Sustainable Housing Needs Assessment Study
NANA Region, Alaska
“Promoting and developing healthy, safe, and sustainable housing for Northern Alaskans, without compromising the ability of future generations to meet their own needs.”
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Rural Arctic homes and communities must adapt to climate change with sustainable solutions beginning in the design phase. The current housing stock in the NANA region is extremely overstressed resulting in structural issues that are beyond remodeling and repair. This report describes the current housing needs of the homeowners in the region to bring the housing stock into the 21st century with a sustainable approach. In-home assessments were done in the villages of Noorvik, Kiana, and Deering. A total of 22 homes were visited in these villages, with many more participants wanting to participate, but unable to do so due to constraints of the project. The homes in this report range in age from 5 to 30 years old.

The purpose of this report is to define the sustainable needs of the homes, as well as the communities. To build sustainable communities, we must first build sustainable homes. Tribal leaders from each of the three villages were interviewed, as well as four community leaders from Kotzebue, and industry leaders from around the state. Since the majority of these homes were built by NWIHA, they were also contacted in order to give us a better understanding of the current housing stock situation. These interviews were done with specific questions asked of each participant. Findings from these questionnaires will follow.

The issue of overcrowding/homelessness is causing undo stress to the existing structures, which were not designed or built to sustain such over use. With improper ventilation and washing facilities, this overcrowding is causing additional issues. Inadequate storage for subsistence foods, lack of cultural elements, as well as lack of knowledge regarding building specifics and maintenance on the homeowners’ part— is resulting in poor indoor air quality, moisture and mold issues, and unhealthy living environments for the users.
First, a definition of sustainability as it applies to sustainable housing. Sustainable housing should be designed and built to provide healthy, safe, energy-efficient, and cost-effective homes that meet the needs of the user, without compromising the ability of future generations to meet their own needs. The holistic approach (spiritually, mentally, physically, and culturally) keeps the human factor the most important element in this process. The long-term effects enable us to become sustainable communities.

As an adapting culture, the Inupiat have a unique advantage. Inupiat have merged the Western foods into the subsistence diet, which makes us sustainable in that respect. By embracing Western technology and utilizing Inupiat values and knowledge, we can create an example of how to bring sustainability into rural communities all over the world.

Northwestern Alaska is experiencing warmer temperatures and thawing ground, which is causing major foundations issues in our communities. Soil-appropriate foundations set the rock in which the home sits upon. Without this, the home will eventually fall. This issue must be a high priority to ensure the new homes will endure the climate changes already occurring.

Over the years, NANA has adapted and grown to meet the needs of the Inupiat people. Housing is second to food in the hierarchy of survival, and should be the next priority in order for NANA to be more sustainable. It is imperative to adapt to meet these needs or residents in the NANA region will suffer greatly physically, mentally, spiritually, and culturally.

The first step in this process is researching the current needs of the people; the second, designing and implementing these needs; and thirdly, finding creative ways to meet these needs in a cost-effective way.
Multi-generational families living in the same home is not only an overcrowding issue, but a **homelessness** issue. When individual families do not have homes available to live in due to personal financial constraints, or simply a lack of housing availability, they are misplaced families (or homeless). This issue needs to be addressed as such or these families will continue to cause undo stress on the existing housing stock. Building bigger homes is not a solution. Designing homes that allow for multi-family living or building homes are viable solutions.

**15 out of 22 homes have overcrowding issues.** Of these 15, all were multi-generational families living in one home. All said they would love to own their own homes if the homes and financing were available.

Design and build multi-family or transitional housing, such as 4 and 6-plexes, that are suitable to multi-generational uses.
**Improper ventilation causes numerous issues, including** poor indoor air quality, mold, moisture, and rot. Without proper ventilation, a house will eventually rot away. Most homeowners who do not have proper washing facilities and hang their wet clothes indoors to dry, only add to this issue. The excess moisture has nowhere to go, thus causing mold to grow and rot to begin. This in turn causes major respiratory health issues, especially in the young and elderly. According to studies done by ANTHC, the NANA region has some of the highest upper respiratory illness in the state.

It appears that due to a lack of education regarding the importance of ventilation, homeowners do not realize what is happening to their homes, and more importantly to their health. Lack of, or improper use of HRV systems that are in place is causing major moisture issues in these homes. 15 out of 23 homes hung their laundry indoors to dry during the winter months and 19 out of 23 homes reported all windows in the homes frozen or sealed shut in the winter months. According to UAF, the ventilation issue is prevalent throughout the state. The Cold Climate Housing Research Center agrees that due to the increased efforts to create more air tight homes, the need to address ventilation is a top priority.

All but one home had either removed or turned off their HRV system and simply had a hole to the outside covered with plastic. Mold issues caused by lack of ventilation (frozen windows) and hanging of wet clothing in a bedroom. The closet wall was consumed with mold.

Design the ventilation systems to operate with very low maintenance and integrate them into the design so the homeowner does not feel like they are losing heat and gaining cold air.
Proper storage of subsistence foods is another high priority. Since this is a major aspect of our cultural needs, ensuring safe, adequate storage will not only enhance the lives of the homeowners, but provide a healthy alternative to the current situation. Most people store subsistence foods in or on boxes in the entryway of the homes, next to fuel and garbage. Cross-contamination of these items could result in a variety of health issues. Inadequate storage was an issue with all homes interviewed. Better design and space planning would solve most of these issues.

According to an ANTHC study pertaining to traditional foods, the rapid change in temperature will only worsen the problem of ill-stored subsistence foods causing health risks.

Improper storage of subsistence foods causes major health risks. Better storage design that allows for separation of fuels, foods, and garbage is a good first step.

