ON THE FOOD SOVEREIGNTY PATH:
ESTABLISHING A HYBRID FOR-PROFIT/NONPROFIT AGRICULTURAL COOPERATIVE ON THE NAVAJO NATION TO IMPROVE EARLY CHILDHOOD NUTRITION

by
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Abstract

Theory: Food insecurity continues to proliferate on the Navajo Nation. To combat this, it is critical that more indigenous farmers find innovative ways to navigate systemic structural challenges and increase agricultural production. Toward this end, this study examines the organizational strategies, economic opportunities, potential for growth and key results of establishing on the Navajo Nation an agricultural cooperative that combines for-profit and nonprofit entities, under a so-called "hybrid model," to improve nutrition and population health outcomes in early childhood (0-5 years) and beyond.

Methods: This study uses the Johns Hopkins University "Workplace Challenge" dissertation framework, consisting of an organizational assessment, economic evaluation, plan for new service/program and discussion of implications. I apply it to two entities: Bidii Baby Foods (BBF), a for-profit Limited Liability Corporation (LLC) and the first agricultural cooperative registered domestically on the Navajo Nation; and the BEN Initiative, a not-for-profit corporation registered in the State of New Mexico and recognized as tax-exempt under section 501(c)(3) of the Internal Revenue Service (IRS) Code. For the organizational assessment I use the *Balanced Scorecard* strategic planning and management tool to develop and apply key indicators to Fiscal Year 2022 (FY22) performance data. Using a *Social Return on Investment* (SROI) analysis, I conduct an economic evaluation and score the social impact of the hybrid model on the healthcare costs associated with treating childhood overweight and obesity. In the *Plan for New Program* component, I combine a literature review, conceptual framework and implementation planning to identify best practices in developing a successful “farmer incubator” training/mentoring program.

Results: The Balanced Scorecard assessment of the BBF/BEN Initiative hybrid model focuses on four domains using FY22 data: Financial, Customer, Learning & Growth and Internal Business. I analyzed each and identified six areas for improvement. I calculated the running costs of a scaled-up five-year program designed to meet the nutritional demands of Navajo Nation children aged 0-5 years and found the hybrid model achieved a 3:1 SROI.

Conclusion: The BBF/BEN Initiative hybrid provides a unique and effective business model for increasing food sovereignty and improving early childhood nutrition on the Navajo Nation.

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Reflexivity Statement

I write from the perspective of a settler doctoral student. I am a Hungarian-American woman, currently residing in Gallup, New Mexico with my husband (Diné) and children. My husband and I have a sixteen-acre farm in Gadii'ahi, Navajo Nation, where we grow a variety of produce from indigenous heritage seeds (corn, squash, melons, beans and amaranth). Together we co-founded Bidii Baby Foods (BBF) in 2021, a domestically registered agricultural cooperative on the Navajo Nation that grows fresh produce and manufactures traditional Navajo corn-based baby food products. We initially started this company out of our own need and desire to feed our child locally grown and indigenous produce as his first foods after breastmilk. We quickly saw interest in our products expand among family, friends and community. This motivated us to combine our agricultural skills with public health practice and entrepreneurship to create a cooperative that would address the severe food insecurity and nutrition-related chronic health conditions faced by young children in our community.

As a White, cisgendered woman, I navigate life with significant power and privilege. I believe that the power and privilege I hold have opened certain doors and pathways to success that other businesses and organizations operating in our community, on Tribal lands, do not equitably have access to. These systemic racial inequities are what limit native-owned businesses and organizations, which I aim to bring to light in this dissertation. The target audience for this research includes agriculturalists, entrepreneurs, researchers and public health professionals who currently work in, or aim to ally with, Indigenous communities and who seek to improve food access. In this doctoral dissertation, I reflect on the organizational development and economic growth of BBF and the BEN Initiative. I also develop an implementation plan for a new program and share a work plan for FY23-FY26. In these analyses, I utilize both western and indigenous epistemologies that I have had the privilege and humbling opportunity of learning through academic training, mentorship and partnership with community and family.

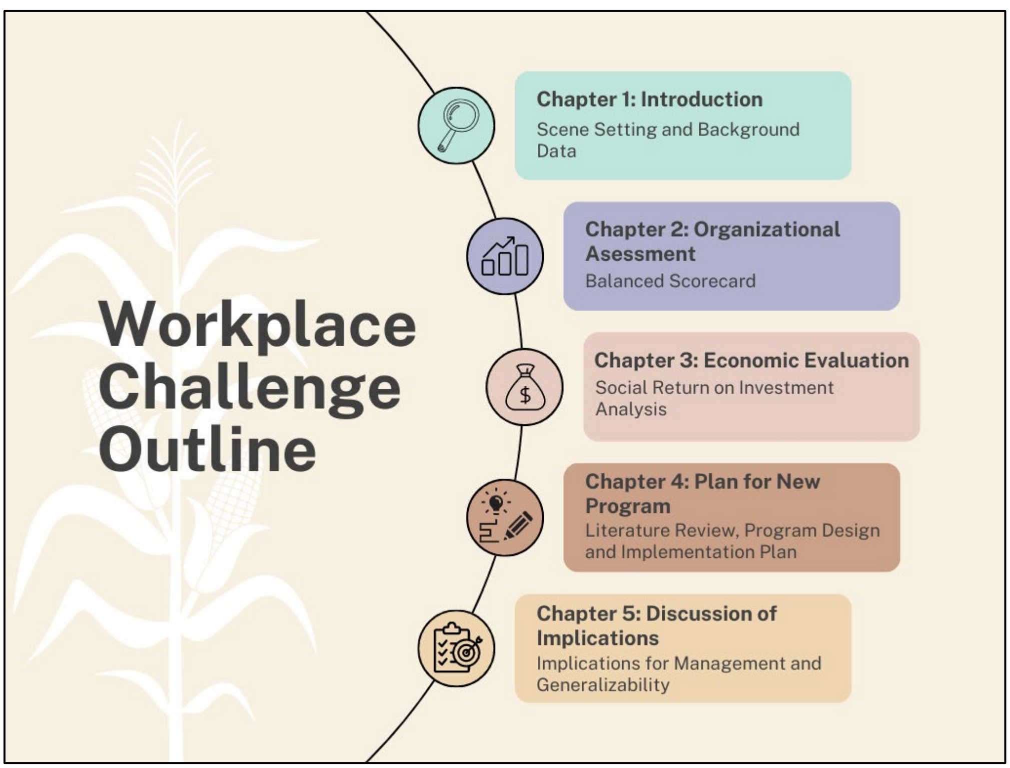
Executive Summary

The Workplace Challenge dissertation format requires the selection of one organization or a combination of several organizations to complete a series of three out of four practice-based analytical projects (organizational assessment, plan for a new program or service, program evaluation or economic evaluation). Consistent with this requirement, this dissertation consists of several components which, when combined, provide a deeper understanding of one agricultural cooperative's approach to addressing childhood food insecurity on the Navajo Nation. I strived in the course of writing it to apply and leverage skills I gained from my participation in the Doctor of Public Health (DrPH) - Health Equity and Social Justice (HESJ) program at the Johns Hopkins University Bloomberg School of Public Health. These skills were particularly useful to me in the conception, development and implementation of Bidii Baby Foods (BBF), an agricultural cooperative and family farm located in Gadii'ahi, Navajo Nation, and the BEN Initiative, a tax-exempt organization serving as a fiscal sponsor to BBF . My goal in this study is to conduct an organizational assessment, economic evaluation and plan for a new program for the "hybrid" for-profit/nonprofit model of BBF and the BEN Initiative (Figure 1). I discuss the implications of this analysis in the final chapter and use them to establish a work plan for the hybrid organization.

Chapter 1 sets the scene for my use of the Workplace Challenge dissertation framework by providing background data on Navajo Nation population health indicators and outcomes, as well as historical data on the food landscape and agricultural practices on the Navajo Nation. I highlight the need for increased agricultural production and accessibility to locally grown and traditional foods in early childhood. Chapter 2 introduces Bidii Bady Foods (BBF) and the BEN Initiative as a hybrid for-profit/nonprofit model working together with the goal of increasing food sovereignty and greater access on the Navajo Nation to traditional foods in early childhood (0-5 years) and beyond. I use the Balanced Scorecard strategic management tool to determine organizational outputs across four primary areas: Financial, Customer, Learning & Growth and Internal Operations. In Chapter 3, I conduct a Social Return on Investment (SROI) analysis to determine the positive social impact on childhood overweight and obesity related illness and costs that could result from additional, targeted investment and scale up of BBF agricultural production.

Figure 1

Workplace Challenge Dissertation Outline



Recognizing the need to build internal capacity within the hybrid agricultural cooperative, I outline in Chapter 4 a plan for a farmer incubator training/mentoring program which I call "Farmer-in-REZidence." I conduct a literature review to identify best practices and common barriers to such programs, followed by program design and implementation planning specifically crafted to reflect BBF/BEN Initiative's current structure and established goal of addressing the nutritional needs of Navajo children five and under.

In the final chapter, Chapter 5, I discuss the strengths and limitations of the Workplace Challenge framework, as well as the essential role leadership plays in addressing organizational challenges and impacts on management. I consider local, Tribal and state policy implications. I also discuss the generalizability of my findings to other tribal communities and agricultural cooperatives. Lastly, I identify organizational resources available to BBF/BEN Initiative to achieve its increased program objectives and highlight gaps in those resources.

Chapter 1: Introduction

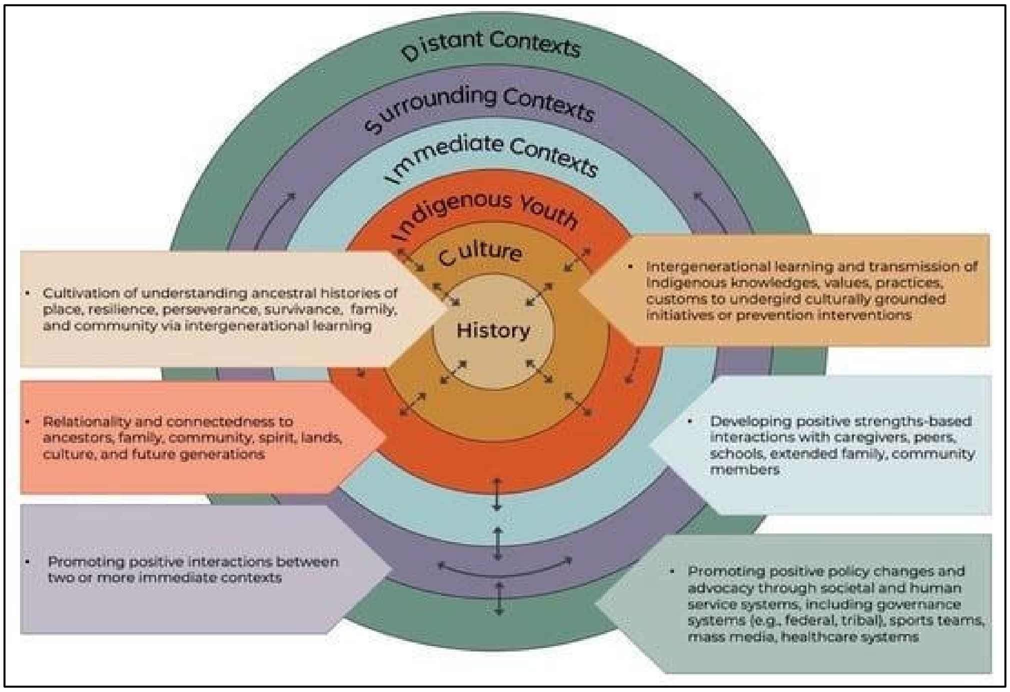
1.1 Indigenist Ecological Systems Model

I believe the empirical evidence is clear and unequivocal: there is a strong association between, on one hand, the decline in agricultural production and food sovereignty among indigenous communities like the Navajo Nation and, on the other hand, the increase in negative health outcomes of its population. There is an extensive body of dominant-culture population health research supporting this view. But I believe evidence of this association is also found within the *Indigenist Ecological Systems Model*, a social-ecological framework used to illustrate the connection between individuals and the proximal and distal environments around them (Figure 2).

This framework conceptualizes the order and meaning of surrounding environments to account for the influence of history and cultural contexts on the developmental beginnings and outcomes of indigenous peoples (O'Keefe et al., 2022). Grounding indigenous development and present-day challenges within a people's history and culture provides a baseline of interconnectedness and relationality, which are the cornerstone of indigenous epistemology. This framework has been applied to Indigenous student experiences in higher education, as well as mental health intervention. However, findings from these framework applications suggest that Indigenous people experience the best outcomes when they are able to access and connect to their histories and cultures in their environments, compared to less desirable outcomes when their environments are prohibitive to accessing histories and culture (O'Keefe et al., 2022).

Figure 2

Indigenist Ecological Systems Model[1]



Federal and Tribal policy, governance, environment, economics and other social determinants of health have all contributed to the decline in agricultural production and consumption of locally grown and traditional foods. The Indigenous Ecological Systems Framework proposes strengths-based interventions to support each system's level. It is recommended that Indigenous peoples understand ancestral histories related to place, resilience, family and community connectedness, which are often provided (when undisrupted) through oral storytelling and intergenerational learning. This transmission

[1] O'Keefe, V. M., Fish, J., Maudrie, T. L., Hunter, A. M., Tai Rakena, H. G., Ullrich, J. S., Clifford, C., Crawford, A., Brockie, T., Walls, M., Haroz, E. E., Cwik, M., Whitesell, N. R., & Barlow, A. (2022). Centering Indigenous Knowledges and Worldviews: Applying the Indigenist Ecological Systems Model to Youth Mental Health and Wellness Research and Programs. *International Journal of Environmental Research and Public Health*, *19*(10), Article 10, Figure 2. https://doi.org/10.3390/ijerph19106271

of indigenous knowledge, values, practices and customs are essential for the development of successful interventions within Indigenous communities.

Relationality and connectedness to histories and culture, among youth in particular, are essential to preventing many of the health disparities we see in Indigenous communities today. Within the immediate environment of indigenous peoples, there must be positive, strengths-based interactions among family/caregivers, peers, schools and community. Within surrounding and distal environments, policy and advocacy must provide positive impacts and accessible human service systems that are protective of Indigenous communities.

In its examination of an indigenous hybrid for-profit/nonprofit agricultural cooperative, this study is rooted in the Indigenous Ecological Systems Model framework. It does so as the means by which to situate strengths-based approaches as it addresses large, systems level challenges impacting food access in early childhood on the Navajo Nation. This framework guides the study's theory of change wherein history, culture, families, schools, community, larger systems and environments must all be engaged within indigenous communities in order to improve food accessibility and achieve food sovereignty in early childhood. Findings from this study can provide guidance to other Indigenous farmers on the Navajo Nation, as well as others in indigenous communities seeking to address their long-term negative health outcomes through the development of agricultural businesses focused on improving early childhood nutrition.

1.2 *Achieving Indigenous Food Sovereignty*

While the legacy of indigenous ownership of their own foodways dates back centuries, the current concept and terminology of "food sovereignty" is generally acknowledged to have been developed by the indigenous rights non-governmental organization (NGO) *La Via Campesina* ("the peasants' way") in the 1990's and introduced into the public lexicon by them during their advocacy around the 1996 United Nations Food and Agriculture Organization (FAO) World Food Summit in Rome. La Via Campesina defines food sovereignty as "the peoples', Countries' or State Unions' RIGHT to define their agricultural and food policy…," a right they believe includes, among other elements,

> the right of farmers, peasants to produce food and the right of consumers to be able to decide what they consume, and how and by whom it is produced…and the prioritizing [of] local agricultural production in order to feed the people, access of peasants and landless people to land, water, seeds, and credit. (La Via Campesina, 2003, emphasis in original)

Others have defined food sovereignty as "the right to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems" (Abdul et al., 2023). The U.S. Office of Indian Economic Development, while conceding that no "universal definition" of food sovereignty exists, believes it encompasses

> [t]he ability of communities to determine the quantity and quality of the food that they consume by controlling how their food is produced and distributed.

> Food sovereignty initiatives like farm-to-table and farm-to-school programs are important for the long-term health, economic stability, and cultural preservation of American Indian and Alaska Native (AI/AN) communities. (U.S. Department of the Interior, 2023)

Internationally, the United Nations Food and Agriculture Organization (FAO) maintains that food sovereignty can only exist when both food security and nutrition are achieved. In its words, "food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (United Nations Food and Agriculture Organization, 2019, p. 186).

1.3 Population Health of the Navajo Nation

The Navajo Nation is a Federally recognized Tribal Nation located in the Four Corners region of the Southwest United States. Roughly the size of West Virginia, it spans 22,537 square miles across all or parts of thirteen counties in three states: Arizona, New Mexico and Utah.[2] It has 399,494 enrolled tribal members (Becenti, 2021), with 143,435 of them residing within Reservation and Off-Reservation Trust lands (U.S. Census Bureau, 2021a).[3] Of the total households living on these lands (n=38,337), 28.1%

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[2] This geographic sprawl presents challenges for the identification, collection, analysis and interpretation of population health data, as available data are frequently aggregated at standard non-Tribal administrative boundaries, e.g., U.S. states and counties, which often do not align well with Tribal and Trust lands.

[3] The U.S. Census Bureau defines *American Indian reservation* as "[a]reas that have been set aside by the United States for the use of tribes, the exterior boundaries of which are more particularly defined in final tribal treaties, agreements, executive orders, federal statutes, secretarial orders, or judicial determination. See https://www.census.gov/glossary/?term=American+Indian+reservation+-+federal. *Off-Reservation Trust lands* are defined as "[a]reas for which the United States holds titles in trust for the

(n=10,799) have children five years of age or younger living in the household (U.S. Census Bureau, 2021b).

The median household income on the Navajo Nation is $30,759, roughly half the national figure of $69,021 (U.S. Census Bureau 2021a). Two of ten Navajo Nation households (20.9%, n=8,753) earn less than $10,000 annually (U.S. Census, 2021c). Thirty-six percent (36.5%, n=51,995) of the population have incomes below the poverty level, almost triple the overall rate in the United States (12.6%), while approximately twelve percent (12.4% (n=17,656) of children on the Navajo Nation live in poverty (U.S. Census Bureau, 2021d). Just over four of ten (43.7%, n=47,883) residents are in the civilian labor force; of these, 6.2% (n=6,803) are unemployed (U.S. Census Bureau, 2021e). Around seventy percent (72.4%, n=40,898) of housing units are detached, while two of ten (21.6%, n=12,199) are mobile homes (U.S. Census Bureau, 2021f).

