

Report on

**Amrita's Contributions to the Tsunami Readiness
Program in Alappad Community, Kollam, India (Phase
III)**

Submitted To



Kerala State Disaster Management Authority
Govt. of Kerala

Submitted By



Amrita School for Sustainable Futures and
Amrita Center for Wireless Networks and Application
AMRITA VISHWA VIDYAPEETHAM
Kollam, Kerala-690525

Executive Summary

Between September 2023 and February 2024, Amrita Vishwa Vidyapeetham, in collaboration with KSDMA and INCOIS, implemented Phase III of the Tsunami Readiness Program in Alappad Panchayat under the UNESCO–IOC Community Tsunami Ready (CTRI) framework. The program combined participatory hazard mapping, school- and community-based awareness, and governance integration to strengthen local preparedness. A core field exercise engaged 13 ward members and 25+ Amrita students/researchers in transect walks and A4-to-large-sheet community mapping, producing resource and evacuation maps that identified signage points, shelters, and warning nodes. During Tsunami Awareness Week (2–4 Nov 2023), activities across three schools reached 230+ students, complemented by a short Disaster Awareness Course for students, teachers, and community members, including orientation to government early-warning apps. Separate women-led and fishermen-led workshops captured gendered mobility constraints and occupational route knowledge, yielding three community-validated evacuation maps. Focus Group Discussions across nine coastal schools further assessed perceptions of early warning, evacuation, and safety culture.

The initiative revealed several enablers, including strong community participation, leadership by ward members, integration with school and panchayat systems, and the presence of active local women’s networks. Inhibitors included the lack of standardized evacuation signage, limited mock-drill routines, and physical constraints such as the bridge bottleneck and narrow access roads.

Moving forward, the report recommends: 1) Enhancing early-warning dissemination through redundancy and localization; 2) Annual multi-stakeholder mock drills emphasizing inclusive participation of women, elders, and children; 3) Strengthening shelter safety and WASH infrastructure, particularly gender-segregated facilities; and 4) Institutionalizing swimming and evacuation training in schools and women’s groups to improve community mobility during emergencies. Together, these enablers and targeted actions position Alappad as a model coastal Panchayat advancing toward full Tsunami Ready certification through collective participation, knowledge sharing, and sustained local leadership.

1. Introduction

Alappad is a narrow coastal strip in the Kollam district of Kerala, India, sandwiched between the Arabian Sea and backwaters, and is administratively organized into **16 wards** under the Alappad Panchayat. The wards and their elected members (2020) are as follows:

Ward No.	Ward Name	Elected Member	Role	Party	Reservation
1	AZHEEKAL-A	T Shyma	Vice President	INC	Woman
2	AZHEEKAL-B	Premachandran T	Member	INC	General
3	AZHEEKAL-C	C. Baby	Member	INC	Woman
4	AZHEEKAL-D	Syamkumar S	Member	CPI(M)	SC
5	AZHEEKAL-E	Prajith V	Member	CPI(M)	General
6	Srayikkad	Maya T	Member	Independent	General
7	Parayakadavu	Liju P	Member	CPI(M)	General
8	Kuzhithura	Remya R	Member	CPI(M)	Woman
9	Alappad	Praseethakumari	Member	INC	Woman

10	Cheriazheekal-A	Ullas U	President	INC	General
11	Cheriazheekal-B	Shiji S	Member	INC	General
12	Cheriazheekal-C	Saritha C	Member	INC	Woman
13	Kochu Oachira	K Hajitha	Member	INC	Woman
14	Pandaraturuthu-A	N Biju	Member	CPI	General
15	Mookkumpuzha	Udayakumari	Member	INC	Woman
16	Vellanathuruthu	Sujimol S	Member	CPI(M)	Woman

(Source: Kerala LSG election data)

In the 2004 Indian Ocean tsunami, Alappad was one of the most severely affected communities in Kerala, with **132 lives lost** in the local area. Several higher-level reports estimate that over **230,000 people died globally** in the tsunami disaster across multiple countries.

At the time of the tsunami-readiness interventions, the **Panchayat President** of Alappad was **U. Ullas** (who, in personal recollections, notes he was 18 during the 2004 event).

