and the government are accountable for the slum upgradation component or delisting of slums. The portal also gives content on district-wise, city-wise, and ward-wise slum detail information and the web interface of the dashboard in the Adarsh Colony portal where the progression of works is reflected live to the citizens. The state dashboard for transforming slums into Adarsh Colony shows the overall achievement of delisting slums out of a total of 2919 from 115 ULBs in Odisha. The Adarsh Colony portal is being updated with information as of the date in the backend support by the tech team as well as the state team of Jaga Mission. Apart from that, all the approved documents including standard operating procedures, Jaga Mission documentary films, and documentation (including SDA training manual, SDA workbook) are uploaded periodically in the portal under users' control and customised for citizen's reference.

### ***The Adarsh Colony Portal as a Repository Data Mechanism***

All the slum information of the state and capacity building programme training sessions are being recorded in the Adarsh Colony portal. The ULBs have been digitally empowered to update the portal by the state team which is expected to hand over some of the functions of the Adarsh Colony portal for updating slum related information. The state team has arranged training sessions for 15 ULBs was organised end of 2023 in the pilot phase for providing basic functions and importance of technical platforms like Adarsh Colony portal which acts as data repository for Jaga Mission programme. The key participants were Urban Local body officials of Odisha. The step-wise uploading of information relates to slum data, photos of slum upgradation works, SDA training information, slum level events and so on. ULBs are trained to ensure that uploading is done on a decentralised basis. Positive feedback on user interference of the portal and queries from the ULB are addressed. The Adarsh Colony state team has been actively working on the delisting of slums and their transformation of slums into Adarsh Colony. The state team and tech team both give updates in the Adarsh Colony portal and the state PMU has been providing extensive training to the ULB officials in a phase-wise manner on the know-how, basic functioning, and the importance of technical platforms like the Adarsh Colony portal which acts as the repository of completion of works for the public. The handover of ownership taken up by ULBs in uploading all the information required shall be monitored by Janaagraha.



**Figure 7: Image of Adarsh Colony Portal which Displays All Information on Slum Upgradation or Transformation of Slums into BAC**



Source: Adarsh Colony Portal (<http://adarshcolony.jagamission.in/>). Data Updated Information (slum delisted) here up to as on 2024 2024)

## Urban Digital Model for Capacity Building Programme and BAC: A Comparative Approach

Digital technological advancement is now an integral part of slum transformation and empowering slum dwellers associations. Taking into account the adoption of technologies such as the Jaga SDA training app, capacity building dashboard, Adarsh Colony portal and dashboard has several positive implications for the broader digital governance context in which participation takes place. The combination of these technical developments in the third tier (ULB level) and fourth tier of governance results in digital governance, a new paradigm for government. The information, operation and management, user interface, and process flow are the parameters developed to compare the capacity building programme's digital technologies and the Adarsh Colony portal.

It also enhances the four modes of public participation, including knowledge transfer, collective decision-making, choice and voice, judgment and oversight.

**Knowledge transfer:** The approach for service delivery is based on interaction and orientation for digital technologies by the state capacity building team. The target audience gets digitally empowered through this process. The target audience is then recognised as government-empanelled trainers, opening opportunities for them as future trainers which helps them improve their livelihoods.

**Judgement and oversight:** The entire capacity building programme under Jaga Mission is enabled through digital technologies. The actual training data and application are analysed and channelised through the comparative remarks.