Significant numbers of families on the Navajo Nation lack access to even basic utilities and services. Thirty-two percent lack electricity, 31% lack complete plumbing, and 30% lack piped-in water. Cooking capacities are also limited, with 28% of families lacking kitchen facilities and almost nine of ten (86%) have no natural gas service for either cooking or heating (Navajo Tribal Utility Authority (NTUA), 2021).[4]

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benefit of a tribe (tribal trust land) or for an individual American Indian (individual trust land). See https://www.census.gov/glossary/?term=American+Indian+off-reservation+trust+land.

[4] The costs involved in closing the gap in access to basic services on the Navajo Nation are enormous. For example, according to a 2021 study by the Navajo Tribal Utility Authority, NTUA, the average cost to connect one family to the electrical grid is $40,000; an estimated 14,063 homes need connection, at an estimated cost of $563 million. The NTUA places the total cost of meeting the utility needs of all homes on the Navajo Nation (including electricity, natural gas, water, wastewater, cellular and Internet) at $5.2 billion (Navajo Tribal Utility Authority, 2021). By way of comparison, the FY2023 Navajo Nation entire operating budget was just over $2.5 billion.

According to the Indian Health Service (IHS) (2019), the Federal Health Program for American Indian and Alaska Native (AI/AN) populations, positive indigenous population health outcomes lag those of non-indigenous communities. Chronic illnesses, including diseases of the heart, diabetes, cancer and unintended injuries, are the leading causes of death in AI/AN populations. AI/AN also die of other causes, including cirrhosis, assault/homicide, intentional self-harm/suicide and chronic respiratory disease at rates higher than other populations. Chronic illnesses like diabetes and cardiovascular diseases are primary sources of morbidity and mortality.

In a recent (2021) policy statement, entitled "Caring for American Indian and Alaska Native Children and Adolescents," the American Academy of Pediatrics (AAP) highlighted some of the challenges American Indian/Alaska Native (AI/AN) children face as they navigate a population health landscape of health disparities and negative outcomes, noting that AI/AN children "have a higher prevalence of chronic stress and adverse childhood experiences (ACEs) and exposure to environmental hazards resulting in poorer health outcomes when compared with the general population (Bell et al., 2021).

Research by the Robert Wood Johnson Foundation's *State of Childhood Obesity* project found the prevalence of obesity among all youth nationally aged 10-17 years to be 17%, versus 20.5% among AI/AN youth in this age cohort (Robert Wood Johnson Foundation, 2023a). They also found that the prevalence of obesity among children aged 2-4 years enrolled in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) program actually decreased over the period of 2010-2020, from 15.9% to 14.4%. While they found this decline to be statistically significant across all races and ethnic groups, the rate among AI/AN 2–4-year-old children (18.4%) still exceeded both the national rate (14.4%) and the rate in Asian/Pacific Islander (10.7%), Black (11.9%), Hispanic (17.4%), and White (12.3%) communities among WIC-enrollees in this age cohort (Robert Wood Johnson Foundation, 2023b). On the Navajo Nation itself, 50% of children experience being overweight or obese (Community Outreach and Patient Empowerment (COPE), 2016).

American Indian and Alaska Native communities also suffer negative maternal and child health outcomes at a rate greater than non-AI/AN groups. According to the Centers for Disease Control and Prevention (CDC), the infant mortality rate in the United States (2020) was 5.4 deaths per 1,000 live births. The corresponding rate for the AI/AN community was 7.9 (Centers for Disease Control and Prevention, 2022). Median U.S. state maternal mortality rates (MMR) for AI/AN populations were found to have had the largest increase among all races and ethnicities over the period 1999-2019, going from 14.0 to 49.2 deaths per 100,000 live births (Fleszar et al., 2023). Access to first trimester prenatal care is lower for AI/AN women (63.7%) than White women (82.8%) and 13.0% of AI/AN mothers received late or no prenatal care compared to 4.5% of White mothers (U.S. Department of Health and Human Services, 2021). Meanwhile, Navajo Nation mothers initiate breastfeeding at a rate (60.8%) lower than both AI/AN mothers in general (76.6%) and overall (84.1%) among mothers nationally (Navajo Department of Health, 2016; Chiang, 2021).

These health disparities impose significant costs on the AI/AN health care system. A 2012 study on health care costs related to diabetes treatment within the Indian Health Service (IHS) published in the *American Journal of Public Health* found that

> IHS treatment costs for the 10.9% of American Indian adults with diabetes accounted for 37.0% of all adult treatment costs. Persons with diabetes accounted for nearly half of all [IHS] hospital days (excluding days for obstetrical care). Hospital inpatient service costs for those with diabetes accounted for 32.2% of all [IHS] costs. (O'Connell et al., 2012, p.301)

Another study placed the estimated yearly cost to treat AI/AN overweight and obesity related health issues in childhood at $274 per-capita (Ling et al, 2023).

1.4 Food Landscape of the Navajo Nation

Anthropologists theorize the arrival of the Navajo on the North American continent at some point between 800 and 1,000 years ago, via the Bering Strait land bridge. Calling themselves *Diné* ("The People"), their traditional homeland (*Diné Bikéyah*) encompassed an area within four sacred mountains in the Southwest United States spanning the modern-day states of Colorado, New Mexico, and Arizona known as the "Four Corners" (Smithsonian, 2019). One version of their emergence story speaks of corn, squash, beans, and tobacco as gifts from the Diyin Dine'é (Holy People), which together formed the basis of their diet. Another speaks of the Diné (Navajo) as having emerged literally from corn, with the knowledge that all that they might need to live long and healthy lives could be found within the boundaries of the four sacred mountains of the *Diné Bikéyah*. The arrival of the Spanish in the sixteenth century introduced more variety to the Diné diet, including additional cultivated crops such as peaches, apples, melons, and wheat. The Spanish also introduced an assortment of livestock, including horses, cattle, goats and, most significantly, Churro sheep, which the Diné would adopt and make their own over the coming centuries. The introduction of livestock into Diné foodways represented both a dietary shift as well as an economic one, in the form of their new-found role as herders (Diné Policy Institute, 2014).

Over the centuries, both the Spanish and later the Mexicans tried unsuccessfully to subjugate the Diné or force them to abandon their indigenous foodways. In its history of Navajo food sovereignty, the Diné Policy Institute (2014) noted that

> [w]hile the Spanish and Mexican influence to the Diné Diet is significant, it is important to note that Diné people still actively managed their food system by continuing to produce their own food during this time period. This, of course, would change when the next major shift in the Diné Diet came with the arrival of the Americans into Diné territory some 200 years after the Spanish." (p.44)

This "arrival of the Americans" proved the undoing of the Diné's/Navajo efforts to maintain their own food system. Driven in the 1800's by the doctrine of "Manifest Destiny" -- the belief that "white Americans had a divinely sanctioned right to claim lands not only claimed by Mexico but also inhabited by Native peoples" -- the United States pushed out into the American West (Diné Policy Institute, 2014, p.44). The subsequent Mexican-American War (1846) resulted in the Treaty of Guadalupe Hidalgo (1848), the terms of which gave the U.S. title to large swatches of lands in the Southwest and California, much of them indigenous, including those of the Navajo.

Conflict between the Navajo and the U.S. military ensued, culminating in the launching of a military expedition in 1863-1864 targeting them for removal from their existing homeland to open it up to White settlers (Diné Policy Institute, 2014, p.45).

On 15 June 1863, U.S. Army General James Carelton issued General Order 15, directing Colonel Christopher ("Kit") Carson to "prosecute a vigorous war against the men of [the Navajo] tribe" (as cited in Kelly, 1970, p.22). Kelly, in his work *Navajo Roundup*, uses selections of Carson's field reports to Carleton (housed in the collections of the National Archives) to tell the story of the Navajo relocation. Among them are communications that provide a glimpse of what historians have come to describe as Carson's "scorched earth policy." For example, on 2 January 1864, well into the first winter of his expedition against the Navajo peoples, Carson reported to Carelton

> I have now twenty Seven [Navajo] captives. […] Judging from the appearance of these captives, the generality of the Navajos are completely destitute. They are almost completely naked, and…they must have been without any description of food this year. *This is owing to the destruction of their grain amounting to about two Millions of Pounds by my command on its first arrival in this country, and which [the Navajo] depended on for their Winter's Sustenance*. (as cited in Kelly, 1970, pp.92-93, emphasis added)

By late 1864, Carson's combined "scorched earth" tactics of confiscating or destroying crops, destroying water wells and killing livestock achieved their goal: the surrender and relocation of the Navajo. As the Diné Policy Institute (2014) explained

> [The] scorched earth policy effectively starved many Diné people into surrender. Word reached those who had not been captured that food was being distributed at Fort Defiance. Many families chose to go to the fort to alleviate their hunger and discuss peace, unaware of Carleton's plans for relocation. Upon arrival at the fort, the Diné found they could not return back to their homes and were captives of the United States military. (p.45)

Beginning in the fall of 1864 and into the next year, Carson began the forced march of the Navajo to the area known as *Bosque Redondo*, in the vicinity of Fort Sumner, New Mexico, approximately 300 miles east of their ancestral homelands. Known to the Navajo as "The Long Walk," some 8,000 Navajo ended up making the journey, with many dying along the way or over the following four years in Bosque Redondo. Their time there caused a significant change in the foodways of the Navajo:

> The soil at Bosque Redondo was high in alkali content, and due to crop failure year after year, Bosque Redondo was unable to sustain the nearly ten thousand Navajos now living there. [General] Carleton [Carson's commanding officer] had selected the site despite criticism that it would be inadequate to provide for the people, as he also underestimated the number of Navajos that would be interned there. {…] Due to failure of crops, restrictions on hunting, and the unavailability of familiar native plants, the Diné had to depend on the United States military to feed them, marking a major turning point in the history of Diné food and self-sufficiency. Food rations were inadequate and extremely poor in

> nutritional content, consisting primarily of salted pork, cattle, flour, salt, sugar, coffee and lard. (Diné Policy Institute, 2014, p.46)

In an effort to stop the warfare between the two, and establish a permanent home for the Navajo, the United States and the Navajo entered into the Treaty of 1868.[5] returning the tribe to its ancestral lands between the four sacred mountains ("Four Corners") which now constitute much of the modern-day Navajo Nation.

According to culinary anthropologist Lois Ellen Frank, prior to colonization, the Navajo diet was both cultivated and foraged; in this it was similar to other Southwest indigenous peoples:

> Seeds, nuts and corn were ground into flour using grinding stones and made into breads, mush and other uses. Many Native cultures harvested corn, beans, chile, squash, wild fruits and herbs, wild greens, nuts and meats. Those foods that could be dried were stored for later use throughout the year. As much as 90 percent of the Southwestern Pueblo diet consisted of calories consumed from agricultural products, with wild fruits, greens, nuts and small game making up the balance. Because large game was scarce in some areas, textiles and corn were traded with the Plains people for bison meat. (Frank, 2021)

Traditional Navajo foodways were severely disrupted by the deliberate destruction of crops and livestock by the U.S. military in the round ups; the subsequent forced

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[5] Also known as the *Treaty Between the United States of America and the Navajo Tribe of Indians* or, in the National Archives citation, "Ratified Indian Treaty 372, Navaho (Navajo)," it entered into force on 12 August 1868. Among other things, it provided for the cessation of war between the two parties and allocated to the Navajo the land comprising the current Navajo Nation. See https://catalog.archives.gov/id/6172856

migration of the Long Walk to Fort Sumner during the period 1864-66; and the four-year internment at Bosque Redondo preceding the Treaty of 1868. Over this period the United States government distributed rations to the Navajo, including items like sugar, canned meats ("spam"), lard, flour and coffee. Frank (2021) explains that, although intended to serve as a temporary "interim solution" until the Navajo could begin cultivating and producing their own food, many Navajo became dependent on this Government food ration, at the expense of their own indigenous foodways. It was, Frank said, "one of the most dramatic dietary changes in Native American history."

Moving into the 20th century, the influence of these changes on Native American nutrition, and the corresponding impact on adult and early childhood health, began to emerge. Among the findings and recommendations of a 1928 Indian Affairs survey conducted at the request of the U.S. Secretary of the Interior are found these observations:

> [t]he prevailing living conditions among the great majority of the Indians are conducive to the development and spread of disease. With comparatively few exceptions the diet of the Indians is bad. It is generally insufficient in quantity, lacking in variety, and poorly prepared. The two great preventive elements in diet, milk, and fruits and green vegetables, are notably absent. Most tribes use fruits and vegetables in season, but even then the supply is ordinarily insufficient. The use of milk is rare, and it is generally not available even for infants. Babies, when weaned, are ordinarily put on substantially the same diet

> as older children and adults, a diet consisting mainly of meats and starches. (Research, 1928, pp. 3-4)

Nevertheless, the Navajo fought to keep their traditional foodways alive. A 1941 *Journal of American Dietetic Association* article highlighted the wide diversity of the traditional Navajo diet then prevalent on the reservation, based on surveys conducted on the Navajo Nation between 1934-1936 (Appendix A). As for today and the future, the Diné Policy Institute (2014), in their examination of Navajo food sovereignty, offered this insight:

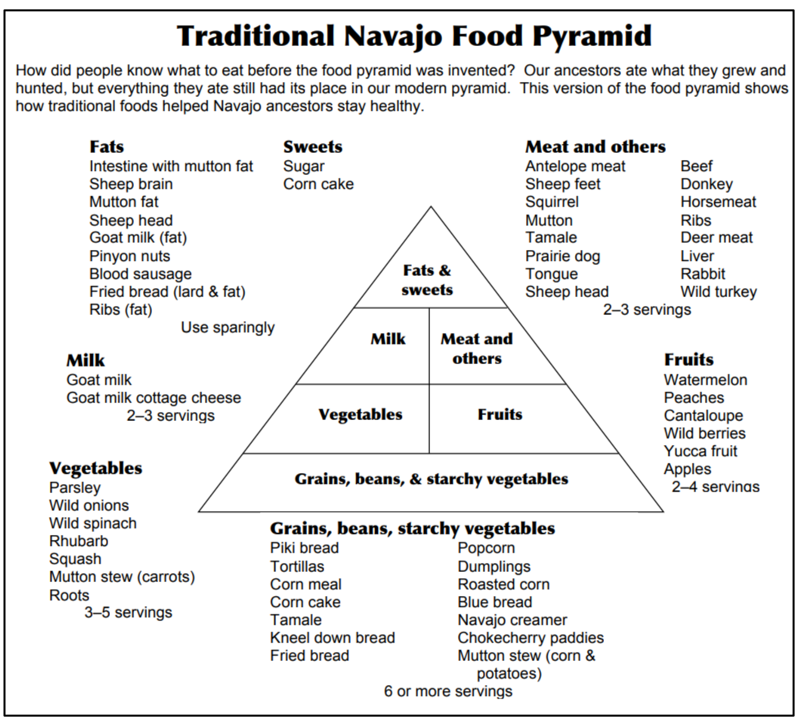
> The general trend…is the decline of indigenous Diné foods and the increase of non-native and highly processed, high calorie foods in the Dine Diet. This decline has been so substantial that in the contemporary Navajo Diet, the only “traditional” foods consumed on a daily basis are tortillas and/or fry-bread, which only became part of the Diné Diet with the forced removal to Fort Sumner. Even sheep, the symbol of Navajo culture for the past century are facing considerable decline in the Navajo Diet in the 21st century. In addition to dietary changes, the shift in Diné life and society also include the breakdown of self-sufficiency, Diné knowledge, family and community, and detachment from land. These changes did not occur by chance,but were fostered by a series of American interventions and policies (the process of colonization); namely forced removal, the livestock reduction, boarding schools, relocation, and food distribution programs, along with the change from subsistence lifestyles to wage based society and integration into American capitalism. (p. 51)

Evidence tying the introduction of non-native foods -- especially items that mirror the nutritional composition of the Government ration of yesterday and USDA surplus food commodities of today -- to the increased prevalence of, among other chronic diseases, cardiovascular disease and diabetes continues to mount (Dillinger et al., 1999; Siegel et al., 2016).

This connection between food and health has spurred renewed efforts to revisit and revitalize connections between traditional indigenous foodways and current Navajo approaches to food and nutrition. Working in partnership with the Navajo Nation Museum and New Mexico State University, the Navajo Nation's Chinle Unified School

Figure 3

Traditional Navajo Food Pyramid[6]



[6] Chinle Unified School District #24, "Traditional Navajo Food Pyramid." https://www.chinleusd.k12.az.us/pdf/Curriculum/Fourth%20Grade/Navajo-food_pyramid.pdf

District developed a “Traditional Navajo Food Pyramid” focused on ancestral foods (Figure 3). The majority of food items listed are pre-contact foods that were once cultivated or foraged on Tribal lands.

In an effort to repurpose existing and well-known nutrition education tools in support of indigenous communities, the Indian Health Service (IHS) developed a version of the USDA’s “My Plate” nutrition healthy eating education chart (Figure 4). Titled “My Native Plate," the chart depicts general portion dietary guidelines for Fruits, Vegetables, Proteins, Grains/Starches and Water. Additional detailed suggestions within each of the nutritional

Figure 4

My Native Plate[7]

[7] Indian Health Service, “My Native Plate.” https://www.ihs.gov/diabetes/education-materials-and-resources/diabetes-topics/nutrition/my-native-plate/

categories are found on the IHS website, along with supplemental nutrition education information provided on the United States Department of Agriculture (USDA) website, particularly its section on the Special Supplemental Nutrition Program for and Women, Infant and Children (WIC).[8]

The Navajo Nation has also attempted, through tax-based public policy initiatives, to disincentivize the purchase of unhealthy foods while incentivizing that of healthy choices. It enacted the *Healthy Diné Nation Act of 2014* (HDNA), and in doing so became the first Tribal nation to institute a so-called "junk food" tax (Healthy Diné Nation Act of 2014). The original (2014) version of the HDNA levied a 2% sales tax on the purchase of what it called "minimal-to-no nutritional value food items" (§1003(A)). These were defined as food items falling into fairly broad categories, including "Frozen Desserts," "Sweetened Beverages, "Candy," "Pastries," and "Snack Chips and Crisps." In an effort to provide an economic incentive for the purchase of healthy foods, legislation was also enacted alongside the HDNA that exempted fresh fruit and fresh vegetables from the general sales tax of 2%-5% (Sales Tax, 2020, §605(A), as amended).