In 2023, as part of the Tsunami Readiness Program undertaken in the Alappad community, the work focused on restoring first-mile connectivity, promoting evacuation readiness, and embedding tsunami awareness in daily community life as part of the 11 indicators adapted by UNESCO IOC and INCOIS. India.

Tsunami Risk Reduction Activities (Sep 2023–Feb 2024)



Figure 1: Timeline of events conducted in Alappad as part of the Tsunami Readiness Initiative

This report is organized into eight sections that collectively document the Tsunami Readiness Program activities undertaken in Alappad during 2023–2024. Following the introduction, **Section 2** details the participatory community risk-mapping process and field engagements that informed local hazard understanding. **Sections 3 to 5** describe the educational and awareness initiatives carried out through schools, women's networks, and community events during Tsunami Awareness Week. **Section 6** outlines the integration of these findings with local governance and emergency-planning mechanisms, while **Section 7** summarizes key outcomes and lessons learned. **Section 8** presents insights from focus-group discussions conducted under the E4Life Ph.D. Program, capturing diverse stakeholder perspectives on preparedness and response. The final part consolidates **recommendations** across warning dissemination, evacuation, training, and shelter management, aligning them with the **Community Tsunami Ready Indicators (CTRI)** framework established by UNESCO-IOC and INCOIS.

2. Community Risk Mapping and Participatory Fieldwork

The initiative began with an extensive community hazard-mapping and participatory field exercise designed to capture Alappad's unique geomorphology and local disaster experience. A transect walk

was first conducted along the coastal and backwater corridors of Azheekal and Cheriazheekal—the two wards most affected by the 2004 tsunami. In this participatory approach, local residents and officials accompany researchers through the settlement to observe and discuss key features such as elevation, drainage, and land use. A resource map was then developed to visualize these observations, marking important community assets like schools, temples, health centers, and shelters, alongside vulnerable and low-lying zones.

The mapping exercise took place in September–October 2023 at the Alappad Panchayat Hall and was attended by 13 ward members of the Panchayat, along with a team of more than 25 students and researchers from Amrita Vishwa Vidyapeetham. Community members were divided into groups and asked to draw their local area on A4-sized sheets, identifying landmarks, evacuation routes, and vulnerable points based on their lived experience. With guidance from the university team, these sketches were later compiled and digitized onto larger maps, where participants collaboratively marked areas requiring signage, sirens, shelters, and dissemination points. Ward members verified each feature and ensured that local names and landmarks were correctly represented.

The finalized maps served as a bottom-up spatial record of community knowledge and risk perception, complementing scientific hazard models and deepening local ownership of the preparedness process. The session also encouraged open discussions among residents, ward representatives, and researchers on possible interventions to strengthen evacuation and early warning systems. See Figure 2 for the resource map prepared through community participation and Figure 3 for photographs of the field mapping exercise held at Alappad Panchayat.

Contributes to CTRI 2: Designated and mapped tsunami hazard zones; **CTRI 1:** Community tsunami risk reduction planning.

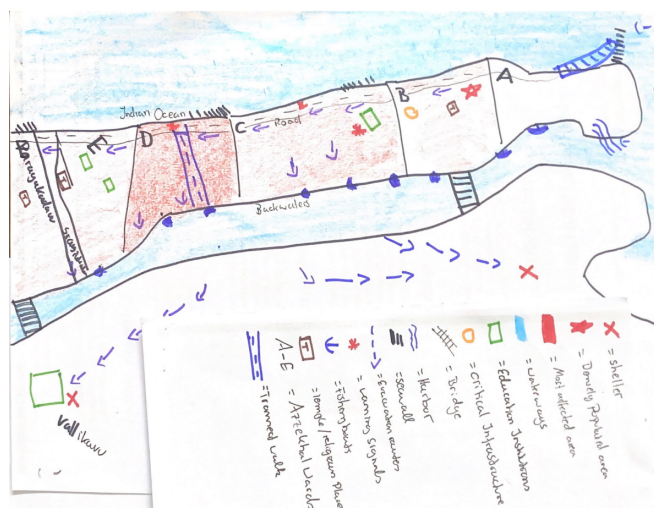


Figure 2: Resource Map of Alappad



Figure 3: Photos of community risk mapping conducted at the Alappad Panchayat in the presence of the panchayat president.

