

Tonoas Island Assessment Report 2024 Smart Island Project

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Smart Island Concept



Executive Summary

The ITU's Smart Villages and Smart Islands (SVSI) Initiative is a digital transformation project designed to enhance connectivity and provide sustainable digital services to remote and underserved communities in developing regions. The initiative aims to boost the well-being and economic prospects of these communities by equipping them with tailored digital solutions and skills to meet their daily needs. It focuses on making digital tools accessible and affordable, thereby improving the quality of life for people in rural and island communities.

The SVSI initiative is currently active in several countries across Asia and the Pacific, including the Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Pakistan, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu. These efforts underscore a broad commitment to integrating digital infrastructure into some of the world's most remote areas.



FIGURE 1: MAP OF THE PACIFIC REGION

Tonoas Island in the State of Chuuk has been chosen by the Federated States of Micronesia National Government as the site for the pilot Smart Island project. Tonoas, an island in the Chuuk lagoon, faces challenges due to its isolated location, dispersed population, and reliance on agriculture, fisheries, and tourism. The ITU's SVSI Initiative aims to provide tailored digital solutions to improve connectivity and economic prospects. Stakeholder engagement is crucial for effective communication and collaboration in implementing the initiative.

The needs assessment revealed that connectivity in Tonoas is hindered by unreliable electricity, limited infrastructure, and expensive satellite broadband. To address these issues, improved broadband networks, affordable internet options, and digital skills training are needed. Access to devices and internet services must be made more affordable and accessible to bridge the digital divide.

The lack of digital services in education, healthcare, government, finance, agriculture, and disaster risk management highlights the need for improved infrastructure, partnerships, and capacity building. Addressing these challenges will require enhancing connectivity, establishing public digital hubs, providing digital literacy programs, and integrating digital services across various sectors in Tonoas.

To address Tonoas's digital transformation needs, priority interventions include establishing a community digital hub, providing basic digital training, and implementing e-governance platforms. These efforts aim to improve internet coverage, digital literacy, access to government services, and overall quality of life for residents.

The Smart Island Tonoas Initiative is thus proposed to provide connectivity and sustainable services to disadvantaged communities by leveraging existing ICT infrastructure. Through partnerships and digital literacy initiatives, the project seeks to improve access to essential services and economic opportunities for residents. The initiative includes establishing a digital hub, conducting training programs, implementing online payment systems, and collaborating with organisations to expand digital services in Tonoas.

PART 1: Introduction

As technology continues to advance rapidly around the world, the need for digital transformation in Tonoas has become apparent. This introductory section will delve into the current situation in Tonoas, providing a comprehensive overview of the challenges and opportunities that exist in the area of digital transformation. It will also introduce the Tonoas Smart Island Initiative (TSII), which aims to address these needs by implementing innovative solutions to improve the quality of life for residents. This section will also present the SGDs Joint Programme, which involves various United Nations agencies and aims to drive digital transformation in Tonoas by improving access to technology and digital services for its residents. Following this needs assessment, the Tonoas Smart Island Initiative (TSII) will be launched to catalyse digital transformation, promote digital literacy and foster innovation in the community. This needs assessment report will analyse the current state of digital readiness in Tonoas and identify key areas for improvement to provide the evidence base for the successful implement



of the TSII.

About Federated States of Micronesia (FSM)

The Federated States of Micronesia (FSM) is a sovereign nation located in the North Pacific Ocean, roughly three-quarters of the way from Hawaii to Indonesia. It operates as a constitutional government in free association with the United States, which provides financial support under the Compact of Free

Association (COFA). This agreement is managed by the Office of Insular Affairs within the U.S. Department of the Interior.

The FSM encompasses 607 islands spread over more than 1,000,000 square miles of ocean, with a total land area of 436 square miles that includes mountains, coral atolls, and volcanic outcroppings. These islands are organised into four states: Chuuk, Kosrae, Pohnpei, and Yap. While Yap, Chuuk, and Pohnpei each include outlying atolls, Kosrae is composed solely of a main island. The nation spans two time zones, with Yap and Chuuk 18 hours ahead of Pacific Standard Time, and Pohnpei and Kosrae 19 hours ahead.

As of 2012, the FSM had an estimated population of 107,500. This includes 53,500 residents in Chuuk, 7,800 in Kosrae, 35,000 in Pohnpei, and 11,200 in Yap. The nation experienced an annual real GDP growth of 3.1% and had a GDP per capita of approximately \$4,670.¹ The median age in the FSM is 22.7 years, and the average life expectancy is 71.8 years. Most of the population, 63.4%, falls within the 15 to 64 age range. Linguistically, the FSM is diverse with fifteen indigenous languages categorised into four major groups: Chuukese, Kosraean, Pohnpeian, and Yapese. English serves as the official language and a lingua franca, facilitating communication across the different language groups.

About Tonoas

Tonowas, also known as **Tonoas** or by its Spanish name Dublon, is situated in the Chuuk (formerly Truk) lagoon within the Federated States of Micronesia. The island spans an area of 8.8 km² and has a population of approximately 3,200. A single-lane road, in need of repair, encircles the island, providing land access to its small villages such as Nechap, Kuchua, Sangku, Enin, and Yongku. The local infrastructure includes five schools, three dispensaries, and a post office that serves both the population of Tonoas and the neighbouring island of Eten, which falls under the governance of the Tonoas Municipal Government.

Historically, Tonoas, or Dublon as it was known, served as a strategic headquarters for the Imperial Japanese Army (IJA) during World War II. The island was referred to as Natsu Shima (or Natsushima), meaning "Summer Island," by the Japanese. Notable remnants from this era include an underground bunker that housed the IJA's headquarters, which is now listed on the United States National Register of Historic Places. Additionally, the island features ruins from the Japanese military presence, such as a seaplane anchorage, large fuel storage tanks, concrete bunkers, and an administrative center dating back to the 1920-1930s mandate period, now used as the Tonoas Municipal Government building.

¹ Source: <u>https://www.imf.org/external/datamapper/profile/FSM</u>



FIGURE 3: TONOAS ISLAND SCHOOLS

During World War II, Tonoas was the site of intense conflict when American forces captured the island from the Japanese. The sustained bombing campaign lasted nearly a year, resulting in extensive destruction to the island's infrastructure, including homes, a hospital, electricity supply, roads, and the port of entry. The lagoon surrounding the island was left strewn with over 110 sunken ships and submarines, and more than 400 aircraft.

The legacy of the war continues to impact the islands, particularly the neighbouring island of Eten. Recent studies have indicated that active bombs may still be buried within Eten, posing ongoing risks to the inhabitants and necessitating careful management of the area to prevent accidents.²

Tonoas Island is home to a population of 3,200 residents, with a demographic distribution that skews significantly towards the younger age groups. Specifically, half of the population falls within the 1-20 age range, accounting for the largest demographic segment. This indicates a youthful populace, which has implications for educational services and future workforce development. The 20-40 age group comprises 20% of the population. The 40-60 age group makes up 25%, while only 5% of the population is aged 60 and above.

²Source:

https://www.nps.gov/crps/CRMJournal/Summer2004/article2.html#:~:text=During%201944%20and%201945%2C%20the,tru stee%20by%20the%20United%20Nations



FIGURE 4: THE BOMBING OF TONOAS, TRUK LAGOON, STARTED IN FEBRUARY 1944 AND CONTINUED UNTIL AUGUST 1945. (COURTESY OF MICRONESIAN SEMINAR, POHNPEI.)

Ethnically, the island is predominantly inhabited by Native Tonoas people, who make up 99.7% of the population. The remaining 0.3% consists of other races, likely individuals who have either married into the community or are there for employment purposes. This overwhelmingly homogeneous ethnic makeup underscores a community with deep cultural ties but may also indicate limited ethnic diversity which could affect the dynamics of social integration and cultural exchange.

Regarding disability, a total of 117 individuals in the community are recognized as having disabilities, which are classified into several categories. There are 32 people with visual impairments and 15 with hearing impairments. Additionally, 17 individuals are identified with autism, requiring specialised educational and social support services. The largest group within the disabled population consists of 53 individuals with physical disabilities, specifically those who have lost limbs, toes, or hands.

Smart Islands	Persons with visual impairments	Persons with hearing impairments	Persons with Autism	Other disabilities	Total
FSM (Tonoas Island, Chuuk State)	32	15	17	53 (People with lost limbs, toes and hand)	117

Governance

Tonoas is managed under the Tonoas Municipal Constitution, with a political structure that includes a Mayor, a Deputy Mayor, and council representatives from each of the island's 19 villages. This municipal government is not only responsible for local administration but also for the security of the population, maintained by the Municipal Police. The operations and initiatives of the municipal government are supported by the Chuuk State Government. The 19 villages on Tonoas are as follows:

- 1. Tonof (Tolop)
- 2. Penior (Pelior, Pellor, Perior, Peniyoor)
- 3. Pata (Pada, Paata)P
- 4. Nukanap (Nuukanap)
- 5. Wonpiepi (Woon Piyepi)
- 6. Penienuk (Pelieluk, Perieluk, Peniyenak
- 7. Meseiren (Meseran, Mesieien, Meseeraan)
- 8. Sapun (Sabou, Sabun, Sapwuun)
- 9. Sapou (Sobou, Sopou, Sapwowu)
- 10. Eten Island (Etel, Etten)

Education

- 11. Fankachau (Fengatau, Felkedjau, Faan Kacaw)
- 12. Nukan (Nakan, Nukuan, Lugan, "Nukura", Nuukan)
- 13. Rörö (Rara, Rere, Reere)
- 14. Nukura (Lukulam Nukuna, "Nukan", Nukune)
- 15. Monon (Moalol, Moron, Mwonon)
- 16. Pone (Boenne, Boalle, Pwene) and Subdistrict Sonni (Soni)
- 17. Saponong (Sapotiu, Sopwonog)
- 18. Chun (Ccun)
- 19. Nachap (Nechap, Ledjap, Neecap)



Education on Tonoas Island is primarily provided by government or public schools that offer free education to the people of Tonoas. The island has three elementary and two high schools. The three elementary schools serve the nearby villages and communities surrounding the schools, and when students graduate, thev can enroll at either high school. The schools are:

- 1. Nechap Elementary School
- 2. Sino Memorial Elementary School
- 3. Nukuno Elementary School
- 4. South Moneas High School &
- 5. Nukuno Christian High School

The historical development of education in Chuuk, including Tonoas Island, has been influenced by pre-colonial practices, German, Japanese, and American administrations, and post-independence efforts. Pre-colonial education was informal and focused on practical skills and customs. German rule introduced a structured system emphasising basic literacy. The Japanese expanded education with a focus on integrating Micronesian islands into their Co-Prosperity Sphere. Post-World War II, the U.S. introduced an American-style system with English as the medium. Since independence in 1986, Chuuk has managed its own education system, facing challenges such as resource limitations, teacher shortages, and infrastructure issues.

Current challenges include logistical challenges, limited higher education opportunities, and climate change threats. Reforms target improving infrastructure, teacher training, curricula, and technology integration. International aid supports these efforts. Education is compulsory for citizens aged 6 to 13, with a literacy rate of 98.8% for those aged 15 to 24. Challenges persist in infrastructure, teacher preparation, curriculum relevance, high dropout rates, and governance issues. Collaboration and reforms aim to enhance education in Chuuk and Tonoas Island, potentially leading to gradual improvements in the future.

Teachers in Tonoas predominantly come from the local community and are appointed by the Chuuk State Government's Department of Education. While many educators hold qualifications from local colleges or universities outside the Federated States of Micronesia (FSM), the focus remains on empowering local talent and expertise.