Gross revenues from the HDNA (less 5% retained to cover the costs of administering it) were to be deposited into the "Community Wellness Development Projects Fund" (§1020(A)). Chapters[9] would receive allocations from the tax revenue to

[8] See Indian Health Service (HIS). "Nutrition." https://www.ihs.gov/Nutrition/; US Department of Agriculture (USDA), "Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)." *Food and Nutrition Service*. https://www.fns.usda.gov/wic

[9] Navajo Nation governance is geographically subdivided into one hundred and ten semi-autonomous administrative units called "chapters." These are roughly equivalent to counties. They range in population from a high of 9,126 individuals (Shiprock) to a low of 76 (White Rock). See https://navajochapters.org/

fund “Community Wellness Projects,” defined in the HDNA as “Navajo Nation Chapter, community-based, community-owned wellness projects to address improvement to the physical and social environment of the community because of the need to prevent and/or reduce the incidence of obesity and Type 2 Diabetes Mellitus” (§1007(A)). Among the statutorily approved projects were “farming and vegetable gardens,” “farmers’ markets,” and “health convenience stores.”

The HDNA was amended in 2020 to bring more clarity to what types of foods it intended to include. It retained the 2% tax but changed the description of food items subject to the tax from “minimal-to-no nutritional value food items” to “Unhealthy Foods and Beverages.” This was promoted, in the words of the Navajo Tax Commission, by its finding that “certain provisions of the [2014] Act are unclear, such as the definition of ‘Minimal-to-no nutritional value food items’…which has created challenges for the Office of the Navajo Tax Commission to effectively administer and enforce the Act” (Healthy Diné Nation Act of 2014, 2020, as amended).

Studies conducted to evaluate the impact of the HDNA on healthy food choices have identified several resulting improvements at the retail level, including increased healthy food signage, as well as increased displays of healthy food items, food items offered, and pricing. One study examining the effects of the HDNA found that 71% of stores surveyed offered at least three fruit varieties, and 65% of stores had three or more vegetables for sale (George et al., 2021a). Compliance with the HDNA itself by retailers, though encouraging, has been uneven. In one study conducted in 2019, almost nine out of ten Navajo Nation retail outlets (87.2%, n=47) were found to accurately apply the 2% sales tax on unhealthy items. However, only a little over half (55.3%) accurately applied the general sales tax exemption to healthy food purchases. Overall, only half of the retail outlets surveyed (51.1%) accurately applied both the tax and tax exemption (George et al., 2021b).

In terms of the demand for unhealthy food items, there is evidence to suggest the HDNA tax is having a positive impact on reducing the quantity of unhealthy food being purchased. Yazzie et al. (2020) looked at tax revenue data for the period 2015-2019 provided by the Office of the Navajo Tax Commission. They found that over that period, the 2% tax generated $7.58 million in revenue. Revenue declined steadily -- indicating fewer unhealthy food items subject to the tax were being purchased -- from the 4th quarter 2015 through the 4th quarter 2019 at the rate of 3.2% in 2017, another 1.2% in 2018, and another 4.6% in 2019. Adjusted for inflation, this represented an average per-year reduction of 4.1%, a “significant downward trend,” in the words of the researchers (p. 3). In conclusion, they stated:

> [we] found some evidence of a downward trend in HDNA tax revenue, without declines in retail-related sales tax revenue. Perhaps the combination of the tax itself, a population with high poverty rates, and the funding of local wellness projects with the tax revenue might have increased awareness of the policy and healthy eating, resulting in modest reductions in purchasing behaviors. (p. 3)

This study preceded the 2020 amendment of the HDNA which provided more clarity and specificity to the identification of what types of foods were subject to the tax. The impact of that change on purchasing habits has yet to be examined.

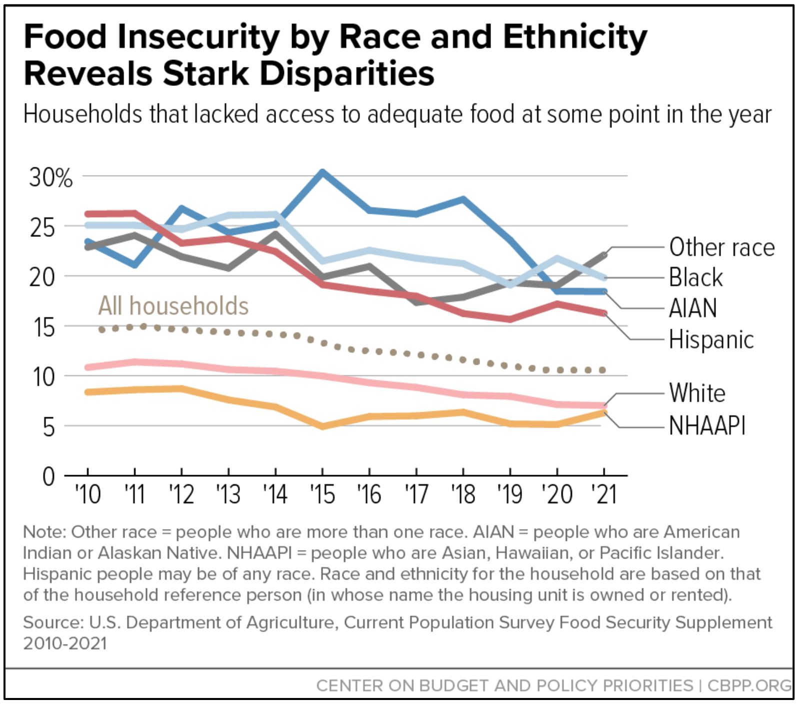
While the Navajo Nation is often compared to West Virginia in land mass and rurality, there are striking differences in food access, particularly healthy food, between the two. West Virginia has 2,126 retail outlets authorized by the US Department of Agriculture to accept payment from the 300,706 of the state's 1.8 million residents enrolled in the Supplemental Nutrition Assistance Program (SNAP), often referred to as "food stamps" (U.S. Department of Agriculture, 2023a). In contrast, those among the approximately 144,000 tribal members who are enrolled in SNAP and living on the Navajo Nation have access to only 84 authorized Nation-based SNAP retail outlets (US Department of Agriculture, 2023b).[10] This disparity in the number of SNAP-authorized retail outlets between the two populations plays a significant role in the ability of low-income Navajo Nation residents to make healthy food choices. This disparity is further exacerbated by the dispersion of what SNAP retailer locations there are across the geographic vastness of the Navajo Nation, making access to the relatively few locations that do exist all the more daunting. Perhaps unsurprisingly, there is a notable disparity in food security between the American Indian/Alaska Native (AI/AN) community and other groups nationally as well (Figure 5). Over the period from 2000 to 2010, twenty-five percent of the AI/AN community were consistently food insecure and were twice as likely to experience food insecurity compared to Whites (Jernigan et al., 2017).[11]

[10] Date on SNAP enrollment is aggregated at the state level only; thus, the total number of enrollees specifically on the Navajo Nation is not available. Data on SNAP retailer locations as of February 2023. Locations within the administrative boundaries of the Navajo Nation were identified using a Geographic Information System (GIS) analysis of retailer latitude and longitude information contained in the SNAP Retail Locator dataset. See QGIS Tutorial and Tips, *Points in Polygon Analysis*. informationhttps://www.qgistutorials.com/en/docs/points_in_polygon.html.

[11] The U.S. Department of Health and Human Services defines *food insecurity* as a "household-level economic and social condition of limited or uncertain access to adequate food." See Carlson, S. J.,

Figure 5

Food Insecurity by Race and Ethnicity[12]



Marketplace disparities between on and off reservation food prices also exist, particularly for basic staples and fruits and vegetables. Even in cases where healthy food choices are available and accessible, indigenous communities living on reservations tend to pay higher prices for them compared to the general population (Figure 6).

According to a First Nations Development Institute (2018) study report, a gallon of milk cost the average U.S. consumer $2.48, but reservation residents in the study

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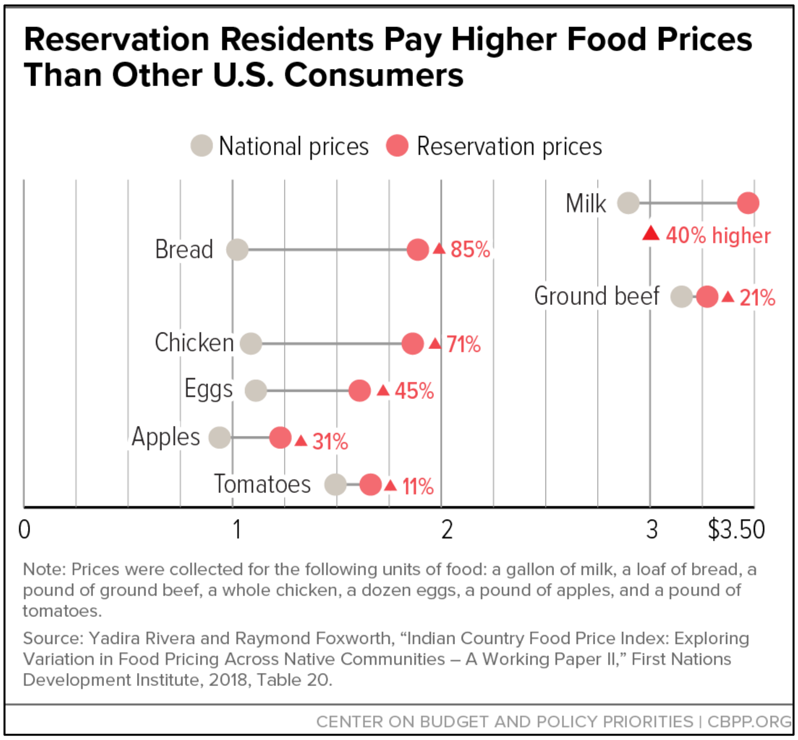
Andrews, M. S., & Bickel, G. W. (1999). Measuring Food Insecurity and Hunger in the United States: Development of a National Benchmark Measure and Prevalence Estimates. *The Journal of Nutrition*, *129*(2), 510S-516S. https://doi.org/10.1093/jn/129.2.510S. According to the Food and Agricultural Organization of the United Nations (FAO) definition, a person is found *food insecure* when they "lack regular access to enough safe and nutritious food for normal growth and development and an active and healthy life." See *Hunger* (n.d.). Food and Agriculture Organization of the United Nations. http://www.fao.org/hunger/en/.

[12] Center on Budget and Policy Priorities. (n.d.). *Food Insecurity by Race and Ethnicity Reveals Stark Disparities.* https://www.cbpp.org/food-insecurity-by-race-and-ethnicity-reveals-stark-disparities-3

paid an average of $3.47, a premium of nearly forty percent. A loaf of bread cost the average U.S. consumer $1.02, but the price in "Indian Country" was $1.89, a roughly

Figure 6

Comparison of Tribal On-Reservation and National Food Prices[13]



85% mark-up. Healthy food choices also suffer a price disparity, with apples (+31%) and tomatoes (+11%) costing more in Indian Country.

1.5 Current Agricultural Practices on the Navajo Nation

Following their signing of the Treaty of 1868 with the U.S. Government, the Navajo people returned to the land now constituting the Navajo Nation. Article V of that Treaty stipulates that "any individual belonging to [the Navajo] tribe, or legally

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[13] Center on Budget and Policy Priorities. (n.d.). *Reservation Residents Pay Higher Food Prices Than Other U.S. Consumers.* https://www.cbpp.org/reservation-residents-pay-higher-food-prices-than-other-us-consumers

incorporated with it, being the head of a family, shall desire to commence farming" would be allocated "a tract of land…not exceeding one hundred and sixty acres." The Article further states that, once such land is allocated, it "shall cease to be held in common, but the same may be occupied and held in the exclusive possession of the person selecting it, and of his family, so long as he or they may continue to cultivate it" (Ratified Indian Treaty 372, 1868). Recognizing that the Navajo would need financial support in establishing their agricultural and herding economies, Article VIII appropriated ten dollars annually per tribal member for up to ten years, to be controlled and allocated as necessary by the Commissioner of the Bureau of Indian Affairs, "for each person who engages in farming or mechanical pursuits." Upon returning to the land after the implementation of the "scorched earth policy," the federal government also recognized the need to establish funding under Article XII of the treaty for an initial purchase of 15,000 sheep and goats and 500 beef cattle. Funding for one million pounds of corn feed was also provided to support Navajo herding while tribal members worked to develop a self-sustaining agricultural economy.

In 1887, the U.S. Congress passed the General Allotment Act, more commonly known as the "Dawes Act," named after its sponsor, Senator Henry L. Dawes of Massachusetts.[14] According to Shoemaker (2015), the Act was designed to, among other objectives, transition the American Indian away from its traditional approach to common land use, and replace it with the Western principle of private ownership. "By forcing the uniform 'allotment' of reservation land to individual Indians," Shoemaker

[14] Pub. L. 49–105

points out, “Congress sought to break up tribes as a controlling social and political influence and to assimilate individual Indians into idealized versions of the agrarian, Jeffersonian farmer, all based on a belief in the transformative power of private property” (p. 384). Not only does this concept contradict with indigenous lifeways and communal practices, but it aimed to establish individualized farming practices and focus on private land ownership, while simultaneously ensuring federal government oversight. Shoemaker goes on to explain that “[i]ndividual Indian allottees initially took title to their allotments not in a simple fee title but rather in a special trust status intended to prevent imprudent alienation of the land and to impose some preliminary federal oversight on individual land management decisions while the Indian allottees' intended transition to “‘civilized’ farmer took effect” (p. 384). As Shoemaker makes clear, these objectives were not met:

> Over time, allotment and the trust restrictions it imposed failed to create prosperous economies of individual farm proprietorships within tribal communities. Instead, patterns of pervasive co-ownership emerged on Indian allotments, with title to individually owned Indian land becoming progressively fractionated as initial allotments passed, typically to multiple heirs, through a formulaic intestacy process and the restraints on alienation imposed by the federal trust status became permanent. Today, the majority of these remaining individual Indian allotments are co-owned by numerous (sometimes several hundred or more) co-owners, and most of these reservation lands are either leased to non-Indians through a Bureau of lndian Affairs (BIA) leasing program or

> are not used at all. This restrictive trust status also creates an enormous and expensive record keeping and administrative burden for the federal government. (pp. 384-385)

On American Indian reservations – so-called “Indian Country” – the laws of property and sovereignty apply differently, often not adhering to uniform territorial legal practices. As Shoemaker (2017), in a law journal article on American Indian property rights, explains:

> …different sovereigns define and regulate different properties within reservation territories. Property jurisdiction varies parcel by parcel depending on factors invisible to an outside observer, in-cluding the owner's identity and the land's legal tenure status. Within reservations, land is owned by both Indians and non-Indians and held in both "fee" and "trust" tenure statuses. Indian-owned fee lands are subject to tribal and some state law. Indian-owned trust lands are federally governed, with some tribal role. Non-Indians' fee lands are subject to varying degrees of state and Tribal control, depending on a list of still other factors. The result is a strange and hard-to-predict mix of Tribal, state, and federal property jurisdictions swirled together within reservation spaces. A sovereign's authority shifts tract by tract, and, in some cases, property right by property right within a single physical piece of land. Two tracts situated immediately adjacent to each other-or even two co-owners joined in shared ownership of the same physical resource-may be subject to entirely different

> rules set by different sovereigns and may have incongruent property rights. (p. 489)

The Navajo Nation is not exempt from multijurisdictional and convoluted agricultural land leasing. As the Diné Policy Institute notes, “[a]fter years of encouraging Navajo people to increase their livestock herds in order as a mechanism of ‘self-reliance’ in what Anglos believed was desert country, the Department of Interior and other parts of the federal government became concerned about the denuding of the landscape and soil erosion” (2018, p. 12). Based on this concern, the Bureau of Indian Affairs regional office divided the Navajo Nation into eighteen land management districts which remain today and enforce grazing and land regulations. These reforms prompted a shift from a stable subsistence economy from farming and livestock (58%) to a significant decline to 1.6% by the mid-1970s. Today, the Navajo Nation Code, *Title 3: Agriculture and Livestock* establishes policy and procedures for agricultural and grazing land leases, otherwise referred to as Land Use Permits (LUPs) (Diné Policy Institute, 2018).