Design and build homes that are adaptable to multi-generational uses and provide proper storage for cultural aspects, such as subsistence foods, to provide a safer, healthier home environment.
Culturally integrated homes enhance the lifestyle of the users by connecting them to their ancestral identity. A fireman would not function working in a dental office as his station. Why then not think of incorporating appropriate cultural aspects into our homes to enhance the lives of rural Alaskans?

Not one home visited displayed any sign of the Inupiaq culture. This lack of identity does not make the home environment one that is culturally appropriate. By approaching this in a holistic perspective, cultural elements integrated into the homes would provide a connection to being Inupiat. Providing appropriate space and storage of cultural items would greatly improve the sense of well being, according to various studies, such as the Human Behavior and the Interior Environment.

Studies show that a holistic home provides a safe place for rest and restoration. The home environment also affects the user’s physical, mental and spiritual well-being.

Integrate cultural aspects and elements into the design of the home.
Being a homeowner offers a sense of ownership and provides a level of responsibility that enables us, as humans, to grow and learn. But, without the proper education on how a home functions as a system, a homeowner cannot maintain and/or improve their homes. Education helps enable the homeowner to be accountable for their home.

All homeowners interviewed asked for more educational elements to help them become better homeowners. By providing a resource center or an online site to help enable homeowners to be pro-active in the improvement of their homes, NANA can structure communities to become more sustainable. The result will only benefit homeowners and will essentially create sustainable communities.

SOLUTION

Provide easy access to a resource lists and/or center for all residents. Educate homeowners in the care of their homes. Motivate residents to become pro-active homeowners.
RECOMMENDATIONS

➢ Provide climate and culturally appropriate sustainable home designs for future housing stock.

➢ Provide better space planning for existing homes and future designs.

➢ Offer educational programs on home maintenance and building systems to homeowners.

➢ Integrate cultural elements to provide a more culturally appropriate and holistic home, thus encouraging integration of Inupiat culture.

➢ Provide proper ventilation for all homes, even if it takes a creative design approach.

➢ Further study the overcrowding / homelessness issue and access the needs in this area.
“We have seen the problems that have resulted from poor design and construction in Alaska and CCHRC strives to work towards solutions. We need to develop a collaborative effort to be effective to obtain these goals together.” Judith Grunau, Architectural Designer/Project Manager, Cold Climate Housing Research Center.

“Education and collaboration of various agencies will help make these efforts more effective.” Cheryl Rosa, D.V.M. PhD, Deputy Director and Alaska Office Director, U.S. Arctic Research Commission.

“Ventilation is a serious issue in rural Alaskan homes. Education and proper ventilation will ensure a healthy environment.” Rich Seifert, PhD, UAF Cooperative Exchange, Community Sustainability Coordinator.

“Health studies show the increased upper respiratory infections and diseases in the Maniilaq region. Homes need to breathe to have clean, healthy indoor air quality.” Mike Brubaker, Director, Center for Climate and Health, ANTHC.

“Energy-efficient homes are needed to offset the high cost of fuel in rural Alaska.” Scott Waterman, Energy Specialist, AHFC

“Sustainable Rural Sanitation needs to be creatively designed to meet the needs of rural Alaskans. Extreme climate changes and access to water and roadways are difficult obstacles to overcome, yet they are being met with innovative design and application.” Bob Tsigonis, P.E./President, Lifewater Engineering Company, Fairbanks.
To adapt to climate change effects in northern Alaska, we must embrace new technologies and find ways to overcome our geographic obstacles. With high shipping costs, lack of funding, and lack of education in this area, we face a dilemma that will have major consequences on our culture and our people. The change is already occurring and our adaptation must align cohesively.

The in-home sustainable housing assessment study shows that the need is greater than we originally thought. Our timely response to this will set the course for the future. Further studies and problem solving solutions must be creatively sought out.

By shifting the perspective to be more futuristic in vision, NANA will be able to begin a shift that will enable sustainability.

In the hierarchy of survival, shelter is second only to food. It is in our best interest to view this from a holistic perspective, one that maintains balance and unity in the land and people, while adapting to the changes that are occurring.

Sustainable homes create sustainable communities, one home at a time. The needs list may seem great, but by implementing solutions to each need, we will be able to begin a cycle that will lead to more sustainable homes that are holistic and hold the human factor as the top priority. These in turn will create sustainable communities that can thrive in economic development.
TALLIED INFORMATION FROM 7 TRIBAL LEADER INTERVIEWEES:

- **Top 3 Concerns**
  - Energy Issues
  - Structural Issues/Overcrowding
  - Government Restrictions

- **Top 3 Suggestions**
  - New Construction/Energy Efficiency
  - Government Funding Allocation/Education
  - Selective Retrofitting

- **Is Overcrowding an Issue?**
  - Yes
  - No

- **Do Regional Entities Work Together?**
  - Yes
  - No

- **Top Suggestions for Better Collaboration**
  - Resource Sharing
  - Funding for Collaboration
  - Specify Duties for Each Entity
What improvements can NANA make to help?

What would make the biggest impact on your current housing situation?

Do you have concerns not mentioned?

Do you have an HRV system?

When do you open your windows?

How often do you use your laundry facilities?

Do you have laundry facilities?

What changes could help the elderly and disabled?

Is anyone disabled or elderly?

Does your home meet your subsistence needs?

Do you subsistence hunt?

How could you improve representing your Inupiat values?

Does your home represent your Inupiat values?

How do you heat your home?

Would you like to own your own home?

How do you feel about being a homeowner?

Do you own your own home?

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