For higher education, graduating high school students have the opportunity to pursue associate degrees at the College of Micronesia (COM) campus on Weno Island. COM has expanded its offerings to include degree programs from accredited U.S. universities, providing students with a pathway to quality tertiary education. Scholarships are also accessible, enabling students to further their studies in Guam, Hawaii, the U.S. mainland, Japan, Australia, and the University of the South Pacific.

The current state of school infrastructure demands immediate attention and enhancement. Many classrooms lack adequate ventilation, resulting in uncomfortable and potentially detrimental learning environments. Furthermore, the upkeep of sports fields and public training facilities, including synthetic tracks, is often overlooked, impacting the quality of physical education and extracurricular activities available to students. Addressing these physical shortcomings is essential to creating a conducive and holistic educational experience for students in Tonoas and Chuuk.

Health

Healthcare facilities in Tonoas include three dispensaries: Nechap, Kuchua, and Wonpiepi. These are managed by village nurses trained by the state government and provide basic medical supplies such as pain relievers, skin infection creams, condoms, and simple wound dressings. For more severe medical needs, residents must travel by boat to the main island for treatment. While there are no government hospitals or health centres on Tonoas Island, the current administration is considering



building a health centre next to the Municipal Building. There is also hope that telemedicine services might be introduced in the future to enhance healthcare access.

Access to hospital services in the outer islands is hampered by transportation difficulties between islands, impacting residents' ability to seek medical care. Noncommunicable diseases like diabetes, cardiovascular diseases, and cancers are prevalent due to factors such

as overconsumption of imported packaged food, lack of physical activity, and tobacco use. These lifestyle factors contribute to high rates of NCDs and obesity in the country. Intentional injuries and suicide, influenced by cultural and economic dislocation, particularly affect young adult males. Alcohol use often leads to violent incidents, while tuberculosis (TB) and waterborne diseases are also highly prevalent in the region.

The absence of local doctors necessitates residents to travel to other islands for medical attention, advice, and treatment, resulting in difficult and costly journeys. Inadequate water facilities, sanitation systems, and poor hygiene pose health risks to the community. The lack of a proper drainage system exacerbates these challenges, impacting both health and the environment.

Government Services

The Municipal Government of Tonoas offers crucial services to the community, such as postal services, security provided by the municipal police, and educational facilities. In addition, the Vital Energy Company plays a vital role in the local economy by purchasing coconuts from registered farmers at \$0.50 per coconut, creating a significant income source for the agricultural sector.

However, the poor road conditions in the area are currently impeding mobility and access to essential services, including emergency medical care. This remote and isolated region lacks adequate road infrastructure, which is essential for ensuring safety and promoting economic development.

Recognizing this need, the President of the FSM has allocated \$20 million for the development of road and sewerage infrastructure in Tonoas. This investment aims to address the infrastructure challenges

and enhance the community's overall well-being. The development project is scheduled to be completed within the next four years, promising improved accessibility and better quality of life for residents.

Economy and Finance

The primary sources of income for the Tonoas community include subsistence farming, fishing, employment opportunities within various government bodies such as the Municipal Government, Chuuk State Government in Weno, and private companies like Chuuk Power Utilities, and Vital FSM Petroleum Corporation. These activities play a vital role in sustaining daily life and supporting cultural and family events. Notably, a significant portion of the island's income comes from public sector employment.

The Vital FSM Petroleum Corporation is currently constructing a coconut oil factory on Tonoas, expected to be operational within the next three to five years. This project aims to strengthen the economic infrastructure of the Federated States of Micronesia. The construction phase already provides job opportunities for ten local men, focusing on maintenance and carpentry work.

While the island primarily features small retail operations and lacks major business enterprises apart from the upcoming coconut oil factory, the new facility is anticipated to become a significant economic driver once fully operational, transforming the industrial landscape of Tonoas.

Inter-island trade does not presently play a substantial role in the local economy, but there are growth opportunities in this area. Initiatives from organisations like the Food and Agriculture Organization (FAO) in Fefan and the International Telecommunication Union (ITU) in Tonoas could pave the way for enhanced trade links between islands, fostering economic development and creating a more interconnected regional economy.

In 2023, Tonoas was finally connected to electricity after a 76-year period without power due to infrastructure damage from World War II. However, digital financial services have yet to catch up with this development, presenting a potential area for further growth and modernization.

Agriculture

Agricultural opportunities on Tonoas are constrained by various factors, with the island's rocky terrain and minimal soil presenting challenges for farming compared to its more agriculturally productive neighbour, Fefan. The community typically engages in sporadic planting practices, only replanting crops if there is a demand for sale. This intermittent approach is influenced by the prevalent reliance on imported goods like rice and chicken, which have replaced traditional root crops and fish in local diets. Fishing activities on Tonoas are similarly driven by immediate financial or familial needs rather than being a consistent business pursuit. The limited farming on the island focuses on staple root crops, although detailed information on specific varieties and income generated is scarce due to the noncommercial nature of these activities. The earnings from subsistence farming are modest, serving to supplement community needs rather than generating significant income. Financial stability often depends on remittances and external financial support.

Moreover, the presence of unexploded ordnance from past military activities poses a significant risk, discouraging extensive agricultural development. As a result, Tonoas heavily relies on imported food for sustenance, contributing to a high prevalence of Non-Communicable Diseases on the island.

Climate Change and Disaster Risks

Existing natural disaster risks include typhoons or severe storms, El Niños (currently being experienced in Micronesia), and landslides due to heavy rain. Additionally, one of the other risks is unexploded ordnance (bombs, bullets, shells, grenades, mines, etc.) from WWII that did not detonate when deployed and still pose a detonation risk to farmers and fishermen.

The Tonoas community depends heavily on the Municipal Government, Chuuk State Government, and the FSM National Government for disaster risk management. Although there is no meteorological office or dedicated personnel on the island, there are ongoing training and awareness programs conducted by various governmental organisations, NGOs, and UN agencies. These efforts are crucial in preparing and informing the community about how to respond to natural disasters effectively.

About the Joint-Programme

The Smart Island Initiative in Tonoas is a component of the broader Micronesia Joint Programme (JP), titled "Accelerating SDG Achievement through Digital Transformation to Strengthen Community Resilience in Micronesia." This initiative is funded by the UN Joint SDG Fund, which is dedicated to hastening the achievement of the Sustainable Development Goals (SDGs) by promoting collaboration among various UN agencies. The project is led by the International Telecommunication Union and jointly managed by UNOPS, with strategic oversight provided by the UNRCO and technical support from FAO, ILO, UNESCO, UNICEF, and UNODC.

The JP is active across several Pacific Island nations, including the Federated States of Micronesia (FSM), the Marshall Islands (RMI), Nauru, Palau, and Kiribati. It aids these countries in developing comprehensive digital transformation strategies aimed at improving sector-specific plans in areas such as e-health, e-agriculture, and e-commerce. The overarching goal is to address significant barriers to digital transformation and to assist governments in leveraging digital technologies for inclusive socio-

economic development and heightened resilience to the unique challenges posed by their geographic locations, including vulnerability to climate change and natural disasters.

To implement this vision, the JP selects one island or district from each participating country as a pilot site. These sites are intended to serve as models for using digitalization to enhance service delivery and stimulate broader development. This community-level project is known as the "Smart Villages and Smart Islands Initiative." In the FSM, this initiative is specifically referred to as the Smart Island Tonoas initiative.

About the Tonoas Smart Island Initiative (TSII)

Using the analysed and prioritised needs and the potential solution options in this needs assessment, the Smart Islands project aims to transform small islands into smart islands by providing connectivity and ICT-enabled services to improve the quality of life of island communities. The needs assessment findings provide the guidance for the implementation of a community digital transformation project as envisioned by the ITU Smart Village/Smart Islands initiative. This approach involves consultative processes at all levels to ensure the involvement and buy-in of local officials and residents in developing a project that addresses priority needs identified in the assessment.

The Tonoas Smart Islands initiative specifically targets disadvantaged island communities of Tonoas, focusing on improving well-being and livelihoods through the provision of digitally-enabled services. Using a whole-of-government approach and emphasising sustainability, scalability, and cross-sector collaboration, the project aims to address the unique challenges and opportunities of each island community. By enhancing digital connectivity, affordability, digital skills, and service delivery, the initiative seeks to bridge the digital divide and ensure that all members of the community benefit from the transformation to smart islands. Through a comprehensive needs assessment and a focus on cross-sector collaboration, the Smart Islands project aims to enhance the delivery of essential services such as healthcare, education, and government services through digital technology, ultimately enhancing the quality of life for island communities.

PART 2: Needs Assessment Methodology

In the context of the Tonoas islands digital transformation, it is crucial to conduct a thorough needs assessment in order to determine how best to implement the ITU Smart Villages and Smart Islands model. This approach aims to not only provide connectivity to communities, but to ensure that the connectivity is tailored to their specific needs. By examining the geographical, demographic, socio-economic, and cultural factors of the community, there is a scope to identify better which aspects of the SVSI model will be most beneficial for them. This will allow prioritising the intervention areas and develop solutions that meet the unique needs of the Tonoas islands.

SVSI Pillars

The Smart Island needs assessment focuses on four key areas of improvement: making sure everyone can connect to the internet, keeping costs low, helping people learn how to use technology, and providing useful online services. The assessment looks at how reliable and sustainable the internet is on the island, as well as how much it costs to use and access devices. It also checks how well residents understand and use digital technology. Additionally, the assessment considers how online services like education, healthcare, government, finance, agriculture, and disaster management are being provided, making sure the island's digital infrastructure supports these important services. The four pillars are as follow:

Broadband connectivity pillar focuses on evaluating the broadband connection on the island, with particular emphasis on coverage, network resilience, and sustainability. It explores viable solutions to establish reliable and sustainable broadband connectivity that can support the community's needs.

Affordability Pillar examines the cost of connectivity to see that internet connectivity does not become a prohibitive expense for residents earning a modest income. Seeing it from the residents' perspective and exploring strategies to maintain affordability without sacrificing quality. It also considers communityshared internet resources, such as public hotspots and access to digital devices, to enhance overall connectivity without driving up individual costs.

The Digital literacy pillar measures the level of digital skills among residents, the availability of digital literacy education, and the barriers that deter engagement in learning these essential skills. It also explores the scope for a long-term framework to support ongoing participation in capacity-building activities even after the project concludes, ensuring sustained community involvement in the Smart Island initiative.

Relevant Services pillar shifts focus to the digital services that residents can utilise with their newfound connectivity and digital skills. The assessment reviews the current digital and physical services available to the community and identifies opportunities for digitalization to enhance service delivery. The goal is to enable residents to leverage technology to access services efficiently and participate actively in the digital age.

Methodology

The needs assessment for the Smart Island of Tonoas was structured around three main stages described below, and use various techniques to collect and analyse data in order to generate detailed insights into the community's needs and challenges.



Identification: During this phase, the community's needs are carefully assessed without immediately considering potential solutions. This approach ensures inclusivity by recognizing and categorising specific needs across different segments of the community, including men, women, individuals with disabilities, and marginalised or under-represented groups. This methodical separation helps to ensure that all voices are heard, and their unique requirements are documented accurately

Analysis: This phase explains the relationship between identified needs and the necessary data to formulate potential solutions is established. This involves contextualising objectives, prioritising identified needs, and delving into the causes behind these needs. The focus at this stage is purely on gaining a deep understanding of the community's requirements without prematurely suggesting solutions. This thorough analysis aids in crafting a more informed approach to addressing the community's challenges.