Despite the Treaty of 1868 entitling each head of household or single individual to between 80-160 acres of land, if requested, “farms of this size have never been provided to Diné farm families. Today most Diné farms are ten acres or less, although occasionally more land accumulates in one family over time” (Raymond & Falk, 2018, p. 311). Raymond & Falk go on to explain:

> The BIA issues farm permits, known as land use permits (LUPs), to provide Navajo farmers the opportunity to farm a specified number of acres. In February 2017 948 LUPs were active, and 11,678 acres were permitted. According to the

> Code of Federal Regulations (CFR) 25 Section 162, LUPs have time limits up to ten years or up to twenty- five years in cases of significant financial investment in the farm. The CFR regulations also require that the exact locations of these LUPs be specified by an appropriate method. However, these regulations regarding farm maps/locations and time limits have never been enforced.” (p. 315)

Agricultural leases are regulated by farm boards for each of the five Navajo Nation Agencies. Despite having designated Tribal oversight, Navajo Nation residents still face inequities in accessing and operating land for farming and ranching due to inconsistent review, distribution or reassignment of land use permits. This lack of oversight deters and discourages Diné youth from taking up farming, a fact Raymond & Falk make note of:

> Diné farmers are also discouraged when, over time, farmland parcels are subdivided, reducing access to [irrigation] head gates, and no new head gates are installed. If a new head gate is not installed when a plot is subdivided, accessing water when it is needed may be difficult, especially if disputes arise. (2018, p. 308)

In addition to land use challenges, Navajo Nation farmers and ranchers have suffered the consequences of extractive industries and continue to fight to the present day with federal and state governments to protect what they believe to be inherent water rights. The Navajo Nation Water Rights Commission (NNWRC) describes the problem as follows:

The Nation possesses extensive water rights but *these rights are largely unquantified*. The Navajo Nation claims aboriginal, historic, appropriative and reserved rights to the use of all the water necessary for the Navajo Reservation to be the permanent homeland for the Navajo people. Such rights to water have been judicially recognized by the United States Supreme Court in *Winters v. United States*, 207 U.S. 564, 567 (1908). 'Winters rights' or 'reserved rights' have the following attributes: a priority date based on the date the lands were taken into trust where the water is to be used; are satisfied out of the unappropriated water available when the lands were taken into trust; apply to all tribes whether lands were set aside by treaty, statute or executive order; are not lost through non-use and cannot be abandoned." (n.d., emphasis added)

The Navajo's fight for water recently suffered a significant setback. On 22 June 2023, the U.S. Supreme Court, in the case of *Arizona et al. v Navajo Nation et al*. (599 U.S. ___ (2023), quantified the nature and extent of Navajo Nation water rights, the very rights which the NNWRC acknowledged were previously "unquantified." In its 5-4 decision, the Court held that:

> [t]he 1868 treaty [which allocated to the Navajo Nation its current homeland] reserved necessary water to accomplish the purpose of the Navajo Reservation. See Winters v. United States, 207 U. S. 564, 576–577 (1908). But the treaty did not require the United States to take affirmative steps to secure water for the Tribe. (slip opinion, p.13)

As the lack of rainfall and corresponding drought conditions continue to reduce the Navajos major water source, the Colorado River, and the political battles among the Western states that also rely on that river for their economic livelihood intensify, the Court's decision will largely leave the Navajo Nation on the sidelines., particularly in the struggle to increase agricultural production on the reservation.

Issues like the current land use policies of the Navajo Nation and access to water for irrigation represent significant challenges for those there seeking to enter farming as an occupation. According to the U.S .Department of Agriculture (USDA) *2017 Census of Agriculture* survey (U.S. Department of Agriculture, 2017a), there were at the time 16,129 farms and ranches established on the Navajo Nation (Appendix B).[15] Of these, 11,901 were found to have less than $1,000 in economic revenue annually. Only 1,532 (9%) of all Navajo farms and ranches were found to have an economic size greater than $5,000. The majority of crops grown on the Navajo Nation were animal feed products (Appendix C). Of the 45,109 acres of farmland, 30,010 (67%) were used for animal forage, e.g., hay and haylage production, leaving 15,099 acres designated for corn, squash and melon production. Less than 20% (18.9%, u=1,243) of farms grew vegetables. The average per-farm market value of agricultural products sold across all farms was $5,435.

[15] According to the USDA, the *Census of Agriculture* is a "complete count of U.S. farms and ranches and the people who operate them. Even small plots of land – whether rural or urban – count if $1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the census year." The survey is conducted every five years. The results from the 2022 round are scheduled to be released in 2024. See https://www.nass.usda.gov/AgCensus/FAQ/2022/index.php#2.

There were a total of 24,495 farm and ranch producers (individuals) on the Navajo Nation, of which 53% were women and 47% were men. The average age of farm/ranch operators was 59.5 years old, with only 2,231 (8%) of farmers under the age of thirty-five. Even more alarming for the future of Navajo agriculture, of this number only 591 were under 25 years of age (U.S. Department of Agriculture, 2017b). This survey report makes a compelling argument on the need to increase economic opportunities for small scale farmers, specifically among young/beginner and male-identifying farmers under the age of 25.

In order to increase the agricultural workforce development on the Navajo Nation, enrolled tribal members have access to a number of programs and incentives. The Navajo Nation Department of Agriculture (NNDA) "provide[s] guidance [to] the Diné people in the stewardship of Mother Earth by providing leadership, knowledge and technological assistance in the management and conservation of her resources, for the inheritance of generations to come" (n.d., a). In addition to technical assistance, NNDA offers a "Farm and Garden Incentive" designed to provide financial support to enrolled tribal members holding agricultural land use permits (n.d., b). Funding can be used to facilitate improvement and installation of water systems, soil amendments, fertilizer treatments, innovative practices, seed purchasing, invasive weed management, rodent control, maintaining fencing, erosion control, soil & water conservation, marketing or training/workshops. Additionally, Diné College, a local Tribal college on the Navajo Nation, provides technical assistance and educational pathways for students interested in pursuing careers in agriculture. The Diné College Land Grant Office, Agricultural

Extension Program provides technical assistance to both enrolled students and local farmers. Diné College offers a Bachelor of Science degree in Agriculture to

> support, promote and develop advanced agriculture education in a way that encourages Navajo farming, ranching and agribusiness, protects the well-being of people, plants, animals, and the environment while safeguarding commerce, consumers, health and natural resources and giving the opportunity for student advancement and advanced education in the agriculture sciences." (Diné College, 2023)

Lastly, enrolled tribal members holding agricultural land use permits are able to contact their local chapter to request funding from the Healthy Diné Nation Act 2014, 2020 (as amended) tax revenues to implement farming projects within the local chapter community. Funding opportunities provided by the Healthy Diné Nation Act 2014 and NNDA are often limited and average under $1,000, which nowhere near covers the costs of establishing and maintaining agricultural activities.

1.6 Bidii Baby Foods

For generations there has been a long, steady decline in general agricultural production on the Navajo Nation, and a corresponding increase in the supply and variety of processed and shelf stable foods on offer in local retail outlets. The intent of Bidii Baby Foods (BBF) is to increase agricultural production and establish a new market of fresh produce and value-added products tailored for children in the early childhood period of 0-5 years. BBF is the only agricultural cooperative currently registered domestically in accordance with the Navajo Nation Corporation Act. It operates a sixteen-acre USDA-certified organic farm plot on the Navajo Nation, utilizing an agricultural land use permit issued under the Gadii'ahi/To'Koi chapter.

BBF was co-founded by myself and my husband and sole owner Zachariah Ben. He is a sixth-generation traditional farmer from Shiprock, New Mexico, on the Navajo Nation. I am a public health practitioner from Baltimore, Maryland. We farmed together for several years prior to establishing BBF. Our impetus for undertaking this venture was the birth of our first child during the peak of the Covid-19 pandemic. Our personal experience with food inaccessibility for our young son within our community motivated us to scale-up our own farm production capacity and increase our output of agricultural products specifically targeting early childhood nutritional requirements. We strongly felt that, through the structure of an agricultural cooperative, we could increase a sustainable level of crop production and increase the overall supply of healthy agricultural products. We also felt that increasing a supply of locally grown organic foods for early childhood was the best way to address population health issues such as diabetes, obesity and cardiovascular disease, which are chronic across the Navajo Nation.[16]

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[16] See Maillacheruvu, S.U., "The Historical Determinants of Food Insecurity in Native Communities." Center on Budget and Policy Priorities. (2022, October 4). https://www.cbpp.org/research/food-assistance/the-historical-determinants-of-food-insecurity-in-native-communities; Bullock, A., Sheff, K., Moore, K., & Manson, S. (2017). "Obesity and Overweight in American Indian and Alaska Native Children, 2006-2015." *American Journal of Public Health*, *107*(9), 1502–1507. https://doi.org/10.2105/AJPH.2017.303904; Siegel, K. R., McKeever Bullard, K., Imperatore, G., Kahn, H. S., Stein, A. D., Ali, M. K., & Narayan, K. M. (2016). Association of Higher Consumption of Foods Derived From Subsidized Commodities With Adverse Cardiometabolic Risk Among US Adults. *JAMA Internal Medicine*, *176*(8), 1124–1132. https://doi.org/10.1001/jamainternmed.2016.2410.

During the pandemic, the Navajo Nation government allocated federal American Rescue Plan Act (ARPA) funds to support domestically registered businesses (i.e., those registered with it to operate on Navajo Tribal lands) with small business grants. BBF applied for and received a $40,000 grant in April 2022. This initial funding, along with approximately $10,000 from our personal savings, supported the development and growth of BBF in FY22. It should be noted that the ARPA-funded support was a one-off; the Navajo Nation Department of Economic Development has not to date renewed this grant program beyond FY22 nor established any other supplemental funding schemes similar to this to support farms and small agricultural businesses.

Bidii Baby Foods (BBF) grows a variety of crops exclusively from indigenous heritage seeds, i.e., seeds that have been stewarded by indigenous farmers on indigenous lands. These include corn, squash, melons, beans and amaranth. BBF sells fresh produce as well as value-added traditional foods, including a manufactured indigenous baby food product line. The BBF vision is “a community where traditional indigenous foods are plentiful and accessible in early childhood and beyond.” Its mission is to

> reconnect indigenous families with our longstanding relationship between earth and parenting. We believe that there is a direct connection between nurturing the land and nurturing our children; by understanding how to grow traditional crops and preparing them for young children we are actively dismantling systems of oppression and rebuilding indigenous foodways. (Bidii Baby Foods, 2023)

The word “Bidii” in the Navajo language means “always eating” and is used playfully with children when they show an appetite for the foods they are fed.

The period from 0-5 years of age plays a formative role in both the physical and psycho-social development of a child. The American Academy of Pediatrics (AAP) argues that the “first 1000 days,” from conception to 24 months, represents the most active period of neurological development in a child’s life. In a 2018 policy statement, the AAP stated that

> Improved nutrition in the prenatal period, broad support for breastfeeding, and improved transitional and toddler nutrition all contribute to optimal neurocognitive development in the first 1000 days. Failure to provide adequate essential nutrients during the first 1000 days of life may result in increased expenditures later in the form of medical care, psychiatric and psychological care, remedial education, loss of wages, and management of behavior. (Schwarzenberg et al., 2018)

Keenly aware of the health benefits to be derived from introducing fresh, organic and traditional produce into a child’s diet during the key ages of 0-5 years, we established an agricultural cooperative whose mission focused on growing, manufacturing and marketing such foods.

Agriculture, like any marketplace enterprise, is subject to the economic law of supply and demand. Once we established BBF and its line of value-added products to address the “supply” side of the marketplace, we quickly learned that the “demand” side also needed attention, if we were to achieve the level of success in population health improvements we envisaged. Across the Navajo Nation – and indigenous communities in general -- healthy foods have been strategically and intentionally removed and replaced with commodity and processed foods. Any increase in marketplace demand for traditional, fresh foods would never be realized without a corresponding increase in both access and affordability. For BBF to achieve this would require the introduction of additional educational programming and cost-sharing mechanisms.

1.7 The BEN Initiative

While Tribal recognition of Bidii Baby Foods (BBF) made it eligible to receive funding directly from the Navajo Nation, its status as a for-profit corporation disqualified it from applying for or receiving grants and other funding incentives which require that the recipient have a IRS-recognized tax-exempt status. The BEN Initiative is a not-for-profit corporation registered in the State of New Mexico and is tax-exempt under section 501(c)(3) of the United States Internal Revenue (IRS) Code.[17] It was founded to serve as an umbrella nonprofit organization providing fiscal sponsorship, which, in this case, it does for BBF projects in areas such as traditional/instinctive birth, environmental/agricultural activities and nutrition education.[18] This arrangement –

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[17] The "BEN" in its name is both the surname of its founders and the acronym for "Birth, Environment and Nutrition."

[18] The National Council on Nonprofits defines *fiscal sponsor* as "a nonprofit organization that provides fiduciary oversight, financial management, and other administrative services to help build the capacity of charitable projects." Under a fiscal sponsorship, an organization which has not been granted IRS tax-exempt status gains access to funders who are restricted to giving grants solely to organizations which have such status. See National Council on Nonprofits, "Fiscal Sponsorship for Nonprofits," https://www.councilofnonprofits.org/running-nonprofit/administration-and-financial-management/fiscal-sponsorship-nonprofits.

known as the “hybrid model” – provides BBF with access to a grant-making and funding community formally closed to it, thus allowing it to initiate programs and activities designed to expand its agricultural cooperative capacity, help offset the cost of organic foods in low-income tribal communities and build demand via the reintroduction of traditional foodways.

During the first year under this hybrid arrangement (FY222), the BEN Initiative was awarded three grants totaling $83,560 from the New Mexico Department of Finance and Administration, The Notah Begay III Foundation, and the University of New Mexico Health Extension Regional Office. In the current FY23, grant funding totaling $187,000 has already been secured from Save the Children, WK Kellogg Foundation, New Mexico Farmers Marketing Association and the McCune Foundation. Outyear (FY24) funding already secured totals $215,262, from New Mexico Department of Agriculture/USDA and WK Kellogg. These funding levels are subject to increase over the next several fiscal years to support additional organization growth and outputs.

Chapter 2: Workplace Challenge – Organizational Assessment

2.1 For-Profit/Nonprofit Hybrid Model

Formal partnerships between for-profit and nonprofit entities are growing in popularity. When used strategically, this "hybrid model" approach can advance the company's philanthropic and community focused strategies (Wu, 2019). Sometimes referred to as a "For-Benefit Enterprise," these entities mark a new frontier in business, where organizations generate earned income while giving priority to a greater social mission. This hybrid structure has several benefits. Wu (2019) found that it afforded the ability to provide consistent funding for charitable programs/initiatives while accomplishing strategic (community focused) objectives and receiving steady contributions (from both revenue and donation/grant funding). Writing in the Harvard Business Review, social entrepreneur Sabeti argued that

> for-profit businesses are tackling social and environmental issues, nonprofits are developing sustainable business models, and governments are forging market-based approaches to service delivery. Out of this blurring of traditional boundaries, a different model of enterprise is emerging, driven by entrepreneurs who are motivated by social aims." (2011, p.3)

An article on hybrids and social entrepreneurship in the Stanford Social Innovation Review notes that "hybrids have long existed in certain sectors, such as job training, health care, and microcredit -- but in recent years they have begun to appear in new sectors, including environmental services, consulting, retail, consumer products, catering, and information technology" (Lee et al., 2012). Hybrid models have the flexibility to pursue a social mission utilizing both corporate revenue as well as grants, donations and other sources of funding to sustain operations. Hybrid structures also provide both for-profit and nonprofit organizations the flexibility needed to respond to emerging community needs, consistent with their social mission. For example, nonprofit fundraising can be relied upon more heavily during the formative, market-building years of the operation; once established, market revenues ultimately reach a level to where they replace nonprofit sources as the primary operational funding mechanism for its social missions.

Bidii Baby Foods (BBF) and the BEN Initiative chose to enter into a hybrid model arrangement for a number of reasons, both practical and strategic (Figure 7). Both organizations share the common vision and mission of improving population health outcomes in early childhood by increasing food sovereignty and food security across the Navajo Nation. BBF and the BEN Initiative use the Indigenist Ecological Model as a guiding framework for our “theory of change,” recognizing the inherent need to engage Indigenous communities holistically from historical, cultural, immediate, surrounding and distant/systemic contexts, as opposed to more linear and present-focused Western, dominant-culture frameworks. In utilizing this framework, programming is developed across all levels to achieve food sovereignty in early childhood. As a farm located in Gadii’ahi, Navajo Nation, the decision by BBF to register as a corporation with the Tribal government reflected the practical reality of where its operations were located. More strategically, however, in so registering, BBF enjoyed a variety of benefits, including sales tax exemption and access to small business development support targeting domestic (i.e., Tribal) businesses. The choice to register with the Navajo Nation was not without its downside, however. Non-Tribal grant makers and other potential partners often perceive Tribal organizations as “less regulated” than their more traditional state counterparts, and thus more susceptible to fraud. In my own experience, I had one potential large grantor explicitly tell me that, as a matter of policy, they did not fund Tribal-based organizations. Finally, one of the main benefits BBF derived from the hybrid model was the ability of the tax-exempt BEN Initiative to serve as its fiscal sponsor. This arrangement opened up sources of potential funding not otherwise available to BBF as a for-profit corporation.

Figure 7

Bidii Baby Foods/BEN Initiative Corporate Structure Comparison

To date, funding secured through this hybrid model has been used to implement nutrition education and land-based learning events at the Bidii Baby Foods Farm;

engage staff in professional development; and obtain New Mexico Grown Approved Supplier Program (Farm-to-School) certification. The approach to nonprofit farming represented by the hybrid relationship of BBF and the BEN Initiative is a vitally important one. In a post on the Small Farms Program site of the Cornell College of Agriculture and Life Sciences, a community school farm manager explained the appeal of nonprofit agriculture:

> Non-profit farming provides an attractive model for many reasons. It can enable organizations with an appropriate land-base to diversify their revenue stream as well as to draw in supporters from the community interested in agriculture. Producing fresh food can prove an invaluable and much-needed service to the local community, filling a social niche in which people can be empowered. Mitigating the risks inherent in farming allows for young or beginning farmers to lay the foundation of a career without incurring debt; this will become an increasingly important role for organizations to step into as individuals with farming experience and a college education, but marginal access to additional resources, search for non-traditional ways to start farming careers. (Weldon, 2014)

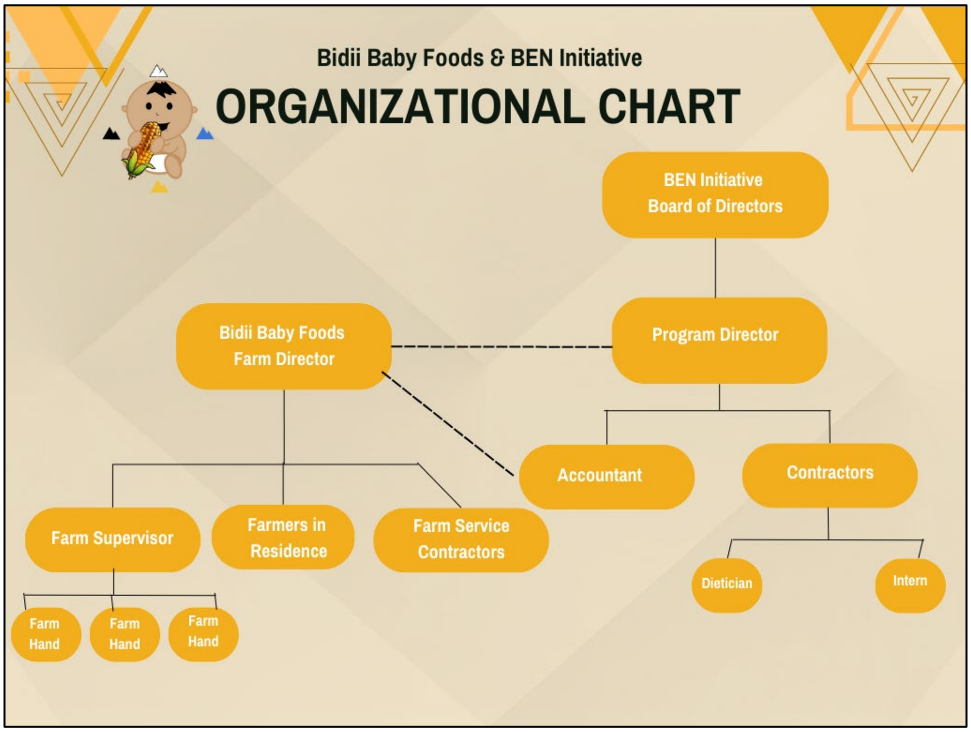
The contribution nonprofit farming can make to the greater effort to build the next generation of indigenous farmers is significant. The most recent U.S. Census employment data for the Navajo Nation found only 1,225 individuals employed in the "agriculture, forestry, fishing and hunting, and mining" occupations, representing less than 3% (2.9%) of the civilian labor force (U.S. Census Bureau, 2021g). And the chances of success for those who do go pursue agriculture and farming as a livelihood are not good. USDA data from 2017 found that, of the 16,129 farms and ranches in operation on the Navajo Nation at the time, almost three-quarters of them (73.7%, n=11,901) had annual sales of less than $1,000 (U.S. Department of Agriculture, 2017a). The financial risks inherent in farming, and the significant capacity building that attracting a younger workforce would require, are simply not conducive to the use of a traditional for-profit business model.