3. School-Based Tsunami Awareness and Education

Recognizing the central role of schools as both safe shelters and communication nodes, **Tsunami Awareness Week (2–4 November 2023)** was organized across three educational institutions in Alappad: **LP School Srayikkad, Azheekal School, and Cheriazheekal School.**

At the LP School Srayikkad, teachers and university facilitators conducted an interactive session on “What is a Tsunami?” followed by a **drawing competition** for children aged 5 to 10. Through colours and imagination, students depicted waves, safe zones, and families evacuating to higher ground, turning complex hazard concepts into relatable imagery. Refer to Figure 4 and Figure 5 for visuals of school-based tsunami awareness programs and student activities.

At Azheekal School, middle-school students and their grandparents participated in a “**Preparedness Scavenger Hunt,**” solving riddles related to evacuation and emergency kit items. The winning pair received a **family emergency kit** aligned with **KSDMA’s emergency-packing recommendations.**

At Cheriazheekal School, upper-level students engaged in **participatory evacuation mapping**, sketching their school environment, locating safe zones, and identifying challenges for elders and children. Teachers integrated the maps into classroom discussions, reinforcing disaster education through spatial awareness. Lower primary school students participated in a painting competition on the theme of “Tsunami and Its Impact on People”. After the competition, three paintings were selected, and prizes were distributed to the winners.

Altogether, more than **230 students** participated in these activities, transforming schools into active centers of tsunami preparedness.

***Contributes to CTRI 5 & 6:** Development of outreach and public education materials; at least three annual educational activities.*



Figure 4: Prize Distribution of the painting competition on the topic " Tsunami and Its Impact on People".



Figure 5: Tsunami Awareness Programs conducted in schools

4. Women- and Fishermen-Led Evacuation Mapping and Community Workshops

On 4 November 2023, a **Women's Evacuation Mapping Workshop** was conducted at the **Azheekal Temple hall**, drawing participants from local women's self-help and livelihood groups. In small breakout teams, participants developed their own hand-drawn evacuation maps, discussing obstacles such as narrow lanes, elderly dependents, limited transport, and clothing or cultural constraints affecting women's mobility. Most of the women had experienced the previous tsunami, so they were aware of the real challenges faced during the evacuation. They also explained that, during the last tsunami, the evacuation was carried out entirely by boat.

These sessions surfaced critical gendered insights often overlooked in conventional disaster plans, for example, the lack of gender-segregated sanitation at shelters or challenges faced by mothers with small children during evacuation. By mapping their realities, women articulated not only the physical pathways but also the social dimensions of safe evacuation. The workshop concluded with a consensus map integrating all group inputs, which was later shared with the panchayat and local school for awareness display.

Later the same day, after the women's session, the team engaged with **fishermen and boat operators** in the community to ensure that male perspectives, local navigation experience, and occupational knowledge were equally represented. Because most fishermen were available only after working hours, the discussion was held informally in the evening near the coastal landing site. Participants described their typical routes, landing points, and response actions during sudden-onset hazards, and they collaboratively identified the safest corridors for evacuation by sea and land. Unlike the women's group, the fishermen preferred to **describe the routes verbally. At the same time, the research team translated their inputs into a participatory resource map**, marking key landmarks, mooring points, and access routes.

This engagement not only captured the unique experiential knowledge of the fishermen but also created a gender-balanced perspective of evacuation dynamics within the same coastal community. Together, these complementary workshops provided a holistic picture of mobility, access, and safety challenges in Alappad during tsunami events. See Figure 6 for photographs from the participatory resource-mapping workshop.

Contributes to CTRI 4 & 7: Production of community evacuation maps; conduct of tsunami exercises through participatory drills.



Figure 6: Photos from the Resource Mapping workshop

5. Tsunami Awareness Week – Community and Intergenerational Engagement

The **Tsunami Awareness Week** became a multi-day, multi-stakeholder platform linking children, elders, women, and local leaders. Activities combined **scientific education, local knowledge, and experiential learning**.

The opening day featured an **online webinar** hosted by Amrita University on “*Understanding Tsunami Readiness and Community Preparedness*,” attended by university students and faculty. The following days shifted to on-site engagements in Alappad’s schools and community spaces, creating a festive yet serious learning atmosphere.