Decision Making: This is the stage where potential solutions are identified and evaluated. Some of the identified needs may already be addressed during the preliminary phases, while others might require additional training or resources. The final implementation of the Digital Hub Centre is anticipated to

bridge the digital divide within the community. This stage culminates the process, aiming to finalise decisions that will effectively meet the community's digital needs and foster overall technological empowerment.

Data Gathering Process

The data gathering included one-on-one interviews, focus groups with community women, and additional interviews with community members. A three-day workshop brought together diverse stakeholders, including teachers, students, and representatives from women's associations and the local business community. Participants discussed the problems and requirements linked to the four main pillars and brainstormed several potential solutions.



FIGURE 7: TRAINING ATTENDED BY COMMUNITY MEMBERS, STUDENTS & TEACHERS

Several data collection methods were utilised to gain a thorough understanding of the community's needs and the current digital landscape.

- Surveys were employed to collect quantitative data on the community's views towards existing digital services, identifying needs and desired improvements.
- In-depth qualitative insights were obtained through interviews with key stakeholders, including local officials and community leaders. These interviews were conducted in both one-on-one and group settings, using open-ended questions to explore challenges, opportunities, and expectations regarding the digital transformation of the island.
- Focused group discussions were held to gather diverse perspectives and foster community engagement with specific demographic groups, such as youth, women, elders, and individuals with disabilities. These discussions covered topics such as community needs, digital literacy, internet safety, and the potential impacts of digital projects.
- Workshops were conducted to engage a wide range of stakeholders in collaborative problemsolving, including students, teachers, community organisations, and disaster risk communities. These workshops included brainstorming sessions on digital initiatives, skill development, and infrastructure improvements.
- Observations were made on how community members interacted with existing technology and services in various settings, such as public spaces, schools, and workplaces. These observations focused on the frequency of technology use, accessibility, and any observed issues or challenges.
- Document analysis was conducted to review existing reports, policies, and records to understand the historical and current context of the community. This included examining government reports, NGO publications, school records, and previous survey data to gather information on socioeconomic conditions, education levels, digital infrastructure, and past initiatives.
- Community meetings were held to gather insights concerning digitisation project ideas, gather feedback, and discuss progress. These meetings included presentations on the project's prospective objectives, timelines, and expected outcomes, as well as open questions and suggestions.

PART 3: Community Needs for Digital Transformation

This section presents the information generated from the need assessment stage in the activities. Data collection was conducted through engagement with local government, data from literature and reports, observation and engagement with the people of the island during the visit to the localities, as well as consultative processes during the focused group discussions.

Stakeholder Engagement

Stakeholders in the needs assessment for the Smart Island initiative include all individuals directly or indirectly impacted by the project in the community of Tonoas. This encompasses a diverse range of residents, including men, women, children, elderly individuals, and those with disabilities. The assessment specifically focuses on various demographics within the community, such as youth, adults, and senior citizens. Students, both in high school and higher education, are also crucial stakeholders, along with teachers and administrative staff from local schools who play a key role in the initiative.

Courtesy call to local government

The initial mission for the Smart Island Tonoas Initiative took place on the 9th - 22nd March, 2024. Following the protocol advised by the FSM Department of Transportation, Communications, and Infrastructure for state visits during project implementation, the team made a formal courtesy visit to the Governor and Deputy Governor of the State of Chuuk. The team met with the Deputy Governor, presenting a brief on the project's components, implementation plans, and objectives.

The reception from both the Deputy Governor and the Governor's office was appreciative. The Governor's Chief of Staff advised that the team must meet with the Mayor of Tonoas Island before proceeding to the island. Subsequently, a meeting with the Governor was organised by the Chief of Staff, including the Mayor of Tonoas. In the same meeting, the Mayor of Tonoas facilitated the team's transfer to the island to meet with the Deputy Mayor, who oversees the municipal government operations.



FIGURE 5: THE ASSESSMENT TEAM WITH THE CHUUK STATE LT. GOVERNOR AND CHIEF OF STAFF

During the mission, the National Consultant formally introduced the Smart Island Tonoas Initiative, detailing the goals and anticipated benefits. The visit provided the assessment team an opportunity to gain insights of the local community's lifestyle, challenges, and issues, and discuss how the initiative could help address some of these concerns.

Additionally, the assessment team conducted basic cybersecurity training focused on internet use, emphasising the importance of public awareness to safeguard new or improved internet users against online threats. These include scams, fraud, identity theft, viruses, hacking, spyware, and malware. The training stressed strategies for identifying potential risks and protecting oneself online.

> FIGURE 6: MEETING WITH MAYOR GRADVIN AISEK OF TONOAS



The team also recommended developing specific programs aimed at parents to help them understand the dangers their children might face online, such as exposure to explicit, violent content or the risk of being targeted by predators for grooming. Additionally, initiatives to combat cyberbullying among youth were proposed as part of the campaign under this program, highlighting the comprehensive approach to enhancing digital literacy and safety in the community.



FIGURE 8: TRAINING ATTENDED BY STUDENTS, TEACHERS AND COMMUNITY MEMBERS

Stakeholder engagement

The preparation for the assessment involves a consultative process that incorporates stakeholder engagement and on-the-ground field assessments. This approach ensures compliance with ITU and the UN standards, as well as adherence to the FSM National and State protocols. The primary objective of this stakeholder engagement, coupled with the direct assessment, is to facilitate effective interaction between ITU, other UN agencies, the Department of Transportation, Communication & Infrastructure (DTC&I), and all relevant stakeholders. This interaction aims to address the identified gaps in access to digital services for the residents of Tonoas.



A critical preliminary step in the project was the identification of key stakeholders who will play a role at different stages. Their roles are detailed in the table below:

TABLE 2: STAKEHOLDER IDENTIFICATIONS

No	Stakeholder	Importance	Pre/During/Post Implementation
1	DTC&I	Focal Point &	Pre/During & Post Implementation
		Approvals	
2	Vital Energy	Primary Partner	Pre/During & Post Implementation
3	FSM Telecommunications	Primary Partner	Pre-Implementation
	Regulation Authority		
4	FSM Dept. of Education	Secondary Partner	Pre & During Implementation
5	College of Micronesia	Primary Partner	During & Post Implementation
6	Bank of Guam	Primary Partner	During & Post Implementation
7	Chuuk State Government	Secondary Partner	Pre/During & Post Implementation
8	Tonoas Municipal	Primary Partner	Pre/During & Post Implementation
	Government		
9	FSM Telecommunications	Secondary Partner	Pre-Implementation
10	Isolutions	Secondary Partner	During/Post Implementation
11	Chuuk Dept. of Education	Secondary Partner	During & Post Implementation

The second stage involved key meetings with organisations crucial for supporting the logistics of the first mission. The team met with Vital Energy, who agreed to provide essential sea and land transportation due to the absence of public transportation in Tonoas. The CEO committed to organising transportation for the team, facilitating the assessment process.

A significant discussion took place with the President/CEO of the College of Micronesia, who expressed readiness to train the Tonoas community in using their Distance Learning Digital System. Additionally,

the team consulted with the FSM Telecommunications Regulation Authority to gather information on licensed ISPs in Chuuk, ensuring access to the necessary resources.

Meetings with FSM Telecom focused on understanding the existing telecommunications infrastructure on Tonoas and exploring ways to enhance it to meet the digital requirements effectively. These strategic discussions established a collaborative framework with local institutions and businesses, essential for the success of the Smart Island initiative in Tonoas.

Community engagement during the first on-the-ground visit by the project team involved raising awareness about the Smart Island Project's objectives and potential impact on community sustainability. The visit successfully engaged municipal government leaders, community leaders, teachers, and women's groups, gathering feedback to address digital connectivity needs and other community requirements. The insights gained will inform further strategies to enhance digital inclusion and address community needs effectively.

Present State of Connectivity

One of the biggest problems is the lack of a consistent and reliable electricity supply, with solar panels and generators the only alternative. The situation is particularly dire on the island of Eten, which currently has no electricity at all. The cost of installing and wiring electricity is also prohibitive.

Tonoas Island has a single telecommunications tower, located next to the municipal office in the village of Roro. There is also a telecommunications tower on the island of Eten, which helps to transmit signals to both Eten and Tonoas. Voice service is available throughout the island, but the further you get from the tower, the weaker the signal. There are also many dead spots on the island, especially in areas with mountains, hills and dense forests.

The only reliable Internet Service Provider on Tonoas Island is iSolution (<u>https://www.facebook.com/iSolutionsMicronesia/</u>) a reseller of Kacific (<u>https://kacific.com/</u>) Internet. Their packages are detailed in the table below:

KACIFIC & STARLINK DATA PACKAGES

No	Package Details	Cost
Tern	ninal Kit Fee	
1	1.2 Antenna + 2510 Modem + TRX0121 3W Ka Band	\$985.00
	Transceiver	
2	1.2 Antenna + 2010 Modem + iLB3210 BUC Terminal Set	\$627.00
Insta	allations	
1	Wifi Equipment	\$507.00
2	Ethernet Cables	

3	RJ45s	
4	Setup	
5	Providing Pipe	
Prepa	aid Monthly Plans	·
1	EUUS-0029 Gigstarter Simple. 3Mbps download / 3 Mbps	¢110.00
	Upload (Unlimited)	φ110.00
2	EUUS-0030 Gigstarter Every Day. 15Mbps download / 10 Mbps Upload (Uplimited)	\$155.00
3	FUUS-0031 Gigstarter Ultimate, 30Mbps download / 10	
-	Mbps Upload (Unlimited)	\$195.00
Belov	v are plans only compatible with 1.2 Antenna + 2510 Modem	1
1	EUUS-0002 50Mbps Download / 15 Mbps Upload (Unlimited)	\$418.00
2	EUUS-0003 60Mbps Download / 20 Mbps Upload (Unlimited)	\$662.00
3	EUUS-0004 70Mbps Download / 20 Mbps Upload (Unlimited)	\$1,553.00
4	EUUS-0002 100Mbps Download / 20 Mbps Upload (Unlimited)	\$3,071.00
Term	inal Kit free + Wifi Package & Installation + First Month (Pre	paid Monthly
Plans	s) & Upfront fee Total	
1	MDM2010 Set + Installations + EUUS-0029 + \$110.00	\$1,244.00
2	MDM2010 Set + Installations + EUUS-0030 + \$155.00	\$1,289.00
3	MDM2010 Set + Installations + EUUS-0031 + \$195.00	\$1,329.00
4	MDM2510 Set + Installations + EUUS-0029 + \$110.00	\$1,602.00
5	MDM2510 Set + Installations + EUUS-0030 + \$155.00	\$1,647.00
6	MDM2510 Set + Installations + EUUS-0031 + \$195.00	\$1,687.00
7	MDM2510 Set + Installations + EUUS-0002 + \$418.00	\$1,910.00
8	MDM2510 Set + Installations + EUUS-0003 + \$662.00	\$2,154.00
9	MDM2510 Set + Installations + EUUS-0004 + \$1,553.00	\$3,045.00
10	MDM2510 Set + Installations + EUUS-0005 + \$3,071.00	\$4,563.00
Other	Expenses not Covered	·
1	Cement and mix for pipe	
2	Boat & Gas roundtrip for lagoon	
3	Freight Cost of Freeingeneration Chin, Doors, & Doord on Chin, row	ndtrin room and
U U	Freight Cost of Equipment on Ship, Room & Board on Ship rou	nump, room and
	board on island (TA \$50 per day per traveller for non-personal s	sites)
4	board on island (TA \$50 per day per traveller for non-personal solution Sol	sites) d) and extension

•

	SERVICE PLANS	
	PERSONAL BUSINESS ALL	
RESIDENTIAL	ROAM	BOATS
Best for households	Best for RVs, nomads, and campers	Best for maritime, emergency response, and mobile businesses
KEY FEATURES	KEY FEATURES	KEY FEATURES
Unlimited high-speed, low-	Unlimited Mobile Data inland	Unlimited Inland Data
latency internet	Portability	In-motion + Ocean Use
	Pause Service	Network Priority
	<10 mph (16 kph) in-motion	Priority Support
MONTHLY SERVICE PLANS	MONTHLY SERVICE PLANS	MONTHLY SERVICE PLANS
UNLIMITED DATA	UNLIMITED MOBILE DATA INLAND	UNLIMITED MOBILE DATA INLAND
standard \$120/mg	MOBILE - REGIONAL \$150/MO	MOBILE PRIORITY - \$250 /MO 50GB
	Mobile Priority Data available by the GB	MOBILE PRIORITY \$1,000 /MO - 1TB
		MOBILE PRIORITY \$5,000/MO - 5TB
		Additional Mobile Priority Data available by the GB
RECOMMENDED HARDWARE	RECOMMENDED HARDWARE	RECOMMENDED HARDWARE

https://www.starlink.com/service-plans/personal

In addition to the limited satellite dishes for data transmission, the Tonoas lack a physical connection to submarine fibre-optic cables for direct access to a wider network. The absence of an Internet Service Provider (ISP) and microwave links for line-of-sight connections further complicate efforts to establish connectivity. Moreover, essential networking equipment such as routers, switches, and modems is also lacking.