The hybrid model adopted by Bidii Baby Foods (BBF) and the BEN Initiative seeks to address these challenges. It combines the technical knowledge and business acumen of BBF with the access to a more robust and stable array of funding opportunities provided by the BEN Initiative through a fiscal sponsorship arrangement. Operating together in the hybrid model, these two entities can help increase production capacities by attracting younger, low-income individuals and households willing to take up farming. It does so by providing them with administrative, management and training support, as well as financial assistance to help offset start-up costs for inputs such as land and equipment, costs which contribute to the significant inequities faced by indigenous farmers.

Under the hybrid model, the respective roles and responsibilities of Bidii Baby Foods (BBF) and the BEN Initiative are clearly delineated (Figure 8). The BEN Initiative is organized and overseen by a Board of Director, currently consisting of three voting members (Chair, Vice Chair and Secretary). The Board of Directors oversee the Program Director and ensure alignment of BEN Initiative activities with the joint vision and mission of BEN Initiative and BBF. The Program Director conducts grant writing, strategic planning, financial management and contract oversight. The position also oversees the

Figure 8

Bidii Baby Foods & BEN Initiative Organizational Chart



work of a part time Accountant and develops and manages contracts with a local Registered Dietician, as well as manages ongoing internships through Diné College and Northern Arizona University. While administratively there is a clear financial delineation between BBF and the BEN Initiative (separate banking and accounting practices), the Program Director and Accountant for the BEN Initiative maintain constant collaboration with the BBF Farm Director. This allows for a deeper understanding of farm operations, which in turn helps inform BEN Initiative leadership of needs and opportunities for growth. The Farm Director oversees all farm operations and staff, including the Farm Supervisor, Seasonal Farm Hands, Farmers in Residence and Farm Service Contractors.

2.2 The Balanced Scorecard

I selected the Balanced Scorecard as the tool with which to evaluate the performance of the Bidii Baby Foods (BBF)/BEN Initiative hybrid model. This strategic performance measurement tool was introduced in a 1992 *Harvard Business Review* article by David Norton, the CEO of Nolan Norton Institute, and Robert Kaplan, a professor at Harvard University, entitled “The Balanced Scorecard – Measures That Drive Performance” (Kaplan & Norton, 1992). In their article, they begin with a simple observation: “What you measure is what you get” (p.71). Pointing out that an organization’s measurement system has a significant impact on both managers and staff, they state that “[e]xecutives…understand that traditional financial accounting measures like return-on-investment and earnings-per-share can give misleading signals for continuous improvement and innovation” in today’s competitive environment (p.71). Arguing that managers should not have to “choose between financial and operational measures'' when evaluating their organizations, they acted:

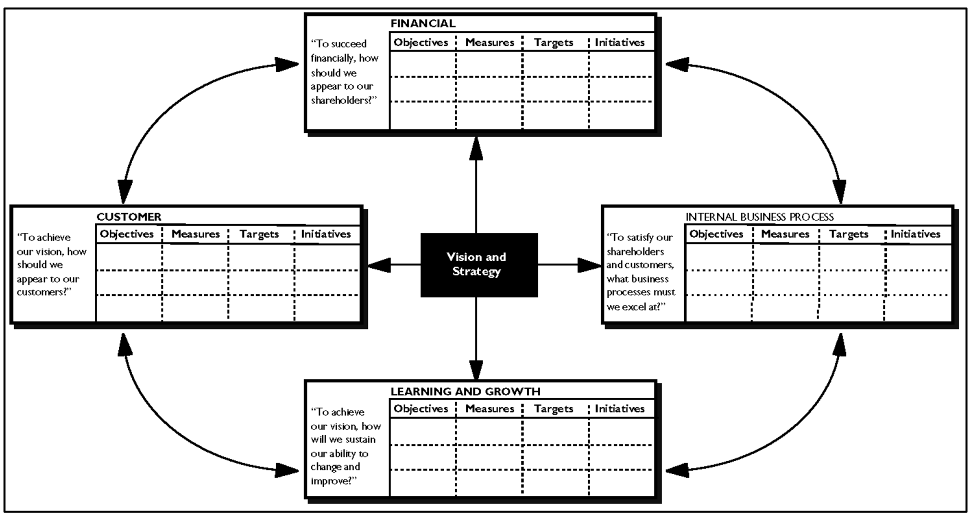
> …we devised a ‘balanced scorecard – a set of measures that gives top managers a fast but comprehensive view of the business. The balanced scorecard includes financial measures that tell the results of actions already taken. And it complements the financial measures with operational measures on customer satisfaction, internal processes, and the organization’s innovation and

improvement activities – operation measures that are the drivers of future financial performance. (p.71)

In a later article on the Balanced Scorecard appearing in the *California Management Review*, Kaplan and Nolan (1996a) identified the elements involved in "translating vision and strategy," what they called the "four perspectives": Financial, Customer, Internal Business Processes and Learning & Growth (Figure 9). These perspectives, they said,

Figure 9

Translating Vision and Strategy: Four Perspectives[19]



"permit a balance between short-term and long-term objectives, between desired outcomes and the performance drivers of those outcomes, and between hard objective measures and softer, more subjective measures" (p.56). The breadth represented by these four perspectives, particularly their balance of quantitative and qualitative metrics, makes the Balanced Scorecard an ideal strategic management tool for

[19] Kaplan, R.S. & Norton, D.P. (1996). Linking the balanced scorecard to strategy. *California. Manage. Rev.*, 39(1), Exhibit 1, p.54

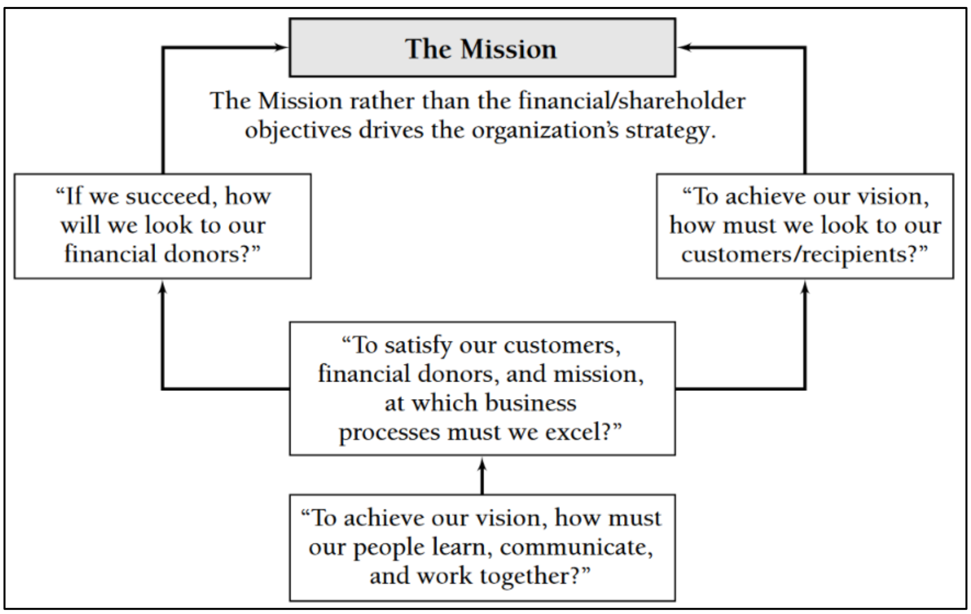
evaluating nonprofit and hybrid business models, with the intent of helping organizations align departmental and personal goals with their overall mission and strategy. For this reason, I selected it as the most appropriate tool with which to evaluate the BBF/BEN Initiative hybrid organizational model.

2.3 Balanced Scorecard Design

My Balanced Scorecard design adopts the "four perspectives" of the Kaplan and Norton framework as my key performance indicators, which are Financial, Customer, Internal Business Processes and Learning & Growth. To determine the Financial status of the hybrid organization of Bidii Baby Foods (BBF) and the BEN Initiative, I asked "*How do we look to shareholders and/or financial donors?*" To answer this question, I looked at Financial data such as sales, gross margin and net profits/excess revenue. To determine the organization's status with Customers, I asked "*How do customers see us?*" In order to quantify this, I reviewed the number of customers and their geographic and demographic data. I could have also conducted a customer satisfaction survey to solicit qualitative and quantitative feedback; for technical reasons I did not do so for this analysis but have plans to do so in the future. To determine the Internal Business Processes, I asked "*What must we excel at?*" To answer this question, I reviewed Farm logs, Manufacturing Processes, Institutional purchases and customer complaints to determine current strengths and weaknesses, as well as opportunities for improvement within Internal Business Processes. Lastly, to determine the Learning & Growth Opportunities, I asked, "*Can we continue to improve and create value?*" My examination of staff and cooperative member qualifications and development of new products were key in determining the organization's capacity to improve and continue generating revenue and interest in its products. My Balanced Scorecard development was also informed by Kaplan's (2001) later adaptation of his framework to fit the unique elements of nonprofit organizations (Figure 10). The key difference with this particular framework is that nonprofit organizations are focused on their mission to drive their strategy, rather than financial and shareholder objectives.

Figure 10

Kaplan Nonprofit Organization Balanced Scorecard Framework[20]



Taking these frameworks into account, I and the rest of the Bidii Baby Foods (BBF) and BEN Initiative leadership teams jointly crafted a Balanced Scorecard designed to facilitate its own evaluation (Figure 11). The joint Vision and Mission statements on the left lay out the overarching focus to the organizational strategy. The right panel

[20] Kaplan, R. S. (2001). Strategic Performance Measurement and Management in Nonprofit Organizations. *Nonprofit Management & Leadership*, *11*(3), p.361, Figure 2, "Adapting the Balanced Scorecard Framework to Nonprofit Organizations." https://doi.org/10.1002/nml.11308

incorporates the four perspectives included in the Kaplan & Norton scorecard design, i.e., Financial, Customer, Learning and Growth and Internal Business.

Figure 11

Bidii Baby Foods LLC & BEN Initiative Balanced Scorecard

Under the Financial perspective, Sales Revenue (including Institutional Sales and Itinerant Sales), Donation Revenue, Grant Revenue, Expenses, Assets and Return on Investment were selected as Key Performance Indicators (KPIs). Under the Customer perspective, KPIs included Unique & Repeat Customers, Average Purchase Amount, Geographic Distribution of sales, Satisfaction Surveys and Social Media Followers/Engagement. Under the Learning and Growth perspective, KPIs included Training/Professional Development, Innovation (New Programs, New Specialty Crops, New Products and Product Value Increases), Awards/Recognition, Local Program

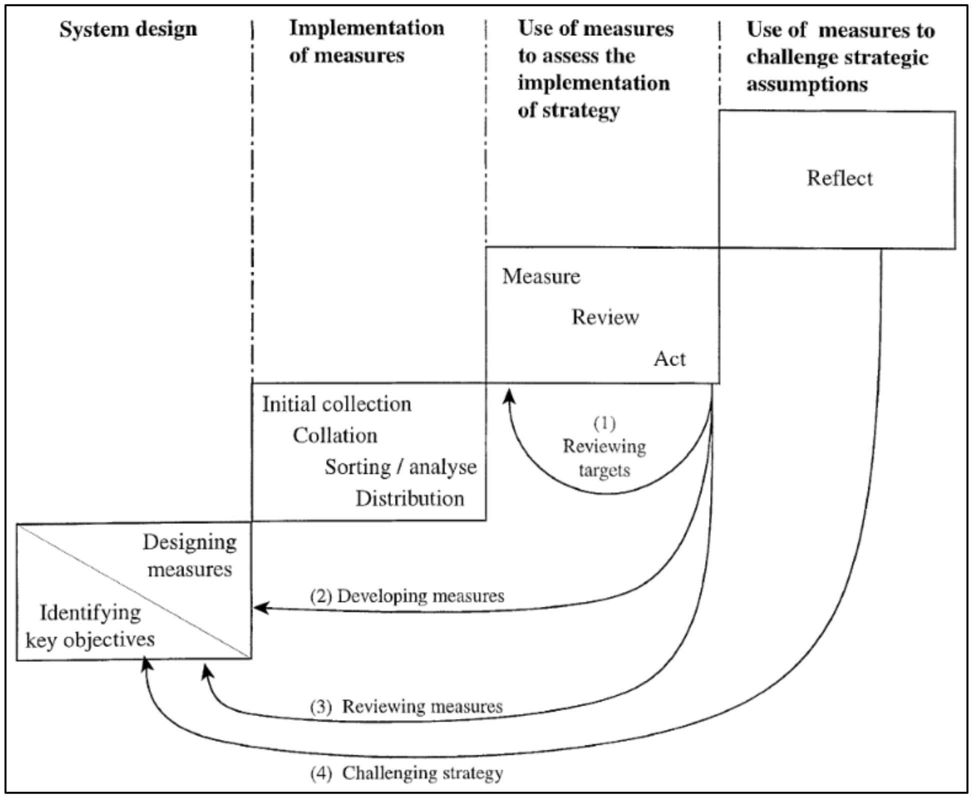
Partnerships and Community Participation in Farm Events. Lastly, KPIs for Internal Business included the Number of Cooperative Members, Number of Volunteers, Number of Staff/Seasonal Hours, Employee Satisfaction, Efficiency & Compliance (SOP Logs), Certifications/Permits (WIC/SNAP, New Mexico Farmers' Marketing Association (NMFMA) Approved Supplier, Manufacturing, American Indian Foods, etc.), and Stakeholder Reporting (Taxes-Navajo Nation, New Mexico, Grant Reporting). All perspectives in the scorecard are interconnected and aim to evaluate and operationalize the joint purpose of achieving food sovereignty in early childhood. No one perspective or KPI is more valuable than another. All four perspectives should be analyzed concurrently and regularly (annually) to assess measures within each KPI and determine overall performance and alignment with organizational vision and mission.

2.4 Balanced Scorecard Implementation

There is a process involved in designing, implementing and using a performance measurement system, including Balanced Scorecards. Bourne et al. (2000, p. 757) found that the development of performance measurement systems takes place in three phases: design of the measures, implementation of the measures, and the use of the measures (Figure 12). During the system design phase of the Bidii Baby Food (BBF)/BEN Initiative Balanced Scorecard, the joint vision and mission along with an overarching purpose of achieving food sovereignty in early childhood were used to guide the development of KPIs.

Figure 12

Phases In Developing a Performance Measurement System[21]



To further aid in the development of KPIs, I made use of what the United Nations Food and Agriculture Organization (FAO) (2019) defines as the "four dimensions of food security." While food security differs from food sovereignty, food security is a foundational element of food sovereignty, one that can be more easily quantified and evaluated. These dimensions help describe the status of food security and nutrition in the world, and include:

1. <u>Availability</u>: Sufficient food supply of appropriate quality.

[21] Bourne, M., Mills, J., Wilcox, M., Neely, A., and Platts, K. (2000), "Designing, implementing and updating performance measurement systems", *International Journal of Operations and Production Management*, Vol. 20 No. 7, Figure 1, p.757. https://doi.org/10.1108/01443570010330739

2. Access: Adequate resources (including infrastructure and economic resources) to actually acquire appropriate and nutritious foods (i.e., the presence and functioning of appropriate entitlements).
3. Utilization: The ability to actually consume and benefit from an adequate diet, which is strongly affected by overall health status, clean water, appropriate sanitation, and health care.
4. Stability: Consistency in access to adequate, nutritious food and nonfood resources—in other words, the avoidance of or resilience to natural, financial, or social shocks, as well as stability in food security throughout seasonal or gradual changes.

These four components were used as KPIs in my Balanced Scorecard to evaluate BBF and the BEN Initiative's ability to achieve elements of each component, and to set goals toward improving outcomes. Assuming these foundational components of basic food security can be evaluated, and food security can be achieved, the BBF and the BEN Initiative can work towards defining food sovereignty in early childhood within a Navajo-specific context.

2.5 Balanced Scorecard Review

In the Balanced Scorecard developed for Bidii Baby Foods (BBF) and the BEN Initiative, I selected Key Performance Indicators (KPI) as measures within each of the four perspectives (Financial, Customer, Learning & Growth and Internal Business). Next, I conducted data collection and analysis on each KPI during the implementation of measures. Once measures were collected and analyzed, targets were determined and used to review/compare outcomes of each KPI. Reflection is an important phase in the implementation process, in that it encourages organizations to return to the first phase of the cycle and ensure alignment with their vision/mission and overarching purpose. In the case of BBF/BEN Initiative, the results of the scorecard are summarized below as these measures pertain to and reflect the four FAO pillars of food security -- availability, access, utilization and stability – articulated by FAO.