Through competitions, mapping, storytelling, and games, tsunami preparedness was reframed as a **community celebration of safety and knowledge** rather than an abstract warning. Teachers reported heightened student interest, while parents and grandparents shared recollections of the 2004 tsunami, bridging memory and preparedness. Refer to Figure 7 for visuals from the community awareness session held near the Tsunami Memorial.

Contributes to CTRI 5 & 6: Development and dissemination of outreach activities; sustained community education.



Figure 7: Community Awareness session near the Tsunami memorial in Alappad.

6. Integration with Local Governance and Emergency Planning

Parallel to community activities, the project engaged **local governance structures**, including the **Alappad Panchayat**, to align findings with district disaster-management frameworks. Meetings were held with regional coordinators, school principals, and ward members to present evacuation maps, discuss shelter adequacy, and identify communication gaps with the **Emergency Operations Center (EOC)**.

The team recommended integrating **local volunteer networks**, temple loudspeakers, and school-based warning points into official dissemination chains for tsunami alerts. These dialogues established the groundwork for future collaboration between **KSDMA**, **INCOIS**, and local authorities in pursuing Tsunami Ready recognition. See Figure 8 for the mock drill and family preparedness games conducted at Azheekal School.

***Contributes to CTRI 8 & 9:** Integration of tsunami hazards into the community Emergency Operations Plan; commitment to support EOC during a tsunami incident.*



Figure 8: Mock drill and family preparedness games conducted at the Azheekal School

7. Outcomes and Reflections

The Alappad Tsunami Readiness Initiative demonstrated that effective preparedness begins with **local participation, inclusivity, and continuity**. The activities nurtured a renewed sense of ownership among community members who had once been passive recipients of warnings.

Key outcomes include:

- Creation of **three community-validated evacuation maps**.
- Awareness training for over **250 individuals**, spanning students, teachers, and women's networks.
- Establishment of a **communication bridge between the community and the district-level EOC**.
- Integration of **gender perspectives** in evacuation planning and public-education materials.

8. Building Tsunami Resilient Schools in Coastal Communities: Focus Group Discussions with Teachers, Children and Parents

As part of the E4Life Ph.D, researchers, staff, and the program from the Amrita School for Sustainable Futures, Amrita Vishwa Vidyapeetham, conducted Focus Group Discussions (FGDs) to assess community awareness and preparedness for tsunami emergencies. Discussions were held with nine coastal schools, panchayat members, emergency responders (police and fire force personnel), bus drivers, boat operators, school children, and parents. Separate questionnaires were designed for each group based on their specific roles and experiences.

During the discussions, emergency responders emphasized the importance of following proper protocols and evacuation procedures to ensure safety during disasters. Teachers highlighted the need for a reliable and timely early warning system that could alert schools and authorities effectively. Students expressed that swimming should be introduced as a skill-building activity to help them safeguard themselves and assist others during emergencies. Parents pointed out the necessity of having a clear evacuation map, well-marked shelters, and awareness programs to familiarize families with evacuation routes and safety measures.

Overall, the FGDs reflected a strong community willingness to engage in disaster preparedness initiatives and underscored the importance of strengthening early warning systems, capacity building, and coordinated evacuation planning to enhance tsunami readiness among coastal communities.

More importantly, the initiative re-instilled confidence in the Alappad community that preparedness is achievable through collective action, lived experience, and sustained engagement. Refer to Figure 9 for photographs of the focus group discussions (FGDs) conducted in schools and community centers.

Contributes to CTRI 1, 5, 6, 7, and 8: by strengthening community risk awareness, public education, multi-stakeholder coordination, and integration of tsunami preparedness into local emergency planning.



Figure 9: Photos of the FGDs conducted

Table 1: List of initiatives and their contributions to CTRI indicators

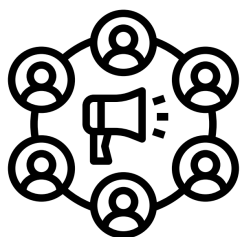
Year / Month	Location / Institution	Key Activity	CTRI Indicator(s)	Outcome / Contribution
Sep–Oct 2023	Alappad Panchayat (Azheekal & Cheriazheekal wards)	Community risk and resource mapping through participatory transect walks	CTRI 1, 2	Identified tsunami-prone areas, shelters, evacuation routes, and communication nodes; developed community hazard maps validated by residents.