Table 1: Comparative Approach: Digital Technology Practices

Comparisons	Capacity Building Training Programme			Remarks
	Actual Data/Master Data	Application Data	Capacity Building Dashboard	Adarsh Colony Portal and Adarsh Colony Dashboard
Information	The state-wise, district-wise, ULB-wise training details including total participants, total male, total female, total transgender, and organising ULB names are captured and updated for state reference. Photographs of each and every training batch are captured.	The state team provides comprehensive information as a decision support system to the tech team for analysing data and updating applications. Jaga SDA Training App is the Android app built for capturing training programmes.	The tech team visualised the data (detailed reports and analysis) provided by the state team. The information displayed in the dashboard is real time and updates automatically.	Actual data versus application data is analysed to evaluate the technical efficiency of the training programme
Process Flow	Followed up with organising ULBs through official communication letters WhatsApp group is prepared for logistic support and training information gathering Training data updated in master data information including date- wise, ULB-wise, district wise, and shared with government officials	Frequent internal communication and meetings with the state team for preparing application steps. Every feature/screen is documented with relevant wireframe prototype screens, frozen with respect to release dates Three steps are made to capture training data successfully: Step 1 – Select Trainer 1 and Trainer 2, select the training date, venue, total number of participants and training level, Step 2 – Upload attendance sheets through capturing participant details such as name, designation, gender, ward and its SDA along with participant mobile number to record their presence at the training Step 3 – Upload training photos, group photos etc., with mandatory selection for specific photo types. The state team demonstrated the application usage to the master trainers and ULB officials. The preferred language for the data feeding is English and Odia.	Below are the steps to be followed to access the training programme Step 1 – The URL link is provided for access to the dashboard Step 2 – Credentials (email and password) are required to login Step 3 – Visual data is displayed for state and citizen encounters	The follow-up with organising ULBs and daily update information for the training programme is addressed in Round One of the SDA Capacity Building programme The Adarsh Colony portal emerges as the repository for the entire Adarsh Colony and Capacity Building programme The web interface capacity building dashboard is linked to the Adarsh Colony portal

Comparisons	Capacity Building Training Programme			Remarks
	Actual Data/Master Data	Application Data	Capacity Building Dashboard	
Operation and Management	<p>The training data is managed by the state capacity building team for analysis and total male, total female, and total transgender participation</p> <p>The effectiveness of training programmes are measured</p>	<p>ULB-wise login ID and password are shared with the master trainer and ULB officials for updating training data</p> <p>All the necessary ground-level issues including adding the trainer name, changing the slum name, venue name etc. are addressed by both the state capacity building team and tech team</p>	<p>The management of backend support to the dashboard is operated by both the tech team and the state team, Odisha</p>	<p>The effectiveness of the training programme is measured by the state team</p> <p>The Jaga SDA training zpp is user-friendly for the target audience and can be used for any capacity building programme for SDAs</p> <p>All the tech-related feedbacks are taken from the participants (trainers, ULB officials) for the smooth functioning of the Jaga SDA training app.</p> <p>Auto save system enhancement is prepared for smooth functional usage in application</p>
User Interface	<p>Master data is extensively used for the documentation and analysis of the training programme</p>	<p>The Jaga SDA training app is used by master trainers and ULB officials</p> <p>The state team and the tech team are available to provide backend assistance for the process</p>	<p>Only the state team and tech team can access the Login ID credentials for the training programme</p>	<p>One can't see the other ULB information by using the same Login ID and password</p> <p>ULB Login ID credentials are provided to ULB officials to empower them digitally through the participatory process</p>
			<p>The Adarsh Colony portal and Adarsh Colony dashboard are extensively used by the state and tech teams</p> <p>ULB officers from different ULBs are participants</p> <p>ULB-wise Login IDs are the same as capacity building</p>	<p>The tech team receives extensive support from state PMU to operate the portal</p> <p>All the changes or modifications for the slum name, ULB name, district name etc. are addressed</p> <p>The backend modifications are managed by both teams</p>

## Issues and Challenges during the Technological Development in Adarsh Colony and Capacity Building Programme

The records of a database include the indexes in the application data. The completeness, correctness, and clarity of data are measured through a comparative approach among digital technologies using Adarsh Colony and capacity building programmes.

**Data duplication:** A few instance of duplicate entries occurred during the extensive usage of the Jaga SDA training app. The data entry responsibility was given to trainers and SDAs for future references in the app. The monitoring of the entire data capturing process, apart from the documentation across the state was challenging during the short notice period of time. The state team segregates the correct data and duplicate data with support from the tech team. The combined decision-making (both state team, Jaga Mission and tech team) are taken for the effectiveness evaluation for bringing data accuracy in the Jaga SDA training app.

**Adarsh Colony portal updating:** Concerning the Adarsh Colony portal, the tech team works on the Adarsh Colony portal updating. The team also introduced the concept of unique Slum IDs where the data starts updating based on slum IDs, which avoids major errors.

**Managing data from different sources:** The state team organised a training session to show the target audience how to use the Jaga SDA training app, and occasionally technical glitches occurred when the application was used extensively throughout the training programme. The tech team fixed the issues and managed the process flow of the massive training programmes digitally.

**Challenges redressed of Jaga SDA training app:** Exchange of slum name/trainer contact details—these are the second most common issues seen during the programme. The state capacity building team and tech team manage this updated information of the participants once the capacity building dashboard Login ID credentials are shared by the tech team using backend support.