2.5.1 Financial Key Performance Indicators (Table 1)

During FY22, Bidii Baby Foods (BBF) generated $24,932 in product sales revenue and $1,032 in additional revenue from services (e.g., community presentations, conference honorariums, etc.) and other income (i.e., food demonstrations). Neither BBF nor the BEN Initiative received private donations during FY22. Grant funding was by far the largest category of income. BBF received one grant from the Navajo Nation Department of Economic Development (NNDED) in the amount of $40,000. This was special unrestricted funding for domestically registered corporations on the Navajo Nation, designed to help sustain small tribal businesses in the latter phases of the Covid-19 pandemic. BBF also received a financial award from Building Nations, LLC, as first place prize money for a tribal business plan competition at the Annual Navajo Nation Economic Summit in February 2022. The BEN Initiative only received grant revenue and did not receive revenue from sales or other sources. In FY22, it was awarded a total of $83,800 in grant funding, including $10,800 from the University of New Mexico, $23,000 from the Notah Begay III Foundation, and $50,000 from the Kellogg Foundation.

Table 1

Fiscal Year 2022 (FY22) Financial Key Performance Indicators & Measures[a]

Key Performance Indicator	Measure: Bidii Baby Foods LLC (USD$)		Measure: BEN Initiative (USD$)	
Sales Revenue	Product sales	24,932		
	Services	632		
	Other income	400	N/A	
	Total cash revenue:	25,964		
Donation Revenue		0		0
Grant & Award Revenue	*Grant:*		*Grant:*	
	Navajo Nation Department		University of New Mexico	10,800
	of Economic Development			23,000
	(DED)	40,000	Notah Begay III Foundation	50,000
	Award:		WK Kellogg Foundation	
	Building Nations			
		6,000		
	Total Grants	40,000	*Total Grants*	83,800
	Total Award	6,000		
Expenses		60,946		20,226
Assets	Cash on hand	11,018	Cash on hand	63,574
	Machinery & Equipment		Machinery & Equipment	
	Farmland	16,000	Farmland	0
	Buildings	0	Buildings	0
		0		0
	Total Assets	27,018	*Total Assets*	63,574
FY 2022 Overall Return on Investment (ROI)	Total Income	71,964	Total Income:	83,800
	Total Expenses	60,946	Total Expenses:	20,226
	Excess Revenue (Income minus Expenses)	11,018	Excess Revenue (Income minus Expenses)	63,574
	ROI	18.1%	*ROI*	314.3%

[a.] Fiscal Year is 1 January-31 December 2022.

Total expenses incurred by Bidii Baby Foods (BBF) in FY22 were $60,946. Just over half of these expenses were personnel costs. Investment in farm infrastructure and equipment was the next largest cost center. The BEN Initiative had total FY22 outlays of $20,226. Approximately 40% of these were personnel costs; the remaining were for land-based learning and community-based events designed to increase community awareness of locally grown and traditional foods. At the start of FY23, BBF had $11, 018 cash-on-hand and $16,000 in capital machinery and equipment, for a total of $27,018. The BEN Initiative had $63,574 cash-on-hand and no capital equipment assets.

Overall, the project return-on-investment (ROI) for both Bidii Baby Foods (BBF) and the Ben Initiative show promising results (Table 1). According to the Harvard Business School, "[r]eturn on investment is typically calculated by taking the actual or estimated income from a project and subtracting the actual or estimated costs. That number is the total profit [or, in the case of the nonprofit BEN Initiative, excess revenues] that a project has generated or is expected to generate. That number is then divided by the costs" (2020). The formula for calculating return on investment is the net profit divided by the cost of investment, times one hundred. In project management, the formal can be reconfigured in slightly different terms to determine a specific project return on investment. This is measured by the project cost subtracted from the financial value of the project, times one hundred.

Traditional ROI = (Net Profit / Cost of Investment) x 100

Project ROI = [(Financial Value - Project Cost) / Project Cost] x 100

Bidii Baby Foods (BBF) net operating revenues for FY22 were $71,964 and its project costs (expenses) were $60,946. Under the project ROI formula, the FY22 ROI was 18.1%. The BEN Initiative net profit (excess revenue) for FY22 were $63,574 and its project costs were $20,226, resulting in a project ROI of 314.3%. Both entities realized a profit/excess revenue and show continued potential for similar results in coming fiscal years. However, if we consider BBF to be working toward increasing the supply of local foods, and the BEN Initiative working toward increasing the demand for such foods through its programs (e.g., community awareness, conscientious consumerism, nutrition, education, etc.), we see that the former operations are significantly more costly than the latter. BBF realized a $11,018 profit in its first full fiscal year of operations. While it is positive, it is not sufficient to scale up operations and increase production in significant amounts in the coming fiscal years and could not have been achieved without the grant and award received. Having the BEN Initiative as its fiscal sponsor allowed BBF to offset costs of agricultural inputs, personnel, marketing and other needed items, significantly increasing and expediting the financial stability of the overall project.

2.5.2 Customer Key Performance Indicators (Table 2)

Bidii Baby Foods (BBF) had 119 one-time customers and two repeat customers in FY2022, based on Square Online transaction data[22]. The average purchase for a single transaction was $57.73. Twenty-nine sales were made on the Navajo Nation, primarily onsite at the Bidii Baby Foods Farm or at the Shiprock Farmers Market. Ninety-two sales were made off the Navajo Nation. Seventy-two of these sales were made to customers within a 250-mile radius of the Navajo Nation; the majority of whom were in border towns and major Southwest cities, including Gallup, NM; Farmington, NM; Durango, CO; Albuquerque, NM; and Phoenix, NM. Additionally, online orders were received from customers across a total of 20 different states.

Social media was leveraged to gauge customer engagement. A link was provided to online customers as part of their electronic purchase receipt. Through this link customers could provide feedback/product reviews; however, no responses were received via this means in FY22. Bidii Baby Foods (BBF) used Instagram (IG) as its only social media platform. This was done strategically, as IG is known to have a user base in the demographics that BBF seeks to influence. BBF had an IG following of 1,872 at the end of FY22. It averaged over 200 "likes" and over 3,700 "views" on posted content. Among all IG followers, 80.3% self-identified as women and 19.6% identified as men. Eight of ten (80.8%) followers are between the ages of 18-45 (typical childbearing years). The website analytics showed BBF with an average of 890 unique page views per

[22] *Square Online* is an e-commerce company providing turn-key online sales applications to businesses. https://squareup.com/us/en?v=all

month during FY22; additionally, the data indicated a spike in page views around holidays. A connection between social media content and website engagement was also seen on days with highly viewed or liked content.

Table 2

Fiscal Year 2022 (FY22) Bibii Baby Foods Customer Key Performance Indicators & Measures

Key Performance Indicator	Measure	
Unique & Repeat Customers	No. unique customers	119
	No. return customers	2
Average Purchase Amount	Average $/retail purchase	58
	Average $/wholesale purchase	1,000
Geographic Distribution of Sales	Total Tribal (Navajo Nation) sales	29
	Total non-Tribal sales	92
	Total unique U.S. shipment destinations (States)	20
Satisfaction Survey	Total online point-of-purchase product reviews	0[a]
Social Media Followers, Website & Engagement	Instagram (IG)	
	Total IG followers	1,872[b]
	Average IG "Likes" on Content	211
	Average IG "Views" on Reels	3,776
	IG women followers, %[c]	80.3
	IG men followers, %	19.6
	IG followers, average age, % by cohort:	
	13-17 years of age	1.0
	18-24 years of age	8.8
	25-34 years of age	40.5
	35-44 years of age	31.5
	45-54 years of age	10.9
	55-64 years of age	3.8
	65+ years of age	3.5
	Website Analytics	
	Average unique monthly page views	890

a. No customer feedback/product reviews were received in the online marketplace (Square Online) transaction data.
b. As of 31 December 2022.
c. IG users have the ability to self-identify as "woman" or "man.".

2.5.3 Learning & Growth Key Performance Indicators (Table 3)

Selected Bidii Baby Foods (BBF) staff, consisting of the Owner, Manager and four seasonal farmhands, completed two hours of training on Standard Operating Procedures (SOP) for farm safety and product manufacturing. The BBF Owner and Manager completed Tier 1 & 2 Farm Safety training with the New Mexico Farmers Marketing Association. The completion of this required training – coupled with the submission of an application, farm risk assessment and farm map, and the successful completion of a state inspection – resulted in BBF being authorized to engage in farm-to-school sales through the New Mexico Grown program. Additionally, BBF's Owner attended a 30-hour Native American Agriculture Fund Indigenous Cooperative Development training program.

In FY22, Bidii Baby Foods (BBF) sought to expand both its program offerings and selection of agricultural products. It initiated one new program called "Land-Based Learning." In this program, students and community members were invited to come to the Bidii Baby Foods Farm for a farm-to-table learning experience. This program reached 85 youth and adults with farm-to-table cooking education and meals. BBF also put four additional specialty crops into production: *Jemez Blue Corn*, *Oaxacan Green Corn*, *Hopi Amaranth* and *Hopi Casaba*. These crops were identified as being among the staple foods which were regularly a part of the Navajo diet pre-colonization, and, in this case, were grown from indigenous heritage seeds. With the addition of these new crops, BBF established and offered for sale two new retail products in FY22: *Blue Cornmeal* (sold in bulk to local school districts) and *Neeshjhizhii doo Amaranth Bi'taa'ni,* a new baby dehydrated baby food product that blends Navajo Dried Steamed Corn with Hopi Amaranth grain.

Table 3

Fiscal Year 2022 (FY22) Learning & Growth Key Performance Indicators & Measures

Key Performance Indicator	Measure		
Training & Professional Development	Topic	Total staff	Total hours
	Standard Operating Procedures	6	12
	Tier 1&2 Farm Safety	2	16
	Native American Ag Fund Co-op	1	30
Innovation (New Programs, New Specialty Crops, New Products)	Initiatives	Total	
	New Programs Land Based Learning (Farm to Table)	1	
	New Specialty Crops Jemez Blue Corn/ Oaxacan Green Corn /Hopi Amaranth /Hopi Casaba	4	
	New Products Blue Corn Meal (Bulk) /Neeshjhizhii doo Amaranth Bi'taa'nil	2	
	Product Value Increase, $	2/lb	
Awards & Recognition	Recipient of the *Heart of the Land Award for Outstanding Leadership in Farming and Ranching* (New Mexico Food & Farms Day Awards, January 2023)		
Local Program Partnerships Established	Tumbleweed Nutrition Intertribal Agriculture Council		
Community Participation in Bidii Baby Foods-Sponsored Farm Events	Americorps Work Day Navajo-NARCH Work Day Planting Days (3) Father's Day Butchering Event Corn Pollen to Cuisine	Camp Out in Cudeii: 1st Steam DEAP Land Based Learning Northern Navajo Fair Parade Shiprock Harvest Festival Haunted Harvest	
	Total participants	206	

During FY22, Bidii Baby Foods (BBF) was the recipient of several awards and established new marketing relationships. It was nominated by the New Mexico State

Governor's Office for the *Heart of the Land* award, given for outstanding leadership in farming and ranching, and was publicly recognized in a ceremony at the State Capital that was widely covered on local media channels and social media outlets. Two formal partnerships were established under memorandums of agreement with Tumbleweed Nutrition, LLC, and the Intertribal Agriculture Council. Tumbleweed Nutrition is an indigenous woman-owned dietetics service provider who, under this partnership, provided contract dietetic services for community nutrition education programming. The Intertribal Agriculture Council is a nationwide, US-based organization whose mission is to highlight food products manufactured by members of tribal nations. It maintains a strict process for the "American Indian Foods" certification, hosts a large annual conference to connect indigenous food producers with resources, and shares products at national and international trade shows.

During FY22, Bidii Baby Foods (BBF), with funding support from the BEN Initiative, also hosted a number of community-based events, including: *Americorps Work Day*, *Navajo-NARCH Work Day*, *Planting Days* (x3), *Fathers Day Butchering Event*, *Corn Pollen to Cuisine*, *Camp Out in Cudeii*, *DEAP Land Based Learning*, *Northern Navajo Fair Parade*, *Shiprock Harvest Festival* and a *Haunted Harvest*. A total of 206 community members attended these events. While attending, community members learned elements of farming, production of traditional foods and nutrition education.

2.5.4 Internal Business Key Performance Indicators (Table 4)

In FY22, Bidii Baby Foods (BBF) had a total of three Cooperative Members. Two farms totaling twenty-two acres, Bidii Baby Foods Farm and Curley Farm, were

Table 4

Fiscal Year 2022 (FY22) Internal Business Key Performance Indicators & Measures

Key Performance Indicator	Measure: Bidii Baby Foods LLC		Measure: BEN Initiative	
Number of Cooperative Members	Total number of cooperative members	3	N/A	
	Total participating farms	2		
Number of Volunteers	Total number of volunteers	67	N/A	
	Total hours per volunteer (avg.)	6		
Number of Staff	Total number of full-time staff	2	Total number of part-time staff	2
	Total number of seasonal staff	4	Total number of contractors	1
	Total number of contractors	4	Total number of interns	1
Employee Satisfaction	Staff Survey (SS) not administered in FY22		Staff Survey (SS) not administered in FY22	
Efficiency & Compliance	Number of weekly irrigation events	2-3	N/A	
	Number of weekly harvesting events	2		
	Average work hours, seasonal staff (weekly)	20		
	Number of monthly processing events	1-2		
Certifications & Permits	WIC approved Farm Stand[a] NMFMA Approved Supplier[b] New Mexico Manufacturing Permit American Indian Foods		N/A	
	Total certifications & permits	4		
Stakeholder Reporting	*NN Form 100[c]; IRS Form 1099-MISC[d]*		*IRS Form 990-EZ[e]; Form 1099-MISC[d]*	

a. Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), U.S. Department of Agriculture
b. New Mexico Farmers' Marketing Association (NMFMA)
c. Navajo Nation Tax Commission (NNTC), Sales Tax, Form 100 (Designation of Individual)
d. U.S. Internal Revenue Service (IRS) Form 1099-MISC (Miscellaneous Income)
e. U.S. Internal Revenue Service (IRS) Form 990-EZ (Short Form Return of Organization Exempt From Income Tax Under Section 501(c), 527, or 4947(a)(1) of the Internal Revenue Code

represented under the BBF cooperative. It had 67 unique volunteers throughout the growing season (May 1- Oct 31, 2022). The average number of hours spent volunteering was six. BBF had two full time staff (Owner and Manager) as well as four seasonal part-time farmhands. It hired four contractors (for tractor services, welding services, dietetics services and community education services). The BEN Initiative was staffed by one part-time Director and one part-time contractor (Bookkeeper). No employee satisfaction survey (ESS) was administered during FY22. An employee satisfaction survey scheme will be implemented in FY23, based on the Society for Human Resource Management (SHRM) Employee Engagement Survey template (Society for Human Resource Management (SHRM), 2022).

Several metrics were examined in the category of Efficiency & Compliance. According to the Bidii Baby Foods (BBF) irrigation logs, flood irrigation took place an average of two to three times per week, two times weekly in early months between May and June, and three times weekly in the hotter months between July and August. Harvest and traceability logs showed an average harvest of twice weekly between the months of August through mid-October.[23] The average weekly working hours for seasonal staff during peak harvest season (Aug 1-Oct 15) was twenty-four; this represented, on average, about three full days of work per week. BBF commercial food products were packaged at the Gallup Community Pantry Commercial Kitchen between

[23] *Traceability logs* are designed to track the progress of BBF products through the various stages of production, from planting to harvest to packaging. They are required to ensure that, were there a need to recall a particular product batch, BBF would be able to identify it. This tracking is required of all New Mexico approved farm-to-school organizations.

Sept 1, 2022 and Jan 31, 2023. At this rental space, approximately 200-300 bags of product were processed and packaged by BBF staff each nine-hour session. Processing took place on average 1-2 times per month.

In the category of Certifications & Permits, Bidii Baby Foods (BBF) obtained four during FY22: WIC Approved Farmstand permit, NMFMA (NM Grown) Approved Supplier Certification, New Mexico Manufacturing Permit and American Indian Foods Certification. The WIC Approved Farmstand permit allowed BBF to accept WIC Farmers Market Nutrition Program (FNMP) dollars as a form of payment onsite at both the Bidii Baby Foods Farm and local farmers markets, using the SoliMarket app.[24] The WIC FMNP makes extra funds available to WIC recipients and elders 60+ years of age to use in purchasing healthy produce from local farmers. The NMFMA Approved Supplier Certification allowed BBF to sell fresh and dehydrated food products to schools, early childhood programs, elder care facilities and food banks across the state of New Mexico. Sales to this group of customers at the wholesale level accounted for increased revenue in FY22. The NM Manufacturing Permit allowed BBF to sell packaged products to retailers and wholesalers located within the state of New Mexico, as well as sell products for national or international trade. The American Indian Foods certification allowed the Intertribal Agriculture Council to include BBF products in the product line of indigenous producers they promote virtually at regional events and at national and international trade shows.

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[24] *SoliMarket* is a mobile payment application for Farmers' Markets. It enables farmers to sell fresh fruits, vegetables, and herbs to shoppers participating in the WIC Farmers' Market Nutrition Program. See https://www.solisystems.com/solimarket/

Both Biddi Baby Foods (BBF) and the BEN Initiative had several stakeholder reporting responsibilities. As a domestically registered corporation on the Navajo Nation, BBF submitted an annual sales tax report (Form 100) to the Navajo Nation Tax Commission Office, indicating key personnel and annual operations. Sales by BBF on the Navajo Nation are exempt from both the general sales tax and the 2% "Unhealthy Foods and Beverages" tax. BBF also reported on non-employee compensation (1099-MISC). The BEN Initiative submitted an annual Internal Revenue Form 990-EZ federal tax return and filed a copy with the State of New Mexico; both met the requirement that all tax-exempt organizations report their programs, revenues, expenses and assets, as well as board of director information. The BEN Initiative also reported on non-employee compensation (1099-MISC).