Oct 2023	Alappad Panchayat & coastal institutions	Focus Group Discussions (FGDs) on tsunami awareness, early-warning perception, and gendered challenges	CTRI 1, 5, 6, 7, 8	Strengthened multi-stakeholder understanding of preparedness; informed risk-reduction plan and EOP integration.
2 Nov 2023	Online (Amrita University)	Webinar – “Understanding Tsunami Readiness and Community Preparedness”	CTRI 6	Built awareness among university students and faculty; introduced UNESCO-IOC CTRI framework.
3 Nov 2023	LP School Srayikkad	Tsunami drawing competition (“Tsunami and Its Impact on People”) for primary students	CTRI 5, 6	Improved early-age awareness and creative understanding of tsunami safety measures.
3 Nov 2023	Azheekal School	“Preparedness Scavenger Hunt” and family emergency-kit demonstration	CTRI 6, 7	Promoted household preparedness and intergenerational learning through gamified education.
3 Nov 2023	Cheriazheekal School	Participatory evacuation mapping with students and elders	CTRI 4, 6	Produced visual evacuation route maps integrated into classroom lessons; enhanced spatial risk awareness.

4 Nov 2023	Azheekal Temple Hall	Women-led evacuation-mapping workshop with self-help and livelihood groups	CTRI 4, 7	Generated gender-inclusive evacuation maps; documented lived evacuation challenges; strengthened women's leadership in preparedness.
4 Nov 2023 (evening)	Azheekal Coastal Hamlet	Fishermen's focus-group discussion and participatory resource-mapping session	CTRI 1, 2, 5, 6	Engaged working men and boat operators after fishing hours to share hazard knowledge; team recorded spatial inputs to produce a resource map reflecting fishermen's evacuation routes and safe landing points.
2–4 Nov 2023	Alappad Community (schools, memorial, temple)	Tsunami Awareness Week – intergenerational engagement combining art, games, and public sessions	CTRI 5, 6	Linked scientific education with local knowledge; fostered community cohesion and memory-based preparedness culture.
Dec 2023	Alappad Panchayat	Stakeholder consultations and alignment with district disaster-management frameworks	CTRI 8, 9	Integrated tsunami components into Panchayat EOP; established coordination with EOC and local governance.
Jan 2024	Alappad wards & schools	Identification of warning points and dissemination chains (temples, schools, volunteers)	CTRI 10, 11	Designed redundant alert pathways combining formal and community-based systems for 24-hour dissemination.

Feb 2024	Alappad Community	Final validation and reporting with community representatives	CTRI 1-11	Consolidated outcomes and confirmed alignment with UNESCO-IOC CTRI framework; ready for Tsunami Ready certification process.
----------	-------------------	---	-----------	--

Thematic recommendations

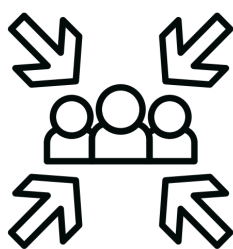


Recommendations:

Warning Dissemination and communication

No.	Stressors identified in co-design	Individual/ household level recommendation	District/community level recommendation	State level recommendation
1	False, delayed or premature warning	NA	Increase transparency and explanation of warning issued	Develop the information flow and evaluation of messages effectively
2	Warnings not localized, lack of impact based warning	Awareness of nature signs, local indications and sounds	Carry out vulnerability and exposed element's assessment at the district level for multi-hazards	Advance in impact-based warnings for district levels
3	Lack of information for taking protective actions	NA	Annual training with the community for action taking for each hazard and at-risk group	Attach information of action taking to warning dissemination (i.e. where to go, what to bring, when to act, how to act)
4	Lack of trust	Follow the instruction of official authorities for safety	Identify trusted sources in the community and integrate the person or	Inform and educate about structures and aims of MHEWS in schools, work