1.Needs Identification

This section contains information concerning the community's needs without immediately considering potential solutions. This approach ensures inclusivity by recognizing and categorising specific needs across different segments of the community, including men, women, individuals with disabilities, and marginalised or under-represented groups. This methodical separation helps to ensure that all voices are heard, and their unique requirements are documented accurately.

Broadband Connectivity

The primary internet service in the Tonoas is provided via satellite, which is expensive relative to the average income of the population. In addition, the satellite connection is unreliable, especially during bad

weather, resulting in frequent service interruptions. These connectivity issues hinder effective communication, limit access to digital learning resources and hinder opportunities for economic development through digital means. The current infrastructure cannot cope with high-demand scenarios, resulting in slow internet speeds that are not suitable for modern digital applications. This digital divide further isolates the community, restricts residents' access to essential digital services and information, and poses a significant barrier to those trying to connect for communication and information purposes.

Connectivity availability and accessibility

Kacific Internet, the main ISP on Tonoas Island, uses high-frequency Ka-band technology, which offers faster speeds and competitive prices. However, this technology is vulnerable to atmospheric moisture, which can exacerbate reliability issues. Rain and high winds have the potential to absorb and degrade Ka-band radio frequency signals, causing interference. Significant interruptions typically occur during severe and prolonged storms. Despite these challenges, Kacific's satellite internet, managed by iSolutions, remains the only broadband provider on the island, serving approximately 35 households and 200 individuals. It is important to note that the quality of FSM Telecom's 3G/4G network service can deteriorate with distance from the tower.

In relation to the SVSI indicator that there is sufficient broadband coverage in the community to enable the introduction of digital services for all, the people of Tonoas Island need at least two additional satellite dishes to improve connectivity and communication capabilities, as well as alternative connectivity providers to ensure reliable and fast internet service. These resources are essential to effectively implement digital technologies and improve services for the island's residents to better meet the demands of the digital age and improve overall efficiency and effectiveness in serving the community.

Connectivity Sustainability



Fig 9: Kacific Satellite Internet Dish – Costly and Weather dependent

To fully benefit from the digital transformation, sustainable broadband networks must be in place to ensure consistent internet connectivity for all residents. The SVSI indicator focuses on having network services that can be maintained without external intervention, ensuring continuous access for the community.

Currently, access to connectivity is dependent on the purchase of a subscription, with disconnection occurring if payments are not made. To promote long-term network sustainability, a network sustainability option can be explored after the pilot project. This will require a mechanism to assist individuals in purchasing subscriptions, possibly through subsidies, incentives and other cooperative schemes to increase the collective capacity to maintain connectivity. The people of Tonga cannot afford the current expensive connectivity options on the island, making the current situation unsustainable. What is needed is the introduction of more cost-effective options, including the future fibre and low orbit satellite technology, which are essential for long-term connectivity solutions to bridge the digital divide and enable residents to fully participate in the digital world.

Connectivity Resilience

According to SVSI Indicators, network resilience is essential for broadband networks to be available at all times and to withstand common weather events. Currently, Kacific Broadband is not reliable during cloudy and bad weather conditions, and with the unpredictable nature of climate change and exposure to disaster risks, there is no backup or redundancy in place to support the digital infrastructure and operations.

To address this issue, alternative connectivity options such as low orbiting satellite solutions and fibre optic cables are needed to provide stability and protection from climate change and disaster risks, despite the costly investment required for digital transformation and their critical role in the community.



Affordability

Affordability is a key factor in ensuring that individuals, communities, and businesses can access and utilise digital connectivity without bearing an excessive cost burden without which there is a risk of persistently wide disparities and exclusion of the marginalised island communities. Addressing affordability barriers is crucial for driving inclusive and sustainable development through digital transformation in Tonoas.

Network Cost

A table presentation concerning the iSolutions Micronesia Data Packages demonstrates that the internet service provider (ISP) charges for the most basic package includes antennas, materials, and installation costing approximately \$1,634.00, plus a monthly rental fee of \$110.00. An ordinary farmer of Tonoas who relies on agriculture and fishing for livelihood cannot afford to invest and pay for the recurring charges of that amount without experiencing substantial financial strain.

There is a need to explore alternative options to provide accessible and affordable internet services to all members of the community. This includes exploring partnerships with local resellers or implementing free public access points to bridge the digital divide and support the social and economic development of Tonoas.

Device Access

Findings from the assessment reveal that mobile phone ownership is prevalent among households, with a significant number owning smartphones and a smaller portion owning tablets, iPads, laptops, or computers. However, it is concerning to note the absence of computers in crucial public spaces such as the town hall and health centres. Furthermore, schools, while slightly better equipped, still lack sufficient computer access for both teachers and students.

Additionally, public lending or shared use of equipment is not available, further limiting access to technology for those without personal devices. The survey conducted as part of this assessment also highlights the limited access to the internet among the population, some people own mobile phones - and most are not smartphones, with a majority of individuals lacking personal laptops or PCs.

Given the SVSI indicator that digital devices are available to the community at home or in public facilities, there is a clear lack of access to devices. As long as seven out of ten people do not own or have access to any type of device, action is needed to ensure that people have access to more and cheaper devices.

Public Internet access

The limited connectivity on Tonoas Island is a concern in the SVSI indicator that calls for shared internet connectivity to be available to the community. The present lack of connectivity can be attributed to the

fact that electricity was only introduced to the island a year ago, and that the local government has not yet prioritised connectivity in the community.

In order to move the island towards digital transformation, there is a need to establish public internet hotspots, especially in schools and government offices. By implementing these hotspots, not only will the people of Tonoas benefit from improved internet access, but it will also contribute to the overall growth and development of the region, bridging the digital divide and opening up opportunities for education, communication and economic development.

Digital Skills

Local government and community leaders in the Tonoas agreed that digital skills play a critical role in the digital transformation of the Tonoas Islands because they enable islanders to access a wealth of information online, which is particularly important in remote areas where traditional sources of information are limited; to create and benefit from new economic opportunities, such as online businesses and access to markets, which require them to have the necessary skills to take advantage of these opportunities. But more fundamentally, digital skills are needed to take advantage of improved communication and connectivity within and outside the islands, which could mean educational opportunities, job prospects, health care and so on. Investing in digital literacy, skills, education, community awareness and engagement is essential for the successful implementation of digital transformation projects in the Tonoas, and for unlocking the region's full potential for economic growth, social development and innovation.

A comprehensive survey was carried out as part of this assessment, with participation from residents of multiple villages on Tonoas Island. The survey sample was carefully selected to ensure representation from a broad spectrum of the local population, taking into account factors such as age, gender, and access to digital resources. Participants in the survey spanned in age from 14 to 52, with an equal distribution between male and female respondents.

Digital Literacy and Education

The survey findings reveal that digital literacy levels among Tonoas residents are primarily at the beginner stage, with only a few individuals possessing intermediate skills and none at an advanced level. As a result, many participants lack essential digital tools such as email accounts and prepared CVs, which could impede their job search efforts and professional communication. The survey also highlights that despite high ownership of digital devices, there is a widespread lack of understanding about their full capabilities.

Younger individuals tend to embrace social media platforms like Facebook and TikTok, as well as messaging services such as Facebook Messenger and SMS, while older residents often rely on younger family members for assistance in managing digital communications. It is concerning that many residents, both young and old, do not fully comprehend the functionality of email or utilise their devices to their full potential. This lack of digital literacy is further exacerbated by the absence of dedicated educational programs in Tonoas, due to the lack of necessary facilities like computers and reliable electricity in classrooms.

This digital skills gap poses significant challenges for residents across various sectors, including youth, teachers, and health professionals, limiting their ability to fully engage with digital opportunities. To address this issue, there is a pressing need for targeted training programs that can equip residents with the skills needed for employment, education, and personal growth. By investing in capacity development initiatives, Tonoas can ensure that its residents are adequately prepared to navigate the digital landscape and seize opportunities for advancement.

Local communities indicated that access to smartphones will likely be more widespread. There is a need now to equip people with the knowledge and skills to use these devices for more than just social media and entertainment. Educational materials and hands-on training is needed to help the islanders to learn how to effectively use digital technology for educational, professional and personal purposes.



FIGURE 10: TRAINING WITH STUDENTS, TEACHERS & COMMUNITY WOMEN

Awareness and Motivation

The SVSI indicator is a reminder to the Tonoas of the potential for community members to improve their digital skills. The reality on the ground is that digital life is still a largely unfamiliar concept, with only a small fraction of the population considered digitally literate. There is a gap in knowledge and access to the resources needed to improve digital skills. Community members revealed a general lack of understanding of the full benefits of the Internet beyond basic communication and entertainment. This limited awareness hinders their motivation to learn digital skills.

There is a need to raise awareness about digital life and what is needed to benefit from it. Digital awareness activities and educational materials that are relevant and easy to understand are needed as an investment to catalyse people's interest and , eventually, to seek a wide range of other digital competencies to help them actively participate in the island's digital transformation.

Community Engagement

In order to ensure successful community engagement in the SVSI project, it is essential that community members feel a sense of ownership and involvement in the initiative. While it is understandable that there has been limited community engagement thus far, as the project is still in its early stages, it is crucial to establish clear communication and foster a sense of unity and collaboration among community members from the outset.

There is a need for comprehensive information packages detailing the objectives and benefits of the Tonoa Smart Island Projects as a way of raising awareness and engaging community members. By providing clear and concise information, community members can better understand the purpose and potential impact of the project, leading to increased support and participation. The project can benefit from a diverse range of perspectives and ideas, ultimately leading to a more effective and sustainable digital transformation.