**During capacity building training programme:** It is observed that only those who have Android phones can be users of the Jaga SDA training app. On the other side, the users' feedback is taken into consideration for smoothly conducting training program. The outcome consists of the joint decision made by the tech team and state team Jaga Mission to solve the auto-save mechanism to function Jaga SDA Training App as user-friendly application. The challenge in feeding the forms in the application, sometime was the data didn't get AutoSaved that resulted for the trainer to redo data input entirely from start. Hence the stakeholders decided to introduce the auto save feature that helped in overcoming this challenge.

**Challenges redressed of capacity building dashboard functions:** The data ranges (including district-wise, ULB-wise and date-wise training programme are collected and developed with the increasing requirement of the state team and later it is enabled as the ideal data storage for any digital platform. To address this challenge, initial checkpoints were established during participant entry and batch code entry generation. These checkpoints were manually flagged during decision making by both the state team and tech team and corrected as a quick fix in the initial phase.

However, recognising the need for a more sustainable solution, enhancements were made to the app features to automate these checkpoints. This proactive approach reduced manual efforts and streamlined the process of identifying and rectifying data duplication over time.

The entire state and ULB readiness for organising the full-fledged SDA training programme helped the process to be successfully conducted at the slum level. The trainers (from slums) were selected for the ULB level and SDA level. The SDA roll-out training programme has gained recognition state wide as the master trainer and it will also support them for livelihood and strengthening the decision making power among urban slum dwellers of Odisha. That Janaagraha plays a major role at slum level for improving quality of life can be assessed through feedback taken by the participants from the SDA training programmes..

## Conclusion

SDA capacity building and education is an approach for citizen-centric work in the development sector. Knowledge transfer and collective decision-making evolve through digital participation in the SDA training programme under the Jaga Mission. The digital governance platforms have been key components of the Jaga Mission for facilitating information and empowering the target audience effectively. The comparative approach demonstrates the modes of digital participation in the capacity building programme and the Adarsh Colony portal. The master data and real-time data have been analysed for better performance of the training programme in the digital platform. The Jaga SDA training application can be enabled as a user-friendly application for future SDAs' capacity building programmes. It enables slum dwellers as future educators among themselves and develops their decision making and leadership power. The effectiveness of the technological usages during capacity building programmes are evaluated by the state and tech teams through completion of the Jaga SDA training application process. The Urban Local Bodies are there to support the trainers for completion of the application process. All the necessary training programme information required to feed in the Jaga SDA training app is given and this training data will reflect in the capacity building dashboard, a web interface in the Adarsh Colony portal. All the selected trainers and ULB officials are capacitated for the usage of the application by the state team. The issues that occurred during usage are addressed and incorporated in the app. The ULB-wise Login and Password are shared with the trainers and ULB officials for smooth execution of the process.

The impacts of the digital transformation practices change in the 3rd and 4th tier governance systems digitally empowered in the case of Odisha. The Urban Local Bodies and SDAs are capacitated to be able to use the respective digital applications such as Adarsh Colony Portal and Jaga SDA training app. The department and SDAs would be able to sustain and further improve the interventions as they are an active part of the interventions along with training programmes. This urban digital model can be featured as a future scalable digital model in the SDA capacity building trainings under the Jaga Mission programme. These technological platforms help to bridge the digital divide that exists in urban poor communities. The process outcomes bring urban slum dwellers digitally empowered through this digital intervention. Apart from this, trainers from SDAs can get better livelihood opportunities and could be future empanelled trainers for

other training programmes. Janaagraha plays an important role in the participatory governance process under the Jaga Mission's long term commitment for providing high priority roles and responsibility to the SDAs. To support the SDA capacity building team, the Janaagraha tech team has prepared a technological platform for the smooth coordination of the training programmes. The involvement of slum dwellers in the participatory digital governance process is evidence of the improved operational efficiency and innovativeness of participants that aligns with sustainable urban development of the society.

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### Conflict of Interest

The authors declare no conflict of interest.

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National Institute of Urban Affairs

## **National Institute of Urban Affairs**

1<sup>st</sup> Floor, Core 4B, India Habitat Centre, Lodhi Road, New Delhi - 110003, INDIA

Phone: (+91 11) 24634971/24643576

[www.niua.in](http://www.niua.in)