			location in warning dissemination. Have a detailed institutional map.	places, women's networks and panchayat meetings
5	Multi Hazard Early Warning System (MHEWS) not connected to informal warning systems	Engage with indirect sources of warning (i.e. adult children in cities)	Identify informal warning practices and asses for formalization	Build on local capacity and existing local response systems
6,7,8,11	Unfamiliarity with hazard and potential impacts, warning dissemination sources and actions to be taken	Official material and educational resources available at https://sdma.kerala.gov.in	Facilitate awareness campaigns, educational activities and distribute resources	Increase outreach and engagement with multi-stakeholders on awareness such as Universities, Schools, Training centers, employers, social media
9	Not enough lead time	Ensure alertness and ensure connection with official alert systems	Increase effectiveness of dissemination	Develop CAP and smooth collaboration of all parties involved in dissemination chain
10,1	Not connected to warning systems	Establish coverage of all family/household members to warning sources	Assess disconnected places, times, persons	Diversify warning dissemination and communication channels making sure all socio-economic sectors are covered.



Recommendations: Evacuation, Training, (im)mobilities

No.	Stressor	Individual/ household level recommendation	District/community level recommendation	State level recommendation
12	Rural places hard to reach	Identify evacuation routes starting at the household	Map places that are difficult to reach for evacuation in community	Support spatial coverage of evacuation activities through diversifying transport options (i.e. helicopter availability)

16	Lack of evacuation routine	Participate in mock drills with all parties of the household. Alert: The bridge in Alappad can become a bottleneck for evacuation Alert: Swim training for women	Organize annual mock-drills according to KSDMA standards	Support and initiate mock drills at the district level, especially for elderly, women, and children and people who can not swim
15	Lack of signage	Familiarize the household with official routes, signs, and signals for evacuation	Identify suitable places for signage in collaboration with the wards and equip the district with comprehensive barrier-free signage	Make signage material and official information on sources, signs, and indications of evacuation available to the district level and promote implementation
13	(Im)mobility of elderly, persons with disability and children	Report special needs requirements to the ward representatives.	Provide special assistance for households with special needs	Integrate gender, age, mentally unstable and persons with disabilities and others in need of assistance into the DRMC.
14	Reluctance to evacuate without all family members	Discuss action taking with the family ahead and follow instructions of authorities	Organize awareness campaigns and provide information on rescue operations to showcase relief efforts	Develop rescue material in collaboration with the communities to raise awareness on relief efforts
17	Not accessible without transport (distance over 5 km)	Assess the availability of suitable transport in the neighbourhood	Map the spatial distance of wards to the shelter and identify household that are a) too far b) not having transport options c) special needs groups Provide and disseminate a transport plan (i.e. Alappad boat availability)	Make a large scale assessment of available shelters by hazard type for the state comprehensive for the public



Recommendations: Shelter

No.	Stressors	Individual/ household level recommendation	District/community level recommendation	State level recommendation
25,	Lack of basic amenities in first 24 hours of a shock and in shelter	Have an emergency kit prepared according to KSDMA guidelines	Assessment of resource surplus available for emergency scenario (i.e. water, food, medical supplies)	Improve readiness of basic amenities for emergency scenario
18, 24	Overcrowded facilities	NA	Seasonal and slow-onset events: assess the Nr. of people in frequently affected households for each ward and allocate beds in shelter accordingly in advance Sudden onset events: Annual update of information available regarding number of households in districts, population density and special needs population to inform capacity allocation of state level authorities	Allocate financial and material resources for seasonally affected districts to build capacity Timely coordination and assessment of temporary shelter capacities in collaboration with district representatives
26	Lack of Safety	Report any incidents, concern, and safety gap to shelter coordinators	Allocate shifts of police to the affected household properties/areas to prevent robbery and crime whilst residents are evacuated Establish a transparent safety plan in the shelter, including night shifts, guardhouses, and sufficient lighting in the facilities	Support districts with staff (state police or military) in case of lack of safety capacity
23	Lack of clean drinking water		Establish water filter purification systems in the potential shelter locations	Invest in the water purification systems at the district level
22	Dietary needs not met	In case of allergies, special requirements or other dietary conditions inform shelter coordination	Provide a list of essential dietary needs based on the cultural context of the district in collaboration with the community	NA