Relevant Digital Services

The SVSI programme aims to improve village-level infrastructure to facilitate the delivery of digital services and create value through innovative solutions. By forging partnerships with the private sector, development allies and government agencies, the initiative ensures the creation of essential infrastructure to enable digital services. Through meticulous needs assessments, the programme identifies the unique requirements of each community and creates tailored solutions to meet their specific needs. Through a comprehensive government and societal strategy, SVSI seamlessly integrates connectivity and digital platforms across different sectors, fostering collaboration and compatibility. This holistic approach not only advances the achievement of the Sustainable Development Goals (SDGs), but also supports COVID-19 recovery efforts and prepares communities for a post-pandemic digital landscape that focuses on inclusivity.

In this regard, an assessment of public service delivery using digital platforms in areas such as eeducation, e-health, e-government, e-finance and e-agriculture is imperative to improve the efficiency, accessibility and quality of services provided to the Tonoas island community.

E-education

The SVSI indicator points to the need for e-education services for the community. Currently, schools have some devices that are accessible to teachers only, and no computer labs and essential devices like phones, laptops, and computers for students. The absence of internet access further limits educational opportunities and access to digital learning resources. Consequently, teachers and students are unable to engage with modern educational practices, conduct research, communicate effectively, or participate in online courses that could enhance their knowledge and skills.

There is a need for improved network connectivity, essential devices, and access to national e-education systems to support the development of digital literacy and skills necessary for success in the modern workforce.

E-Health

The SVSI indicator highlights the need for relevant e-health services in the Tonoas community, which currently has only three dispensaries managed by village nurses. These dispensaries provide basic medical care, but are limited in their ability to address severe medical needs, requiring residents to travel to the main island for treatment.

The absence of e-health services in Tonoas highlights the need for improved connectivity and videoconferencing facilities at the dispensaries to enable medical consultations. The underlying problem is the lack of connectivity, equipment and software to support e-health services in Tonoas.

E-Government

E-Government is important for the people of Tonoas because it provides them with access to essential services more easily and efficiently, saving them time and resources especially for vulnerable populations who have limited access to traditional government services. This is the indicator of E-government in the SVSI, i.e. leveraging connectivity and digital technologies, e-government services to bridge the gap between the government and the people, ensuring that essential services are accessible to all such as civil registry, permit applications, payment services, and licensing renewals.

However, the lack of connectivity, devices, and software has been a barrier to the initiation of egovernment public services in Tonoas There is the need for partnerships to facilitate relevant government digital services to be made available to the community in Tonoas. Fostering such collaborations among diverse stakeholders to help transform disadvantaged island communities like Tonoas and improve the lives of their residents.

E-Finance

The SVSI indicator suggests that banking and finance online services be available, for instance, for mobile applications, loan applications, investment options, insurance services, remittance services, customer support, and resources ideally should be made available digitally to communities for convenient and efficient access. Currently, only a small number of residents, mostly government employees, have access to banking services on the main island. Others rely on services like MoneyGram or Western Union to handle their financial transactions. The substantial monthly transaction volume, ranging between \$50,000 and \$100,000 sent from the US to Tonoas, underscores this critical dependency. Challenges in Tonoas include lack of infrastructure, limited financial resources, and regulatory barriers hindering the establishment of online banking services and physical branches in these areas.

There is a need to identify the specific services that are lacking and determine the demand for these services. Buy- in and support from financial institutions, government agencies, and other stakeholders is also needed to set up the technology infrastructure, as well as training for community members to understand how to use digital banking services effectively.

E-Agriculture

The Tonoas should benefit from e-agriculture integrated with digital services to access essential resources and information to improve their farming practices and address the community's food security challenges, despite limitations in farming due to rocky terrain and unexploded ordnance. By connecting to the Ministry of Agriculture and Livestock's E-Agriculture Smart Hub, the Tonoa community will be able to access a wide range of resources and support for sustainable farming practices, insights and

collaboration, as well as explore resources and mobile apps, and access resources such as funding applications and a business intelligence centre.

To implement this digital connectivity, as with the rest of the public service requirements here, there is a need for internet connectivity, equipment, training and support, and partnerships with stakeholders to ensure that the content provided is relevant and accessible to the residents of Tonoa.

E-Disaster Risk Management

Incorporating disaster management into public services delivered through a digital platform on Tonga is critical because the island is vulnerable to both slow and sudden onset disasters, exacerbated by the effects of climate change. The island has no digital platform to facilitate communication and coordination with the Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM) and the National Disaster Management Office (NDMO). As a result, they lack access to timely and accurate information on potential risks, early warning systems and evacuation procedures, which would improve their resilience to disasters.

By establishing a digital disaster management platform, communities in Tonoas can help develop, plan and implement measures to reduce risks and effectively manage the consequences of disasters, while supporting public awareness campaigns on disaster risk reduction and the role of communities in building a safer and more sustainable future for communities living in disaster-prone areas in Tonoas.

To initiate digital disaster management services in Tonoas, there is a need for a comprehensive digital platform that would require stakeholder partnerships, funding opportunities and support, capacity building and public awareness campaigns.

2.Needs Analysis

This section focuses on establishing the connection between the identified needs and the necessary data to develop potential solutions. The process involves setting objectives, prioritising needs, and investigating underlying causes. The primary goal is to gain a thorough understanding of the community's requirements without jumping to conclusions or proposing solutions too quickly. By conducting this in-depth analysis, a more informed strategy can be devised to effectively address the challenges faced by the community.

Identified needs and Root Causes

Data show that challenges in digital transformation in Tonoas revolve around the core problem, i.e.:

- 1. The introduction of cost-effective options for digital transformation, such as prospective fibre optics and low orbit satellite technology, can help lower the overall expenses.
- 2. Network Sustainability option will ensure continuous connectivity for the community.
- 3. Access to both low orbiting satellite and fibre optic cable connectivity
- 4. Cheaper Internet package options are necessary to increase digital access affordability.
- 5. More and cheaper devices need to enhance digital skills.
- 6. Public internet hotspot areas
- 7. Training materials and hands-on skills training
- 8. Digital training activities, facilities, and materials
- 9. Incentives learn and participate in the Smart Island Projects.
- 10. Improvement of networks, devices, and access to E-Education in schools is necessary.
- 11. Connectivity and video conference capabilities for health services
- 12. An E-Government portal for communication and feedback from community.
- 13. A digital facility for money-related transactions.
- 14. E-Agriculture to link to the Ministry of Agriculture
- 15. A platform for disaster advisory, early warning, and response preparedness

The lack of connectivity, devices, and software in Tonoas is hindering the digital transformation of the island. The geographical isolation, unavailability of infrastructure, and lack of awareness about the importance of connectivity sustainability are some of the root causes of these challenges. The high cost of investment in the island, coupled with the low income of the people, makes it difficult for businesses to invest in improving connectivity.

The expensive cost of devices and the lack of priority given to connectivity by the local government further exacerbate the issue. The absence of digital literacy initiatives and the failure to recognize the significance of digital living are also major obstacles to digital transformation in Tonoas. The assessment results presented earlier helped to frame the discussion on the priority needs detailed below, together with the expected impact if these core needs are successfully addressed

Priority Needs

- Enhancing internet broadband connectivity: This is a priority need as it is the foundation for all digital transformation efforts. Without reliable internet connectivity, it will be impossible for the community to access digital services, participate in online education, conduct e-commerce, or benefit from other digital initiatives.
- Digital Centre for public use: A digital centre for public use is essential as it will provide a central location where community members can access digital devices, software, and training. This will help bridge the digital divide and ensure that everyone in the community has equal access to digital resources.
- 3. **Digital finance facility:** Access to digital finance facilities is crucial for economic development and financial inclusion. By providing digital finance services, such as mobile banking and online payment platforms, individuals and businesses in Tonoas can engage in digital transactions, access credit, and participate in the digital economy.
- 4. **Digital Literacy and Training:** Digital literacy and training are fundamental in ensuring that individuals have the skills and knowledge needed to navigate the digital world. By investing in digital literacy programs and training initiatives, the community can equip its residents with the tools necessary to take advantage of digital technologies.
- 5. Digital services for governance, education, and health: Implementing digital services for governance, education, and health is crucial for improving the efficiency and effectiveness of public services. Digitising government services, education programs, and healthcare systems can help streamline operations, increase access to essential services, and enhance overall quality of life for driving sustainable development and social progress.
- 6. **Improving the power supply:** Improving the power supply is a priority need as electricity is essential for running digital devices and maintaining internet connectivity. Without a reliable power supply, the community will face challenges in accessing and utilising digital technologies.

If left unaddressed, the lack of access to digital services will severely hinder the community's ability to participate in and benefit from digital transformation initiatives. This will result in limited prospects for digital development, a loss of confidence in digital projects, and widening of the digital divide. Without adequate connectivity, individuals will be left digitally illiterate and unable to take advantage of the opportunities provided by digital technologies. Students will fall behind in their digital education, communities will lack essential government services, and crucial sectors such as education, healthcare, and agriculture will remain limited in their potential for growth and development. Ultimately, the island will continue to lag behind in terms of digital development and miss out on the opportunities for progress that come with embracing digital technologies. It is crucial that action is taken to address the lack of access to digital services and infrastructure in order to ensure that the community can fully participate in and benefit from the digital transformation.

3.Decision Making

In this section, potential solutions are identified and subjected to certain criteria. While some of the identified needs can be addressed in the preliminary stages, others may require further resource consideration. The final implementation of the previously identified core needs is expected to bridge the digital divide within the community. This shortlisting and evaluation of potential options will culminate in a decision as to which activities should be undertaken in the first instance to effectively address the community's digital needs and support the medium and longer term progress of the Tonoas Smart Island Project.

Potential solutions

Engagement with local government, community leaders and community members revealed their perspectives and opinions on how to address the core needs identified in the previous sections. At this 'creative stage' of the assessment, no restrictions were imposed; emphasis is placed only on the relevance and number of potential solutions, rather than on effectiveness, efficiency and feasibility, which will be used to select the most feasible potential solution at a later stage. The potential solutions identified in the table below.

		1 low; 5 high;				
	POTENTIAL SOLUTIONS	Relevance	Effectiveness	Efficiency	Doability	Total score
	1) Enhancing internet broadband connectivity:					
a.	Advocate to government to accelerate the fibre optic cables or installing towers to improve connectivity	2	5	3	2	12
b.	Collaborating with telco companies to provide subsidies or incentives for expanding network coverage	3	3	4	1	11
c.	A community broadband utilises the lower orbit satellite internet technology that provides high-speed internet access, and ultimately cheaper.	3	2	3	2	10
	2) Digital Centre for public use:					
d.	Partnering with UN agencies to establish a community digital hub equipped with connectivity and devices	5	5	4	5	19
e.	Securing funding or grants to purchase digital devices and software for the public to use at the digital centre.	3	1	3	1	8
f.	Collaborating with tech companies to provide workshops on digital skills training	2	1	3	1	7

	3) Digital finance facility:					
g.	Partnering with financial institutions to offer mobile banking services and digital payment platforms for residents in Tonoas.	4	3	2	1	10
h.	Advocating to banks to kickstart digital initiatives and projects.	1	5	1	1	8
i.	Conducting financial literacy workshops and training programs to educate community members on how to utilise digital finance services.	5	2	3	4	14
	4) Digital Literacy and Training:					
j.	Establishing partnerships to offer online digital literacy courses and workshops	5	2	5	5	17
k.	Providing incentives or scholarships for individuals to enrol in digital skills training programs	3	3	2	2	10
Ι.	Collaborating with tech companies or digital experts to offer mentorship programs for community members seeking to improve their digital skills.	4	3	2	4	13
	5) Digital services for governance, education,					
	and health:					
m.	Implementing e-governance platforms to streamline government services and improve efficiency in administrative processes.	5	4	3	3	15
n.	Collaborating with schools and educational institutions to develop online learning platforms and digital resources for students and teachers.	2	3	2	2	9
0.	Introducing telemedicine services and digital health records systems to improve access to healthcare services and enhance patient care in Tonoas.	3	4	4	3	14
	6) Improving the power supply:					
p.	Investing in more solar panels to provide a sustainable and reliable power supply for digital devices and internet connectivity.	4	2	3	2	11
q.	Upgrading existing power infrastructure to reduce disruptions	2	1	2	1	6
r.	Implementing energy-saving initiatives and campaigns to promote efficient use of power and reduce energy consumption in Tonoas.	5	2	2	1	10

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Priority Interventions

1. Community Digital Hub

Partnering with UN agencies to establish a community digital hub equipped with connectivity and devices

While keeping in mind that a reliable broadband internet connection is fundamental for establishing digital services and realising the concept of Smart Islands, a short term solution that cuts across many needs is the establishment of a community digital hub. This could help Tonoas Island people to improve internet coverage and to leverage the benefits of digital connectivity and advance their digital literacy.