2.6 Summary of Key Findings

The application of the Balanced Scorecard provided me insight into financial, customer, learning and growth and internal business key indicators for the Bidii Baby Foods (BBF) and the BEN Initiative joint program. I shared the findings from each KPI with BBF and the BEN Initiative leadership teams, and I also identified and shared overall key findings from each category.

Financially, both Bidii Baby Foods (BBF) and the BEN Initiative realized profit/excess revenue in FY22. However, it is important to note that this would not have been possible without the support of funding grants. BBF overall expenses were $60,946. It received one grant and one award totaling $46,000 to support operations. The revenue from product sales and services was $25,963. Had BBF not received the level of grant funding it did in FY22, it would have suffered a net operating loss of $34,983. Over 50% of its expenses were wrapped up in personnel costs, along with an additional 30% in the infrastructure and equipment costs required to sustain the acreage it had under production. Given these costs, the potential return-on-investment to be realized from product and services revenue alone are insufficient to sustain operations, and thus poses too great of a financial risk for the size and nature of BBF operations.

Likewise, the BEN Initiative was sustained entirely through grant funding. As an IRS-recognized tax-exempt public charity, the majority of funding for its programs came from individual donations and grants from other tax-exempt organizations. In FY22, the BEN initiative received grants totaling $83,800 and spent $20,226 on project costs. The resulting excess revenue of $63,574 will be available in FY23 for community education, personnel and infrastructure. The ability of the BEN Initiative to attract funding not available to Bidii Baby Foods (BBF) demonstrates the value of the hybrid model. The excess revenue provided by the BEN Initiative proved essential in offsetting both BBF product costs, as well as providing financial support toward building infrastructure and covering personnel costs. Jointly, BBF and the BEN Initiative revenue was $155,731 during FY22. Combined expenses reached $81,172. Alone, BBF would have experienced an operational deficit; however, with grant funding for BBF and the BEN Initiative combined, the total excess revenue available for future projects and programs was $74,560. Using a hybrid business model, consisting of a for-profit unit primarily for sales revenue (BBF) and a nonprofit unit primarily for the receipt of grants and donations

(BEN Initiative), allowed the combined program to not only cover costs, but also provided excess revenues to apply against future program activities. Since traditional farm financing loan options were not utilized, the overall financial risk to BBF was greatly reduced. This experience shows that the hybrid model can be an ideal business structure for historically marginalized farmers (Black, Indigenous and People of Color (BIPOC), female) and young farmers (under 35) who do not have access to capital to ramp up farming operations.

In terms of its market impact, Bidii Baby Foods (BBF) reached a large number of new unique customers; only two were repeat customers, which is to be expected with a new operation. Roughly five percent of new customers were wholesale buyers from local schools, early childhood programs and markets. The average individual customer sale was $57.73, which represents the purchase, on average, of 3 lbs. of product per transaction. The average wholesale buyer purchase was significantly higher, at $1,000.00, representing around 100 lbs. of product sold in each transaction. The majority of the products were sold on the Navajo Nation and in surrounding border towns near the reservation. Online sales were made to customers in twenty states.

This was Bidii Baby Foods (BBF)'s first year participating in the WIC Farmers Market Nutrition Program (FMNP) and SNAP Double Up Food Bucks (DUFB), and it was not well-known to the participants of those two programs; consequently, it realized less than $100 in sales through these programs. BBF intends to actively reach out to and enroll more members in these programs, while also creating spaces and opportunities within the community for their use. Social media engagement was fairly high on

Instagram, with several hundred people “liking” each post, and several thousand “viewing” videos. BBF may consider extending social media reach by participating in more platforms including Facebook and TikTok.

From a learning and growth perspective, Bidii Baby Foods (BBF) completed extensive training, and received a prestigious award from the New Mexico Governor’s Office, one that is typically given to farms that have been operating for much longer periods of time. This speaks to both the organizational strength of BBF and the quality/uniqueness of its product line. The BBF product line was created in FY21, starting with three products. In FY22, two products were added, along with a slight product value increase as well as other specialty crops available (fresh and dehydrated). Plus, its Navajo Dried Steamed Corn products increased in value from $13/lb. to $15/lb. Over 206 unique community members were engaged in land-based learning events, thus increasing community awareness of Bidii Baby Foods Farm, locally available produce and baby food products and nutrition information.

From an internal business perspective, the number of cooperative members is minimal, primarily just incorporating founding members during this first full year of operation. Bidii Baby Foods (BBF) aims to first build a foundation as a profitable farm with strong buyer connections in the local community. It anticipates this could take between 2-5 years to establish, at which point the goal is to focus on recruiting and enrolling more cooperative members. BBF hosted 76 unique volunteers who averaged six hours of time volunteering. Between BBF and the BEN Initiative, approximately $44,000 was spent on personnel costs during FY22, primarily between the months of

May-Nov. Seasonal employees typically spent 2-3 days per week (8 hrs./day) onsite at the Bidii Baby Foods Farm doing irrigation or harvest-related activities. The most important achievement in this KPI category is arguably the gain in certifications/permits. BBF was able to become a certified WIC Farmstand, certified farm-to-school producer, certified manufacturer in the state of NM and a certified American Indian Food. All of these channels led to increased sales options and reduced financial burden on individual families. Wholesale purchasing options not only provided the greatest amount of sales revenue, but also allowed for increased access and affordability of these products for food insecure children from low-income families.

Lastly, the overarching purpose embedded across the scorecard KPIs was the concept of achieving food sovereignty in early childhood. The FAO construes food security and nutrition as inclusive of availability, access, utilization and stability. Bidii Baby Foods (BBF) sold and donated approximately one ton of products in FY22. An analysis of direct-to-consumer and farm-to-school sales from BBFs invoices and sales records and school lunch plans indicates over 7,000 children consumed BBF products during FY22. For a small, organic family farm on the Navajo Nation, reaching 7,000 children within the first full year of operation is, by any definition, a resounding success, and will be used as a baseline expectation for upcoming seasons.

While much has been achieved this past season – particularly given the size and capacity of its current operations – Bidii Baby Foods (BBF) faces significant challenges as it seeks to address the nutritional needs of children across the Navajo Nation, where nearly one-half of the population is under the age of 18, and about 10,000 of these are under the age of five (U.S. Census Bureau, 2021b). The Navajo Nation is roughly the size of West Virginia yet, according to a 2022 study of food accessibility and driving distances, has only 14 grocery stores to serve Tribal residents. The study found that a Navajo Nation resident travels, on average, 55-65 minutes one-way to access fresh produce at a grocery store. In some extreme cases, this drive time can increase to almost 150 minutes one-way (Bennion, et al.). BBF is not inherently working to develop infrastructure or markets. However, certifications like SNAP, WIC and Farm-to-School certifications allow BBF to strategically embed products in programs that are serving low income and food insecure children in a centralized location. This reduces transportation barriers and other costs associated with consuming fresh and traditional foods. This allows for increased access to these foods in ways that are not a financial burden upon low-income families.

Crops and products produced by Bidii Baby Foods (BBF) have a high potential for utilization among the target users. Products are strategically made with crops that have been documented to have been part of the Navajo diet for generations, prior to colonization. BBF is an organic farm operation, without any use of fertilizers, pesticides, herbicides or other chemical applications. All BBF baby food products are manufactured as dehydrated products, in resealable bags to ensure longer shelf life. Because around three in ten residents on the Navajo Nation do not have consistent electricity, families are better able to utilize dehydrated products.

Bidii Baby Foods (BBF) is currently a seasonal operation. This is due to the high elevation desert climate limitations as well as spiritual guidelines for growing and preserving foods on a specific timeline. BBF typically sells out of product by the late winter/early spring and replenishes stock starting in August each year. In order to comply with spiritual guidelines and climate, BBF does not plan to increase supply chain stability by lengthening the growing season. Instead, it plans to build a cohort of young indigenous farmers and cooperative members to increase overall acreage and crop production. This will allow for increased supply, while sustaining organic and traditional indigenous agricultural and spiritual practices that maintain integrity and quality of foods produced.

In summary, operating together within a hybrid business structure, Bidii Baby Foods (BBF) and the BEN Initiative have been able to jointly work towards a mission and vision that will result in increased food sovereignty during the early childhood period on the Navajo Nation. With a hybrid model, financial risks are minimized, and work can be done on both the supply and demand sides of the food system. BBF and the BEN Initiative have completed professional development training and have acquired a number of certifications and permits that have allowed them to intriduce fresh produce and dehydrated baby food products into more strategic locations (i.e., schools, early childhood programs, etc.) via wholesale purchasing. This has resulted in a broader reach, in alignment with the target population of food insecure children from low-income homes on/near the Navajo Nation. BBF and the BEN Initiative keep food sovereignty centralized in their scorecard and overall evaluation of impact to ensure availability, access, utilization and stability are achieved and improved upon within operations.

2.7 Recommendations

Bidii Baby Foods (BBF) and the BEN leadership teams reviewed the results of the Balanced Scorecard and determined overall success for FY22. Based on that review it made the following recommendations, each designed to strengthen operations, expand reach to target populations and achieve a greater degree of food sovereignty in the upcoming fiscal year:

1. <u>Increase product sales revenue</u>.
    a. Increase wholesale revenue by 50% through fresh produce and traditional food products sales in New Mexico Grown Approved Buyer locations (schools, early childhood programs, elder care facilities and food banks).
    b. Increase direct to consumer sales by 25% through participation in events serving children under 5 years of age (i.e., early childhood conferences, birth work conferences, Intertribal Agriculture conferences, etc.).
    c. Increase direct to consumer sales by an additional 25% through onsite farmstand sales.
    d. Achieve an equitable revenue balance from sales revenue and grant revenue (i.e., $100,000 in revenue and $100,000 in grant funding). Work towards a greater input of sales revenue than grant funding.
    e. Utilize at least 50% of current and upcoming grant funding to implement conservation work to improve soil health and maximize crop diversity and production.

2. Increase customer engagement.

    a. Establish relationships and forward contracts with at least ten large wholesale New Mexico Grown Approved Buyers annually to aid in planning for harvest and manufacturing.

    b. Increase the number of repeat customers through email/text message marketing of contact information on file from original purchases and social media posts. Consider establishing a rewards program to incentivize repeat purchasing.

    c. Encourage participation in customer satisfaction surveys online via the online sales platform. Consider offering a gift card or giveaway box to randomly selected participants.

    d. Expand social following by establishing additional social media platform(s), including TikTok, Facebook, Twitter, etc.

3. Engage in strategic partnerships.

    a. Identify other local, indigenous owned businesses working to address early childhood nutrition (i.e., Tumbleweed Nutrition, Walking the Holistic Way, etc.). Host joint events or share and promote products to simultaneously uplift businesses.

    b. Host regular buyer-producer meetings across the county, Tribal nation and/or state in order to build connections with wholesale buyers in institutions serving target populations.

4. Foster innovation

    a. Develop a "Farmer-in-REZidence" farm incubator program to address the farmer shortage and build an increased supply of fresh produce and Bidii Baby Foods (BBF) products.

    b. Add two to three specialty crops to the production cycle annually.

    c. Incorporate at least one new specialty crop into the baby food product line annually.

5. Build cooperative membership.

    a. Actively recruit three to five farmers per year. Provide hands-on support and mentorship to navigate certification/permitting and inspection processes. Increase total acreage and crop yields by 100%.

6. Increase stakeholder engagement.

    a. Actively recruit volunteers through universities, service-learning programs and/or social media to increase community buy in and reduce personnel costs.

    b. Upload nonprofit tax forms annually to *GuideStar* to ensure transparency.[25]

    c. Write and share annual reports via website, *GuideStar*, social media platforms and newsletter updates.

[25] *GuideStar* is a commercial database of nonprofit organizations used by funders to verify tax-exempt status and conduct research. See https://candid.org/about

Chapter 3: Workplace Challenge – Economic Evaluation

3.1 Background

Bidii Baby Foods (BBF) is a for-profit agricultural cooperative domestically registered with the Navajo Nation. It was established in 2021, with the vision of creating a community where traditional indigenous foods are plentiful and accessible in early childhood and beyond. BBF is first and foremost a small 16-acre organic family farm that specializes in the production of indigenous crops and traditional Navajo foods. Due to infrastructural limitations on the Navajo Nation, and limited access to capital as small-scale agricultural producers, it became clear that additional means of financial investment were needed to offset start-up costs and scale to meet community needs. On the Navajo Nation, the median household income is $30,759. When living and/or farming on tribal trust land, individual land ownership cannot be achieved. With minimal economic opportunity and little-to-no assets to leverage in order to access capital, historically marginalized and young producers farming on Tribal lands are significantly disadvantaged when attempting to start agricultural businesses in a traditional model. Additionally, in communities that have undergone significant colonization and historical trauma, where traditional and cultural foods have been intentionally removed from the environment and replaced with commodity and processed foods, demand for and accessibility of locally grown, organic and traditional foods is often stifled.

The BEN Initiative operates in tandem with Bidii Baby Foods (BBF) under a joint mission, vision and purpose, and serves as a fiscal sponsor for BBF. This hybrid for-profit/nonprofit model allows for grants and donations to cover operating costs without the financial risks associated with access to credit and loan repayment. However, there are few Tribal farms operating in this capacity across the United States. Further analysis needs to be done broadly across Tribal farms to better understand financial barriers to start up and return-on-investment for both traditional business models as well as hybrid business models. Greater access to capital and credit among young/beginner and indigenous farmers can result in a greater supply of locally grown and traditional foods available in highly food insecure, rural and low-income communities.

Additionally, communities with low access to nutritious foods experience greater lifelong chronic illness. Lifelong health is impacted immediately within the first 1,000 days of life; access to safe environments, healthy relationships and nutritious foods are the foundation for living a healthy lifestyle and preventing chronic illnesses (Stanford Medicine Children's Health, 2023). Nearly one-third of all indigenous youth 2 to 19 years old are obese, with a prevalence of 20.7% for children 2 to 5 years of age (Ingalls, et al., 2019). Exposing Indigenous children to locally grown, traditional foods during the first 1,000 days of life can have protective factors that reduce the risk of experiencing overweight and obesity related issues throughout childhood, into adulthood (Schwarzenberg, et al., 2018). Early exposure to traditional foods can set taste preferences and healthy eating habits. Alternatively, experiencing obesity and nutrition-related illness during the first 5 years of life sets a trajectory for lifelong challenges with obesity and diabetes. The average cost of treating obesity related illness in childhood is $237.55/year and can range from an average of $13,000 up to $100,000 per person annually in adulthood (Healthy Diné Nation Act of 2014 (2020, as amended)).

Building a supply of locally grown and traditional food items targeted towards an early childhood population has the potential to decrease the overall cost of treating obesity related illnesses throughout the life course and have other positive social outputs on individuals and communities. This Workplace Challenge will examine the Social Return on Investment (SROI) of the combined efforts of Bidii Baby Foods (BBF) and the BEN Initiative to create a supply of locally grown and traditional foods for young children, and its potential to reduce the cost of treating obesity related illness on Navajo Nation, as well as other positive social and environmental impacts over a period of time.

3.2 Evaluation Design: Social Return on Investment (SROI)

Financial cost-benefit analysis or return-on-investment (ROI) analysis are commonly used to evaluate or estimate the strengths and weaknesses of economic activities in community-based programs. However, these methods fail to identify and measure "hard-to-monetize" values, such as social benefits. Consequently, things that can be bought and sold end up playing an outsized role when evaluating an organization. By shifting from the use of a ROI-based approach to the use of a Social Return on Investment (SROI) analysis methodology, organizations can properly capture and quantify their social benefits. One practitioner defines this methodology as

> a framework for measuring and accounting for this much broader concept of value; it seeks to reduce inequality and environmental degradation and improve wellbeing by incorporating social, environmental and economic costs and benefits. SROI measures change in ways that are relevant to the people or organizations that experience or contribute to it. It tells the story of how change

> is being created by measuring social, environmental and economic outcomes and uses monetary values to represent them. This enables a ratio of benefits to costs to be calculated. For example, a ratio of 3:1 indicates that an investment of £1 delivers £3 of social value. (Social Value UK, 2012, p.8)

There are two types of SROI analysis. The first, “Evaluative,” takes place retrospectively and is based on actual outcomes. The second, “Predictive,” is future-focused and seeks to predict the social value likely to be achieved if expected outcomes are actually achieved (Social Value UK, 2012).

SROI methodology of analysis involves six steps for its successful implementation, as follows:

1. <u>Establishing scope and identifying key stakeholders.</u> It is important to have clear boundaries about what your SROI analysis will cover, who will be involved in the process and how.
2. <u>Mapping outcomes.</u> Through engaging with your stakeholders, you will develop an impact map, or theory of change, which shows the relationship between inputs, outputs and outcomes.
3. <u>Demonstrating outcomes and giving them a value.</u> This stage involves finding data to show whether outcomes have happened and then valuing them.
4. <u>Establishing Impact.</u> Having collected proof outcomes and monetized them, those aspects of change that would have happened anyway or are a result of other factors are eliminated from consideration.

5. Calculating the SROI. This stage involves adding up all the benefits, subtracting any negatives and comparing the result to the investment. This is also where the sensitivity of the results can be tested.
6. Reporting, using and embedding. Easily forgotten, this vital last step involves sharing findings with stakeholders and responding to them, embedding good outcomes processes and verification of the report. (Social Value UK, 2012, pp.9-10)

As a component of the Johns Hopkins University "Workplace Challenge" methodology, these six steps of SROI were used to determine the predictive impact that Bidii Baby Foods (BBF) and the BEN Initiative could have on obesity related illness.

3.3 Rationale

The tie between early childhood nutrition and future health is well established. Hurley et al. (2016) found that "[p]oor nutrition (substandard diet quantity and/or quality resulting in under- or overnutrition) and the lack of early learning opportunities contribute to the loss of developmental potential and life-long health and economic disparities among millions of children aged <5 years" (p.357). Stating that "[e]arly experiences are built into our bodies, creating biological 'memories' that shape development, for better or for worse," and that "[p]hysiological disruptions can persist far into adulthood and lead to lifelong impairments both physical and mental," the Harvard University Center of the Developing Child identified three foundations of lifelong health:

1. A stable and responsive environment of relationships. These provide young children with consistent, nurturing, and protective interactions with adults, which help them develop adaptive capacities that promote learning and well-regulated stress response systems.
2. Safe and supportive physical, chemical, and built environments. These provide children with places that are free from toxins and fear, allow active and safe exploration, and offer their families opportunities to exercise and form social connections.
3. Sound and appropriate nutrition. This includes health-promoting food intake and eating habits, beginning with the future mother's preconception of nutritional status. (Harvard University, n.d.)