21	Separation of families	Have a name tag for children in the emergency kit	Group families together in a staging area before transporting them. Plan facilities with options for families to spend time together (i.e. communal family areas) whilst separating ladies and gents for sleeping arrangements if they choose to be separated. Have separate sleeping arrangements as a family unit with curtains or cardboards for privacy.	Consult with shelter inhabitants on a regular basis and check if their needs are being met.
25	Psychological trauma	NA	Collaborate with trusted community representatives/psychologists/medical staff to offer free consultations for people	Skill training of Psychologists for crisis and emergency scenarios that are supporting the sheltering persons post-disaster
23, 20	Lack of WASH	NA	Ensure gender-separated clean and accessible toilets as a criterion for consideration of shelter Introduce the menstruation cup to female persons through awareness training	Invest in portable sanitation facilities (i.e. compost toilets) that can be set up in the shelter
19	Seasonal displacement shelter and sudden sheltering needs	NA	Alappad: Co-design an emergency meeting point that is well acknowledged in the community	State level assessment of households prone to seasonal displacement Provide resources for districts to facilitate, maintain and cater permanent and temporary shelter
18	Not enough comfort in shelter	NA	Co-design shelter amenities in collaboration with the communities	Allocate financial aid to districts for facilitating permanent shelter, equipment, and staff to cater the needs

Conclusion and Key Takeaways: Advancing Tsunami Readiness in Alappad

The series of initiatives undertaken in Alappad between September 2023 and February 2024 marks a significant step forward in translating the **UNESCO-IOC and INCOIS Community Tsunami Ready Indicators (CTRI)** into locally grounded action. The process was not limited to awareness campaigns; it evolved into a participatory framework of mapping, dialogue, education, and coordination that strengthened the community's institutional and social capacity for preparedness.

Through the **risk-mapping exercises**, Alappad established a clear spatial understanding of hazard zones, evacuation routes, and resource points (CTRI 1 & 2). **School-based programs** and **Tsunami Awareness Week** activities embedded disaster education into daily community life, particularly among children and teachers (CTRI 5 & 6). The **women- and fishermen-led evacuation workshops** brought gender balance and occupational knowledge into evacuation planning, producing community-validated evacuation maps (CTRI 4 & 7). Engagement with **local governance** ensured that the findings were integrated into the Panchayat's emergency operations plan and communication chains with the EOC (CTRI 8 & 9).

Furthermore, the **Focus Group Discussions** under the E4Life Ph.D. initiative created a platform for multiple voices —students, parents, responders, and boat operators —to reflect on early-warning mechanisms, safety culture, and practical needs, aligning with CTRI 1, 5, 6, 7, and 8.

Taken together, these efforts demonstrate that **Alappad now meets or has made substantial progress toward at least nine of the eleven CTRI indicators**, positioning the community on a strong pathway toward formal **Tsunami Ready recognition**. The initiatives have transformed readiness from an external requirement into a community-owned process, anchored in lived experience, strengthened by education, and sustained through collaboration between local authorities, residents, and Amrita University.



Challenges:

Alappad needs to continue to build on lessons learned from recovery to overcome gaps in preparedness and response capability to sudden-onset multi-hazards. A lack of evacuation signage and routine to evacuate can cause bottlenecks (i.e. bridge) and (im)mobilities of people with disabilities and senior citizens, and incoherence of warning signals can delay information flow in emergencies amplified by lack of public awareness of where to go.



Recommendation:

- Increase awareness campaigns, including annual mock drills with different population groups, sirens testing and interactive learning about diverse hazards (i.e. cyclones), and drawing signage for the area.
- Follow instructions by authorities; facilitate a multi-hazard resilient emergency point on the mainland in addition to instruction (i.e., a hall, field, or area), which serves as the first gathering point in case of a shock. The place has to be accessible and equipped with the most essential items at any point in time. From there, allocation to shelter or further instructions can occur according to authorities. The importance is that citizens know where to go first immediately.
- Build on recovery lessons from Tsunami 2004, and use Alappad as a best-practice example for building resilience by making women from the community active speakers and leaders in forming response capabilities. For example, a community hub run by women for risk reduction (i.e. emergency, livelihood, diseases) or a network of coastal communities resilience led by women and individuals from different societal groups (i.e. “casts system”) and generations spreading their knowledge.
- Close gaps of the seawall at the shores and align the current housing schemes with official flood-hazard maps (min. 50m from the sea).