Additionally, many users have reported that the quality of FSM Telecom's 3G/4G network service deteriorates with distance from the transmission tower, further emphasising the need for enhanced broadband access that is both reliable and fast. This improvement is crucial to encourage broader participation in the digital economy.



FIGURE 14: MUNICIPAL OFFICE OF TONOAS AND PROPOSED DIGITAL HUB CENTRE

Anticipated Impact

Enhancing digital hub connectivity is expected to significantly improve the lives of Tonoas residents, including students, teachers, women in business, and families at large. This upgrade will facilitate the development of digital literacy through structured programs and peer-to-peer learning initiatives. The expected outcomes of enhanced access to the digital hub include:

- Better access to online resources, such as instructional materials and online services, which raises residents' level of digital literacy.
- Better communication skills that make it easier to communicate with friends, family, and services that live off-island.
- More options for professional growth and online learning, which could enhance employment opportunities.
- More opportunity to establish and grow small local businesses, which would strengthen the island's economy.
- A higher standard of living because of residents' increased access to resources and knowledge.
- Greater effectiveness in public services due to the ability to digitise and streamline processes.
- Enhanced capacity for catastrophe preparedness and response by having access to real-time meteorological data and communication links.



FIGURE 13: PROPOSED DIGITAL CENTRE PROVIDED WITHIN THE MUNICIPAL OFFICE

2. Digital Awareness and Capacity Building

Establishing partnerships to offer online digital literacy courses and workshops

There is an apparent need for basic digital training and awareness among the participants including teachers in the community engagement. Out of the 76 participants in the training session, only 7 owned mobile phones, 3 had personal laptops, and 2 owned tablets. This low level of device ownership is largely due to the historical lack of electricity and connectivity in the area. Additionally, only 22

participants had a Facebook account—often created by friends or family members—and 7 had TikTok accounts. All participants expressed that a lack of understanding of the internet's benefits significantly hinders their motivation to learn digital skills, underscoring the urgent need for awareness-raising and capacity building. Language barriers further complicate the learning process, as instructional materials and device interfaces are typically in English, which is not the native language of many participants. This highlights the need for localising educational efforts, such as developing training materials in the local language.

To effectively reach a broader audience, printed materials like laminated posters and booklets should be made available in common areas such as council buildings and health clinics. Additionally, these resources should be accessible online, allowing downloads for use on various devices. Considering different learning preferences, incorporating interactive and visual learning methods through video tutorials can be particularly effective. Topics could include the basics of using email, navigating the internet, installing apps, and understanding web security.

Anticipated impact:

Expanding this educational initiative to include the outer islands could significantly benefit the community of Tonoas and the wider FSM population. By making these resources available online, individuals from any location can access and utilise them, enhancing digital literacy across the community. Potential outcomes of this awareness-raising campaign may include increased digital engagement, improved security practices online, and a general uplift in the community's competence in using digital technologies to enhance their daily lives and access to services. These awareness-raising initiatives could lead to the following possible outcomes:

- A greater ability to use digital tools and services efficiently due to increased online literacy.
- Improved communication and information access, which promotes better decision-making.
- Easy access to learning materials, which could enhance students' academic achievement in all schools.
- A greater understanding of the advantages of the internet, which could encourage community participation and the uptake of digital services.
- Creation of regional resources for training in digital skills, guaranteeing continued assistance for the community.

3. E-Government

Implementing e-governance platforms to streamline government services and improve efficiency in administrative processes.

Implementing e-governance platforms is perceived to be a highly effective, efficient, cost-effective, and relevant solution to broaden the community's access to government services. These platforms enhance transparency and accountability, allowing citizens to access information and track the progress of their

applications easily. They also streamline administrative processes by reducing paperwork, eliminating redundancies, and automating routine tasks, leading to improved efficiency in service delivery. Additionally, e-governance platforms are seen as cost-effective, saving governments resources that can be reinvested in other priority areas. With widespread access to technology and increasing digital literacy among citizens, transitioning to e-governance platforms is feasible and beneficial for governments looking to improve service delivery and efficiency.

Anticipated impact:

The implementation of e-governance platforms is expected to result in a more efficient, transparent, and citizen-centric government that meets the needs of its constituents effectively and economically. This includes increased accessibility and convenience for the Islanders as they will have easier access to government services and information online, reduce the need for physical visits, and enhance efficiency in service delivery. Such a platform is also expected to increase people's engagement by facilitating two-way communication allowing for feedback and participation.

- Increased accessibility and convenience for the Islanders: they are to have easier access to government services and information through online platforms, reducing the need for physical visits to government offices.
- Improved transparency and accountability: enhances transparency in government operations by providing real-time information allowing them to track the progress of their works
- Enhanced efficiency in service delivery: by reducing paperwork, eliminating redundancies, and automating routine tasks, streamline administrative processes and improve the speed.
- Cost savings: reduces the costs associated with services processes, paperwork, and physical infrastructure, allowing relocation to other priority areas.
- Increased engagement: facilitates two-way communication between governments and the people, allowing for feedback, suggestions, and participation in decision-making.



Fig 15: Tonoas Villagers Identifying Needs & Recommendations for possible solutions

PART 4: Smart Island Tonoas Initiative

Following discussions with local government and community leaders, as well as representatives from various groups, a community project has been developed based on prioritized interventions. The project aims to provide connectivity and a range of sustainable services to disadvantaged island communities in an innovative way. Leveraging existing ICT infrastructure, interoperability, and multi-functionality, this project offers affordable access to digital services for island communities. By collaborating with private companies, development partners, government agencies, UN agencies, and other stakeholders, the initiative ensures the necessary infrastructure is established.

The Smart Island Tonoas Initiative is a community project that addresses digital service needs identified through assessments, providing tailored solutions to meet the community's specific requirements. Emphasising a comprehensive approach involving government and society, the program integrates digital platforms across industries such as business, health, education, and agriculture to promote collaboration and support the achievement of Sustainable Development Goals (SDGs). By encouraging community engagement and delivering culturally relevant solutions, the initiative aims to ensure inclusive and enduring benefits for all community members.

Justification

This project justification highlights the importance of investing in the digital infrastructure of Tonoas to bridge the gap between urban and rural areas and ensure that all residents have equal access to the benefits of technology. Together, we can create a more connected and prosperous community.

The Tonoas Smart Island Initiative will not only improve the quality of life for residents by providing them with access to vital information and resources, but will also attract investment and create opportunities for economic growth on the island. Through partnerships and collaboration, the initiative will work towards providing affordable and reliable internet services, expanding network coverage, and implementing digital literacy to empower locals to fully utilise the resources available to them.

Vision & Mission

Goal: To make Tonoas a smart, connected island where all residents have equal access to digital opportunities and services.

Mission: Through strategic alliances and community participation, we aim to increase network coverage, develop internet infrastructure, provide digital literacy training and improve access to essential services.

Expected Results

Improved connectivity infrastructure and coverage will encourage local people to become more digitally literate and skilled, and by improving access to essential services through digital solutions, the initiative is expected to significantly improve Tonoas. In addition, by providing reliable communication networks, the initiative aims to increase the community's resilience to bad weather and power outages. Making internet services more accessible and affordable for all residents is one of the key goals, which will ultimately transform the neighbourhood into a more empowered and connected community.

Objectives

- Address the 'Dead spots' along Tonoas Compact Road to improve network coverage.
- Establish a digital transformation hub to provide access to connectivity, develop digital capacities and promote creativity.
- Provide offline choices so that those in places with spotty internet access can still access services.

Key Project Activities

Establish Community Digital Hub Conduct Community Digital Training Initiatie E-Government services

Deliverables

- 1. Community digital transformation hub
- 3.. Resilient technology solutions skills
- 5. Online payment system implementation

Division of tasks

The division of labour among stakeholders , based on the stakeholder analysis that was previously stated in the section above, is as follows

Primary stakeholders:

• National government: Specifically, the Department of Transport, Communications and Infrastructure is the focal and implementing partners, respectively. They play a crucial role in coordinating and implementing the project.

- State Government: Chuuk State Government & Tonoas Municipal Government on the ground installation
- Vital Energy: Provision of Logistics pre, during and post installations
- UN agencies: These agencies are key players in the joint project, providing support and resources to ensure the success of the initiative.

Complementary stakeholders

• College of Micronesia :While their involvement may not directly impact the project's development and success, their role in the overall digital training is important for understanding the context and digital environment.

Oversight stakeholder:

- Tonoas Municipal governments: These governments own resources and are wellconnected to the community, providing guidance and support to ensure the smooth running of the project.
- Digital transformation steering committee: This committee is composed of technical experts and partners who have in-depth knowledge of ongoing digitization efforts. They play a crucial role in decision-making and keeping stakeholders informed about the progress of digitization efforts in the region.

Beneficiaries:

• Tonoas community: The community is both the principal beneficiary and the principal actor in the digital transformation of the island. They are actively involved in the project and will benefit from improved connectivity, digital skills, and access to essential services.

Project implementation stages

July - August 2024: Project Induction

- Needs assessments validation to confirm the necessary interventions
- Project partnership and coordination under the leadership of the government and in partnerships with UN Joint Programme and private sector companies
- Planning for the installation of the Community Digital Transformation Hub
- Procurement of goods and services

September - October 2024: Project Implementation

- Installation of the the Community Digital Transformation Hub
- Training sessions for residents on digital literacy and skills on diverse topics
- Discussion with local telecommunications companies for connectivity expansion

• Decision concerning the adoption of digital public services by the government

November - December 2024: Project Maturation

- Implementation of technology solutions to enhance network stability and resilience
- Monitoring and evaluation of project outcomes
- Delivering progress reports to stakeholders
- Hand over to the government
- Closure

Immediate project tasks

Establish a local task force committee:

Establishing a local task force committee is crucial for ensuring sustainable development and local engagement in Tonoas. The taskforce will facilitate continuous local coordination, fostering community ownership that extends beyond the project's completion. The steps to implement this include identifying key stakeholder groups, ensuring gender equality, defining clear roles and responsibilities, setting regular meetings, and creating a robust communication plan to maintain momentum and transparency in digital transformation efforts.

- Designate important stakeholder groups and taskforce representatives,
- Gender Equality.
- Clearly describe the tasks and duties of the taskforce and formally establish it.
- Set up frequent taskforce meetings to plan and oversee the Smart Island programs' implementation.
- Educate taskforce participants on the advantages of digital transformation.
- Create a communication plan for the taskforce to forward the agenda for digital transformation.

Develop a digital literacy training activities

Digital literacy is fundamental in enabling residents to harness the benefits of technology. This program aims to address the gap in skills and awareness in Tonoas by collaborating with the FSM DTC&I Digital team and local education institutions to design and deliver tailored digital literacy training. The program will include web-based and downloadable resources, comprehensive training sessions, and a train-the-trainer component to ensure long-term sustainability. It will also involve continuous assessment and adjustments based on community feedback to optimise learning outcomes.

• Consult with the FSM DTC&I Digital team on digital literacy and other Digital literacy institutions.

- Work with the selected group to establish a collaboration agreement in order to create a digital literacy program.
- Consult with TD&I on web or cloud storage of downloadable electronic versions of these items.
- Make plans for the partner group to hold a number of training sessions on the island, making sure that everyone who lives there can attend.
- Consult with the College of Micronesia on Digital Literacy Program
- Coordinate with local schools and community centers to host these training sessions.
- Introduce the train the trainers for Teachers and community leaders that can provide future trainings and support to the community.
 - Consult with DTC& I Digital team to do follow up sessions and attend to queries and new ideas.
 - Assess the program's efficacy using evaluations and feedback and make any necessary program adjustments considering these findings.

Introduction of the Bank of Guam Digital Financial Services

Financial inclusion is critical for economic stability and growth. Introducing the Bank of Guam's Digital Financial Services in Tonoas will address the current reliance on remittances and improve residents' access to financial services. The implementation steps include forming a partnership with the Bank of Guam, promoting understanding of digital financial tools through targeted awareness campaigns, and conducting hands-on training sessions to ensure residents are well-versed in using these services securely and effectively.

- Establish partnerships with Bank of Guam
- Collaborate on awareness initiatives to promote and improve understanding of the Bank of Guam App
- Organize training sessions on the Bank digital services, emphasising benefits and security.
- Develop a user-friendly tutorial for navigating the app's features and support system.

Explore partnership with UNESCO, UNICEF and College of Micronesia for the Online Education

Online education is a revolutionary endeavour that will not only empower educators and offer them chances to grow in their careers, but it will also act as an example for the society at large, demonstrating the possibilities of digital literacy and online learning. But to put this into practice, we should start small and work our way up. Examining UNESCO and the College of Micronesia's (COM) work on digital transformation is a good place to start.

Their objective is to digitise teacher education courses and make them accessible on the Moodle learning environment. During an informal consultation with Ms. Vera Ushurova of UNESCO, she confirmed that they would only need hardware to conduct the training and once the implementation is done in Tonoas they can execute training. This is crucial to Tonoas teachers' ability to facilitate learning given that the schools do not have proper digital training facilities.

• Formal collaborations with the College of Micronesia on Digital training and training materials.

- Consultations with UNESCO the requirement of digital devices training
- Establish the Tonoas digital hub as the as a learning hub where learners can access the internet and study in a conducive environment.
- Monitor and evaluate the effectiveness and impact of the initiative.



Conclusion

Tonoas, an island situated in the Chuuk (formerly Truk) lagoon within the Federated States of Micronesia, spans an area of 8.8 km² with a population of 3,200 and a single-lane road, in need of repair, has the characteristics by unique geographical isolation, remote and scattered islands with small and dispersed populations, making access to essential services difficult and infrastructure development, including telecommunications, challenging, expensive and difficult to achieve economies of scale. Their reliance on agriculture, fisheries and tourism makes them vulnerable to shocks and global economic fluctuations, as well as to natural disasters and the effects of climate change. All of these hinders investment in infrastructure and advanced digital technologies and leads to digital divides.

The ITU's Smart Villages and Smart Islands (SVSI) Initiative is a digital transformation project designed to enhance connectivity and provide sustainable digital services to remote and underserved communities in developing regions. The initiative aims to boost the well-being and economic prospects of these communities by equipping them with tailored digital solutions and skills to meet their daily needs. It focuses on making digital tools accessible and affordable, thereby improving the quality of life for people in rural and island communities.

The stakeholder engagement for the Smart Island Tonoas initiative involves consulting with various community members, including students, teachers, parents, and local government officials. The team met with the Deputy Governor and Mayor of Tonoas to present the project's goals and plans. Basic cybersecurity training was conducted to educate residents on online safety. Stakeholder and community engagement during the visit brought about the project's objectives and gathering feedback to address digital connectivity needs and other community requirements.

The current state of connectivity in Tonoas is characterised by the unreliable electricity supply and lack of infrastructure for telecommunications. While voice service is available, the signal weakens the further one is from the towers, with many dead spots on the island. Data transmission is limited, and there is no direct connection to submarine fibre-optic cables for wider network access. The absence of an ISP, microwave links, and essential networking equipment further hinders efforts to establish a reliable and sustainable connectivity on the island.

The needs assessment revealed that broadband connectivity is primarily provided through satellite technology, which is expensive and prone to interruptions during bad weather. This limits access to digital resources, hindering communication and economic development opportunities. The current infrastructure cannot handle high demand, resulting in slow internet speeds. Sustainable broadband networks are crucial for consistent internet access, and options such as subsidies are needed to make subscriptions more affordable. Network resilience is also important, especially in the face of climate change and disaster risks, necessitating the exploration of more reliable technologies like low orbit satellites and fibre optic cables.

The high costs of internet packages and lack of access to devices are barriers for many community members, particularly those in vulnerable situations, such as farmers. Alternative options, like partnerships with local resellers or public access points, need to be explored to bridge the digital divide. Additionally, the absence of computers in public spaces, limited access to devices, and lack of public internet hotspots on the island highlight the urgent need for action to provide affordable internet services and improve digital connectivity for all residents of Tonoas.

With regard to digital skills, a survey revealed that residents have primarily beginner-level digital literacy, which hinders their ability to access educational, job, and personal growth opportunities. There is a need for targeted training programs to address this digital skills gap. Additionally, raising awareness about the benefits of digital life and engaging the community in the Smart Island Projects is essential for successful digital transformation in the Tonoas.

The status of relevant digital services highlights the need for improvements in various sectors. Eeducation lacks essential devices and internet access for students and teachers, hindering modern educational practices. E-Health services are limited to basic care, necessitating improved connectivity for medical consultations. E-Government services are essential for providing access to essential public services, but face barriers in connectivity and technology. E-Finance services are lacking, with most residents relying on traditional methods due to infrastructure challenges. E-Agriculture integration with digital services is crucial for sustainable farming practices and food security in Tonoas. Lastly, E- Disaster Risk Management is vital for improving resilience to disasters, but lacks a digital platform for communication and coordination. Overall, partnerships, funding, and capacity building are needed to enhance digital services and support the Tonoas community in various sectors.

Analysis of the perceived needs highlights that the lack of connectivity, devices, and software in Tonoas is hindering the digital transformation of the island. The geographical isolation, unavailability of infrastructure, and lack of awareness about the importance of connectivity sustainability are some of the root causes of these challenges. The high cost of investment in the island and the low income of the people make it difficult for businesses to invest in improving connectivity. The absence of digital literacy initiatives, lack of priority given to connectivity by the local government, and the expensive cost of devices are major obstacles to digital transformation. The priority needs to address these challenges include enhancing internet broadband connectivity, establishing a digital centre for public use, providing digital finance facilities, offering digital literacy and training programs, implementing digital services for governance, education, and health, and improving the power supply. If these core needs are not successfully addressed, the community's ability to participate in and benefit from digital transformation initiatives will be severely hindered, leading to limited prospects for digital development and widening of the digital divide.

Based on the needs analysis, the priority interventions for Tonoas Island include the establishment of a community digital hub to improve internet coverage and digital connectivity. This would benefit residents, particularly students, teachers, women in business, and families, by enhancing digital literacy through structured programs. Additionally, there is a need for basic digital training and awareness with a focus on localising educational efforts and incorporating interactive and visual learning methods to reach a broader audience. Implementing e-governance platforms is also seen as a cost-effective and efficient solution to broaden the community's access to government services, leading to improved transparency, accountability, and efficiency in service delivery.

A community project called the Smart Island Tonoas Initiative aims to provide connectivity and sustainable services to disadvantaged island communities by leveraging existing ICT infrastructure and collaborating with various stakeholders. The project focuses on digital service needs, promoting digital literacy, and access to essential services to improve the quality of life and economic opportunities for residents. The project involves establishing a community digital hub, conducting digital literacy training, implementing online payment systems, and partnering with organisations such as the Bank of Guam and UNESCO to expand digital services in Tonoas. The project is implemented through stages and involves creating a local task force committee, developing digital literacy training activities, introducing digital financial services, and exploring partnerships for online education.

Recommendations

The proposed Tonoas Smart Islands Initiative is but a pilot project to catalyse a more sweeping community digital transformation that is needed for promoting economic growth and ensuring all residents have access to the benefits of connectivity. To achieve this, the government could consider implementing policies , programmes and partnership to foster a more connected and digitally empowered population in Tonoas.

The government could consider implementing policies that incentivize private sector investment in improving connectivity. One effective strategy would be to offer tax breaks or subsidies to companies willing to expand their digital infrastructure in the region. By encouraging private sector involvement through financial incentives, Tonoas can accelerate the development of its digital ecosystem and promote economic growth.

With regard to access to affordable internet services, it is crucial to develop regulations that mandate accessibility for all. This can be achieved through partnerships with local internet service providers or the establishment of community networks. By setting clear guidelines and requirements for internet access, the government can guarantee that even the most remote communities in Tonoas are connected. Given the vulnerability of Tonoas to climate change and natural disasters, it is essential to invest in building resilient digital infrastructure. This could involve the installation of low orbit satellites to complement the forthcoming roll out of the fibre optic cables.

Partnership with UN agencies and the private sector can play a crucial role in providing affordable devices and internet access to all residents of Tonoas, particularly those in vulnerable situations. By pooling resources and expertise from both sectors, it becomes possible to offer subsidies or discounts on devices and connectivity plans, making them more accessible to low-income individuals. This collaborative approach can help bridge the digital divide and ensure that no one is left behind in the digital age.

A comprehensive digital skills training program tailored to the specific needs of Tonoas residents is essential for maximising the benefits of improved connectivity. This program should include basic digital literacy training as well as more advanced skills tailored to sectors like agriculture and healthcare, which are vital to the local economy. By empowering residents with the necessary digital skills, Tonoas can unlock new opportunities for growth and development.

The implementation of digital services in key sectors such as education, health, government, finance, and agriculture can significantly improve service delivery and opportunities for residents in Tonoas. By digitising essential services, it becomes easier to access information, communicate with authorities, and conduct transactions online. This not only enhances efficiency but also opens up new avenues for innovation and growth in the community.

APPENDICES

Appendix A: Procurement List

Section II: Schedule of Requirements

A. UNOPS requirements are comprised of the following lots:

Lot No	Item #	Description of the Item	Quantity
1	Federate	ed States of MICRONESIA (FSM)	
	1	Supply, Delivery and Installation of 15 " Laptop (Windows 11 Pro, Microsoft Office 2019, 3yrs Antivirus, 16gb RAM, 500GB Normal HDD) for the Federated States of Micronesia	15 Units
	2	Supply, Delivery and Installation of Laptop Docking station for the Federated States of Micronesia	15 Units
	3	Supply, Delivery and Installation of 24" Screens for the Federated States of Micronesia	15 Units
	4	Supply, Delivery and Installation of HDMI cable (2 metres) for the Federated States of Micronesia	16 Units
	5	Supply, Delivery and Installation of Uninterrupted Power Supply (UPS) 1500VA for the Federated States of Micronesia	18 Units
	6	Supply, Delivery and Installation of external wireless Keyboard & Mouse station for the Federated States of Micronesia	16 Units
	7	Supply, Delivery and Installation of 55" TV Screen with wall mounting kit for the Federated States of Micronesia	1 Unit
	8	Supply, Delivery and Installation of Internet with Satellite Dish, Modem and Wi-Fi links for the Federated States of Micronesia	1 Unit
	9	Supply, Delivery and Installation of Multi-function All in One Black & White copier/printer/scanner and 10 Toners for the Federated States of Micronesia	1 Unit
	10	Supply, Delivery and Installation of 18 BTU Wall Mount Air- condition with fittings for the Federated States of Micronesia	1 Unit

11	Supply, Delivery and Installation of Double Power points/sockets for the Federated States of Micronesia	18 Unit
12	Supply, Delivery and Installation of Workstations for the Federated States of Micronesia	9 Units
13	Supply, Delivery and Installation of External/Internal Infrared Power over Ethernet IP Based Cameras with Cable for the Federated States of Micronesia	4 Units

B. Technical specifications for Goods and Comparative Data Table

01	Supply, Delivery and Installation for the Federated States of Micronesia
	1. Supply, Delivery and Installation of Laptops
	1.1 Laptop
	• 15" Laptop
	 Processor – I7
	 Memory - minimum of 16 GB RAM
	Hard Drive:
	 a minimum of 500GB Normal HDD
	 a maximum of 1TB Normal HDD
	PCI-e Graphics card
	Audio - High-definition audio
	 Optical Drive: Internal or External USB DVD R/W 24X (please specify)
	Network Card - Gigabit Integrated Ethernet
	 Wireless Connectivity: Internal or USB Wi-Fi 802.11 AX network adapter (please
	specify)
	 External wireless USB keyboard and USB mouse (same brand as computer offered above)
	 Local warranty: minimum of 1 year by authorized local service provider or
	1.2 Soliwale
	 Windows TU Pro 64-bit genuine license MC Office Drefessional nerretual license (net alder then 2010 version places)
	 INS Office Professional perpetual license (not older than 2019 version, please specify)
	3yrs Antivirus License

	 1.3 24 External inch Monitor Minimum Resolution 1920x1080 (1080P / Full HD) a minimum of 1xDisplayport, 1xHDMI port, 1xVGA port Local warranty : minimum of 1 year by authorized local service provider or manufacturer 1.4 Uninterrupted Power Supply (UPS) with Minimum of 1500VA/900W LCD / LED status screen minimum of 3 backup ports Local warranty : minimum of 1 year by authorized local service provider or manufacturer 1.5 HDMI Cables 16 x 2 metres HDMI Cables
	 TV- Screen - Supply, Delivery and Installation of minimum 1x 55' inch, Smart LED TV 4K UHD Processor for conference calls and Trainings. Must include the necessary cables and wall brackets for installation on the wall.
02	 Supply, Delivery and Installation of Internet Satellite Dish, Modem and internet Connectivity for Tonoas Municipal Government Office with 1yr subscription. 1. Satellite dish for Internet connectivity (Starlink or Kacific) 2. Mounting Kit for rooftop or ground 3. All Cables (Internet & Electric) 4. Modem with Wi-Fi capabilities 5. 1 Year Subscription
03	 Supply, Delivery and Installation of Multi function Laser All in One Black & White copier/printer/scanner and 10 Toners for the Federated States of Micronesia 1. Duplex Printing 2. Gigabit Ethernet 3. Wireless 4. Dual CIS Scanner 5. NFC Card Reader 6. 10 x Toners
04	Supply, Delivery and Installation of Workstations for the Federated States of Micronesia 1. Standard workstation without bottom drawers 2. Workstation to fit two laptops on each end
05	Supply, Delivery and Installation of Double Power points/sockets for the Federated States of Micronesia 1. 18 x Standard power-points/Sockets

06	 Supply, Delivery and Installation of External/Internal Infrared Power over Ethernet IP Based PTZ Cameras with Cable for the Federated States of Micronesia 1. Infrared IP Based Cameras POE 2. Real-time, Automated Notifications 3. On-Site or Remote Video Monitoring 4. Multifaceted Analytics & Customizable Dashboards 5. 30 days Recording Software
07	 Additional Requirements and Considerations The bidder shall include the implementation plan indicating how each of the components of site assessments, goods delivery, installation, connectivity, commissioning, and end-users training will be managed during the project period. Bidder shall include operational-risk-fire-safety management plan and risk mitigation options for natural hazard events in the Pacific Region All equipment must be provided with necessary accessories such as power cable and country specific power connectors The equipment should be covered with a comprehensive "Parts & Labor" warranty for the period of not less than 12 calendar months from the date of successful Installation & commissioning User/Technical/Maintenance manuals to be supplied in English Installation must be handled by the Supplier/ Local agent. The equipment should be covered with a comprehensive "Parts & Labor" warranty for the period of not less than 12 calendar months from the period of not less than 12 calendar months from the date of successful Installation must be handled by the Supplier/ Local agent. The equipment should be covered with a comprehensive "Parts & Labor" warranty for the period of not less than 12 calendar months from the date of successful Installation must be handled by the Supplier/ Local agent. The equipment should be covered with a comprehensive "Parts & Labor" warranty for the period of not less than 12 calendar months from the date of successful Installation & commissioning. User/Technical/Maintenance manuals to be supplied in English Installation must be handled by the Supplier/ Local agent. A total Quantity of each item specified above
08	 Additional Requirements and Considerations The bidder shall include the implementation plan indicating how each of the components of site assessments, goods delivery, installation, connectivity, commissioning and end-users training will be managed during the project period. Bidder shall include operational-risk-fire-safety management plan and risk mitigation options for natural hazard events in the Pacific Region

Delive	Delivery Place and Inco terms Rules													
Lot No.	Item Description	Delivery Place	Inco terms Rules											
Lot 1	All Items	 The following installation locations in the Federated States of Micronesia Tonoas Municipal Office, Tonoas Island on Chuuk State 	DAP : Delivery at Place, UNOPS to provide tax exemption certificate											
			Lead Time: Goods should be delivered at the final location within 6-8 weeks from the contract date											

Appendix B: Additional Photos



Commute to Tonoas Every Morning & Afternoon

Digital Training & Needs Assessment Consultations



Digital Training & Needs Assessment Consultations

Digital Training & Needs Assessment Consultations



Appendix C: Star link Service in FSM



Federated States of Micronesia Telecommunication Regulation Authority P.O. Box 1919 Pohnpei FM 96941 Tel: +691 320-2812 http://www.tra.fm

May 29, 2024

Mr. Lesivou T. Bulabalavu ITU National ICT Consultant Project Coordinator Smart Island project Kolonia, Pohnpei FM 96941

Re: Starlink Service within FSM

Dear Mr. Bulabalavu,

Following your inquiry, we are pleased to inform you that the Board of Directors of the Office of Telecommunication Regulation Authority (TRA) has approved an Individual Operator's Application submitted by Starlink Pacific Islands, LLC, on March 19, 2024. Starlink is now authorized to operate telecommunication services for a duration of 20 years from the date of license issuance.

The specifics of Starlink's license can be found on TRA's website at <u>https://tra.fm/public-register-of-licences/</u>.

For subscription information, kindly visit Starlink's website at www.starlink.com.

Should you require further assistance or information, please do not hesitate to contact our office.

Sincerely,

Takuro Akinaga

Chief Executive

Appendix D: Record of Training Participants



Orienta	Siwind	* Kaela	Alfreda	Rispend	Sinrina	* Enchok	Remark	* NONO29. to	» Kilanie	" Climanta	* Magenson	* Alex	» Mrckybo	= K-Sau	* Mausenino	* EmERSon	× YKIU0	· Giveheart	" Tetwin Sunon	" Emerson	* KINDK	Jacob
Student	Student	Student	Student	Sydent	Aucleht	stutunt.	Student	Student	student	studeut	Student	Student	Student	structured	Student	Student	Stanunt	Steplent	Student	Student		Jayfihiozgmail Student
FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FAUSE	FALSE	FALSE	FALSE	FAUSE	FALSE	FALSE	FALSE

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Appendix E: Sample Survey Tool (Raw Data)

	Persor	nal Details		:	Social M	edia		Digital Acc	Lit	eracy	Others			
										Beginner/I				
							Laptop/PC	Internet	Mobile Phone	ntermediat				
No	Village	Gender	Age	FB	TikTok	Others				e/Advance	Email	CV	Disability	Electricity
1	Kuchua	Male	17	No	No	No	No	No	No	Beginner.	No	No	No	No
2	Penior	Male	14	No	No	No	No	No	No	Beginner.	No	No	No	No
3	Meseiren	Female	15	No	No	No	No	No	No	Beginner.	No	No	No	No
4	Sapun	Male	16	No	No	No	Laptop	No	1 (Mother)	Beginner	No	No	No	Yes
5	Sapun	Male	15	No	No	No	No	No	No	Beginner.	No	No	No	Yes
6	Penienuk	Female	15	Yes	Yes	No	No	Yes	Yes (Own)	Intermediate	Yes	No	No	Yes
7	Kuchua	Female	16	Yes	Yes	No	Laptop.	Yes	Yes (Own)	Intermediate	Yes	No	No	Yes
8	Pata	Female	16	No	No	No	No	No	Yes (Dad)	Beginner	No	No	Yes	Yes
9	Sapou	Female	18	Yes	Yes	No	No	Yes	Yes (Own)	Beginner	Yes	No	No	Yes
10	Nachap	Female	44	Yes	No	No	Laptop	Yes	Yes	Beginner	Not Sure	No	No	Yes
11	Nachap	Female	38	Yes	No	No	Laptop	Yes	Yes	Beginner	Yes	No	No	Yes
12	Nachap	Male	47	Yes	No	No	Laptop	Yes	Yes	Beginner	Yes	No	No	Yes
13	Nachap	Male	41	Yes	No	No	PC	Yes	Yes	Beginner	Yes	No	Yes	Yes
14	Eten	Female	22	No	No	No	No	No	No	Beginner	No	No	No	No
15	Kuchua	Female	44	Yes	Yes	No	No	Yes	Yes (Own)	Intermediate	Yes	No	No	Yes
16	Pata	Female	52	Yes	Yes	No	Laptop.	Yes	Yes (Own)	Intermediate	Yes	No	No	Yes
17	Sapou	Male	42	No	No	No	No	No	No	Beginner.	No	No	No	No
18	Nachap	Male	48	No	No	No	No	No	No	Beginner.	No	No	No	No
19	Nachap	Female	58	No	No	No	No	No	No	Beginner.	No	No	No	No
20	Wonpiepi	Male	22	Yes	Yes	No	Yes	Yes	Yes	Intermediate	Yes	No	No	Yes
21	Wonpiepi	Female	28	Yes	Yes	No	Yes	Yes	Yes	Intermediate	Yes	No	No	Yes
22	Wonpiepi	Female	25	Yes	Yes	No	Yes	Yes	Yes	Intermediate	Yes	No	No	Yes
23	Pone	Female	30	Yes	Yes	No	Yes	Yes	Yes	Intermediate	Yes	No	No	Yes
24	Pone	Male	35	No	No	No	No	No	No	Beginner.	No	No	No	No
25	Pone	Female	26	Yes	Yes	No	No	Yes	Yes	Beginner	Yes	No	No	No
26	Saponong	Male	17	No	No	No	No	No	No	Beginner.	No	No	No	No
27	Saponong	Female	18	Yes	Yes	No	Yes	Yes	Yes	Beginner	Yes	No	No	No