The need to address childhood obesity among AI/AN children has been recognized for some time. Almost twenty-five years ago, Story et al. (1999) found that "[o]besity has been increasing in all US population groups and especially in young people. Because the prevalence rates of obesity are higher in American Indians, they will probably be disproportionately affected as adults by obesity-related morbidity. Thus, there is a critical need for obesity-prevention programs targeted toward American Indian children" (p. 747S). Bullock et al. (2017), in a study of obesity among AI/AN children undertaken by the Indian Health Service (HIS), found that

> [i]n 2015, the prevalence of overweight and obesity in AI/AN children aged 2 to 19 years was 18.5% and 29.7%, respectively. Boys had higher obesity prevalence than girls (31.5% vs 27.9%). Children aged 12 to 19 years had a higher prevalence

> of overweight and obesity than younger children. The AI/AN children in our study had a higher prevalence of obesity than US children overall in the National Health and Nutrition Examination Survey [NHANES]. (p. 1502)

While many programs have been working on nutrition education projects across the Navajo Nation, few are targeted towards the early childhood (0-5 years) timeframe. Additionally, until Bidii Baby Foods (BBF) and the BEN Initiative were established during the COVID-19 pandemic, there were no organizations on the Navajo Nation working to not only increase nutrition education for families of children aged 0-5, but also building a locally grown supply of organic and traditional Navajo baby food products.

This social return on investment analysis is designed to not only examine the potential for BBF and the BEN Initiative to scale up in order to meet the potential demand of Navajo children between 0-5 years, but also determine the predictive social benefits and reduced healthcare costs of building supply and access to locally grown and traditional foods in early childhood.

3.4 Data Sources

Financial and program related data regarding Bidii Baby Foods (BBF) and the BEN Initiative operations was gathered from the FY22 financial and operational records of each organization. Public health data regarding obesity related illness was gathered from published Federal and Tribal data sources, including the US Department of Health and Human Services (HHS), the Indian Health Service (HIS) and the Navajo Nation Epidemiology Center. The Social Return on Investment (SROI) Value Map analysis template was sourced from Social Value UK (n.d.).

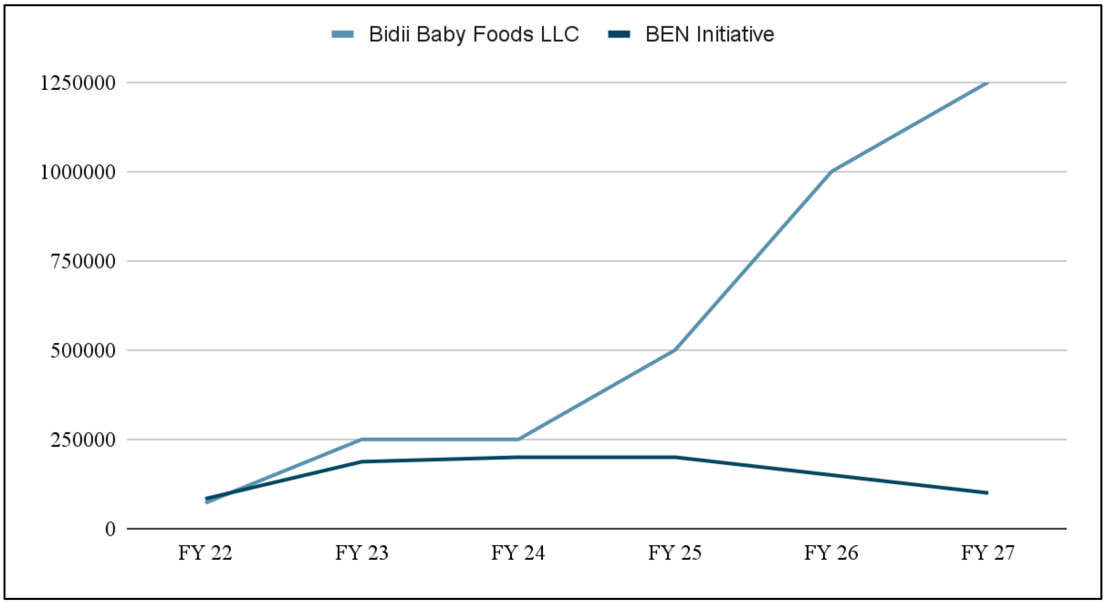
3.5 Measurement of Variables

As previously calculated in Chapter 2, Bidii Baby Foods (BBF) and the BEN Initiative enjoyed a positive return-on-investment in FY22 of 18.1% and 314.3%, respectively. With no debt or interest accruing on loans or assets, BBF and the BEN Initiative are well positioned to continue on a positive annual return on investment progression. It is envisaged that over the next five years, BBF will increase the number of farmer members selling under the cooperative, thus increasing revenue through increased acreage and produce available for sale and processing. BBF also seeks to continue using the BEN Initiative as a fiscal sponsor. This will allow it to access revenue through grant funding, thus helping offset the cost of the shared infrastructure and equipment needed to scale up community-based activities designed in increase market demand. Over time, it is anticipated that grant funding for the BEN Initiative will plateau, while revenue generated by BBF (in the form of USDA Conservation reimbursements, product/produce sales revenue and fee for services) will increase.

Over the next five years, Bidii Baby Foods (BBF) and the BEN Initiative intend to continue using the BEN Initiative as a fiscal sponsor for grants to support general operations at or below $250,000, while BBF increases revenue through increased production and sales. By FY25, BBF seeks to double its production outputs and sales revenue, reaching over $500,000. This would put the Bidii Baby Foods Farm in the USDA defined category of “mid-size” producers (generating between $350,000-$999,000 per year). It would allow for steady growth without the introduction of industrial farming equipment or techniques, while maximizing product supply to meet the growing demand being generated by the BEN Initiative efforts. By FY27, BBF seeks to reach well over $1 million in revenue in order to meet programmatic goals of serving all Navajo children under five years of age through strategic wholesale purchasing from Tribal programs and schools.

Figure 13

Bidii Baby Foods and BEN Initiative Annual Revenue For Fiscal Year (FY) 2022 and Projections For FY 2023-2027



Social Return on Investment (SROI) is calculated by dividing the present value of benefits by the total value of investment. The SROI can be adjusted for inflation and duration of the outcome and is typically compared to what would have happened had the intervention/project not taken place. SROI is outcomes-based (as opposed to outputs-based) and is stakeholder specific. SROI is denoted in monetary terms, as money is the most widely accepted form of measuring value. SROI can be calculated for future as well as past activities but is most commonly used for forecasting in the planning or scale up stages of programming/project implementation (Ashoka, 2023).

3.6 Methods & Results

3.6.1 *Establishing the scope and identifying key stakeholders*. Key stakeholders involved in the SROI analysis are identified and quantified. The number of engaged stakeholders (in FY22) as well as the estimated or projected number of stakeholders yet to engage based on current available data are also listed (Table 5). A broad range of stakeholders were identified, including program staff, volunteers, community members, purchasers, target recipients and clinicians. Bidii Baby Foods (BBF) staff and contractors who manage farm operations, product manufacturing and sales are listed first, followed by cooperative members (i.e., other local farmers who plan to sell produce and/or traditional food items through the BBF cooperative). To manage the anticipated increase in production and sales, BBF plans to increase staff by 50%, and cooperative membership by 400% over five years. Over the same period, BBF seeks to establish its own independent revenue streams to reduce, and ultimately phase out, funding received via its fiscal sponsorship with the BEN Initiative.

In FY22, 67 unique volunteers came to Bidii Baby Foods Farms, averaging about six hours of volunteer time each. To increase community engagement, it is anticipated that at least 100 unique volunteers will participate in volunteer activities. To generate local buy-in for direct-to-consumer sales and to increase connection to farming through land-based learning, at least 300 unique community members will need to attend public events on the farm (i.e., harvesting workshops, farm-to-table cooking classes, etc.).

Table 5

SROI Stakeholder Identification

Key Stakeholders	Bidii Baby Foods		BEN Initiative	
	FY2022	FY2023-2027	FY2022	FY2023-2027
Staff and Contractors	10	15	---	---
Cooperative Members	2	20	---	---
Contractors and Interns	---	---	4	---
Farm Volunteers	67	$\geq$100 (annually)	---	---
Land-Based Learning Event Participants	206	$\geq$300 (annually)	---	---
Early Childhood Wholesale Purchasers[a]	HS/PreK 1 IHS 2 HVP 2 SD 2	HS/PreK 96 IHS 8 HVP 6 SD 17	---	---
Retail (direct-to-consumer) Purchasers	121	$\geq$300 (annually)	---	---
Navajo Nation Children aged 0-5		10,543	---	---
Navajo Nation Birth Mothers, aged 15-50, w/in 12-months of giving birth		1,843	---	---
Navajo Nation Bordertown & Off-Reservation Residents[b]	30	33,370 (all ages) 20,000 (target ages)	---	---
Navajo Urban, Off-Reservation Residents	73	86,455	---	---
Navajo Area Indian Health Service (HIS) pediatric department staff[c]	3	$<$ 100 (est.)	---	---
Social Media/Website Visitors	~10,000	~50,000 (annually)	---	---

a. Head Start/PreK (HS/PreK); Indian Health Services (HIS); Home Visiting programs (HVP); School Districts (SD)
b. *Bordertown* refers to non-tribal municipalities immediately adjacent to the Navajo Nation that serve as key sites of mixed American Indian (AI) and non-AI economic activity. These include Farmington, NM; Gallup, NM; Flagstaff, AZ; Page, AZ; Winslow, AZ; Bloomfield, NM; Holbrook, AZ; Blanding, UT; Grants, NM; Cortez, CO; Durango, CO; Aztec, NM
c. Pediatricians, lactation consultants, Registered Dieticians, etc.

Due to the extremely high poverty and food insecurity rates across the Navajo Nation, Bidii Baby Foods (BBF) aims to sell products strategically through wholesale purchasers on or bordering the Navajo Nation. These include ninety-six Head Start and PreK facilities, eight Indian Health Service facilities (with pediatric departments), six Home visiting programs and seventeen school districts. These programs reach the majority of the target demographic for BBF and provide meals to children through the National School Lunch program. Nearly all families qualify for the school lunch program, which provides local food producers with an opportunity to reach the most food-vulnerable children in a way that is not only easier on supply chains, but also eliminates the cost to low-income families. That being said, BBF has an online store and participates in the Shiprock Farmers Market (the only Tribal farmers market on Navajo Nation). It is anticipated that at least 300 unique customers will be engaged in direct-to-consumer sales through these platforms annually. Families can utilize WIC Farmers Market Nutrition Program (FMNP) or SNAP Double Up Food Bucks (DUFB) benefits to pay for produce and traditional baby food products at Bidii Baby Foods Farm or at the farmer's market. Online purchasers must pay out of pocket for products and shipping costs.

Bidii Baby Foods (BBF) and the BEN Initiative aim to reach a specific target demographic of Navajo children in early childhood (0-5 years old) and their caregivers, typically men and women of childbearing age (ages 15-50). The majority of child caregivers and direct purchasers of BBF products are women; according to the US Census Bureau, there are approximately 8,883 children under five living in households on the reservation (2021b). Approximately 20,000 of Navajo border town[26] residents are of childbearing age (Navajo Division of Health, 2013, p. 22). The larger majority of off-reservation Navajo tribal members, 86,455, live in urban cities throughout the United States, but heavily concentrated in Phoenix, AZ, Albuquerque, NM, Salt Lake City, UT, and Denver, CO (Navajo Division of Health, 2013, pp. 25-26).

In FY21 and FY22, Bidii Baby Foods (BBF) and the BEN Initiative coordinated purchasing by the Indian Health Service (IHS) of BBF products through local donors and delivered those products to IHS pediatric departments. Key staff within pediatric departments implemented product distribution to the caregivers of target children at six-month checkup appointments. To sustain this over the long term will require ongoing outreach and connection to pediatric department staff, due to chronic staff turnover in IHS facilities. Key staff can include pediatricians, residents, nursing staff, lactation consultants and dieticians. Lastly, BBF has generated thousands of followers and viewers within two years of operation due to strategic social media content and website development. These platforms have the capability to increase both local community awareness as well as broader support from donors and organizations looking to elevate the work of food producers in highly food insecure areas.

3.6.2 <u>*Mapping outcomes.*</u> Below are the desired outcomes and five-year benchmarks. Three primary outcome areas include Health and Wellbeing, Environment and Supply. After first mapping outcomes with benchmarks, quantitative values were

[26] Farmington, NM; Gallup, NM; Flagstaff, AZ; Page, AZ; Winslow, AZ; Bloomfield, NM; Holbrook, AZ; Blanding, UT; Grants, NM; Cortez, CO; Durango, CO; Aztec, NM

assigned (Figure 6). First, under the Health and Wellbeing category, Improved access to locally grown, organic and traditional foods in early childhood is the first outcome identified. At the five-year benchmark, it is expected that every Navajo newborn will have access to Bidii Baby Foods (BBF) to meet nutritional needs between 4-8 months (~106 1-lb bags per child), and that every Navajo child attending PreK/Head Start programs are will be given locally grown and/or traditional foods at least once per month (12 x per year) within the National School Lunch Program (NSLP). It was estimated that children 4-8 months will require about 106 lbs. of BBF products, using Stanford Medicine Children's Health (2023) first year feeding recommendations as a guide. Additionally, the Centers for Disease Control and Prevention (CDC) (2023) recommends introducing foods to children at least 10 times in order for foods to become liked or preferred. Therefore, setting a target of feeding children under five years of age locally grown and/or traditional foods on a minimum of a monthly basis will allow for regular exposure to these foods that can increase likelihood of taste preference long term.

Second, Bidii Baby Foods (BBF) and the BEN Initiative aim to see an overall decrease in childhood obesity among children entering kindergarten. While overall Navajo Nation data appears to be somewhat inconsistent, data on San Juan and McKinley counties – which are part of the Navajo Nation – show they experience childhood obesity and childhood food insecurity at the highest rates in New Mexico, with nearly 24% of children classified as overweight or obese by the time they enter kindergarten (New Mexico Voices For Children, 2020, p. 70). With BBF and BEN Initiative intervention, it is anticipated that this rate could be reduced by 10% after five years.

Table 6

SROI Performance Outcomes and 5-Year Benchmarks (2023-2027)

Performance Outcome	5-Year Benchmark (2023-2027)
	Health and Wellbeing
Improved access to locally grown, organic and traditional foods in early childhood.	--- Every Navajo newborn has access to Bidii Baby Foods to meet nutritional needs between 4-8 months (~106 1-lb bags per child). --- Every Navajo child attending PreK/Head Start programs are given locally grown and/or traditional foods at least once per month (12 x per year) within the NSLP.
Reduced childhood obesity.	Obesity rates by the time children enter kindergarten decrease.
Increased community connection to farming through land-based learning.	--- At least 300 unique community members participate in an onsite farm event annually (i.e., planting, harvesting, farm-to-table cooking class, etc.). --- At least 100 unique volunteers participate in farm events (i.e., planting, irrigating, cultivating, harvesting).
	Environment
Regenerative agriculture practices sustain soil health for continued production.	Soil testing and USDA NRCS conservation reports show improved nutrient density in the soil compared to baseline.
Land access and water rights are improved to expand availability of locally grown and traditional foods.	All cooperative members hold Navajo Nation agricultural land use permits with quantified water rights (annual).
	Supply
Cooperative membership increases to meet growing demand of Bidii Baby Foods products and fresh produce.	--- ~100,000 lbs. of fresh produce and traditional food products are sold to early childhood wholesalers --- ~1,000 lbs. of fresh produce and traditional food products are sold direct to consumer. --- At least 100 acres of cropland is cultivated by cooperative members to meet demand.
Baby food products scale to meet demand of children age 4-12 months on Navajo Nation.	~212,000 1-lb bags of Bidii Baby Foods LLC are manufactured and distributed to cover nutritional needs of all Navajo children aged 4-12 months (106 bags per child x 2,000 children under 12 months).

Third, Bidii Baby Foods (BBF) and the BEN Initiative aim to increase community connection to farming through land-based learning. Direct connection to farming guides community members, especially children, to understand where food comes from and the differences between locally grown foods and industrial production and imported foods. BBF and the BEN Initiative intend to host at least 300 unique community members participate in an onsite farm event annually (i.e., planting, harvesting, farm-to-table cooking class, etc.).

Under the category of Environment, regenerative agriculture practices will be used to sustain soil health for continued production.[27] Without investing in sustaining and improving the soil health in our high desert climate soil, crop production will dwindle after a couple of seasons and supply will not be able to meet increasing demand. Bidii Baby Foods (BBF) will measure and monitor this through independent laboratory soil testing as well as USDA conservation planning through a local Natural Resources Conservation Service (NRCS) office. Additionally, to ensure increased viability for young indigenous farmers, cooperative members will be supported in transferring Land Use Permits (LUP) under their names. This will provide independence and security for under-35-year-old farmers looking to participate in the BBF cooperative.

Under the Supply category, cooperative membership (and acreage) must increase in order to meet growing demand. In order to meet the anticipated 101,000 lbs. of fresh produce needed to source local wholesale buyers across Navajo Nation, as

[27] *Regenerative agriculture* focuses on improving the health of soil, which has been degraded by the use of heavy machinery, fertilizers and pesticides in intensive farming. See https://www.weforum.org/agenda/2022/10/what-is-regenerative-agriculture/

well as the 212,000 lbs. of dehydrated baby foods for Navajo children under 12 months, a minimum of 100 acres of cropland in active production annually will be needed under the Bidii Baby Foods (BBF) cooperative.

3.6.3 *Demonstrating outcomes and giving them a value.* In Table 8, below, identified benchmarks were assigned quantitative values and proxies for measurement in order to apply into a SROI calculation. For each outcome/benchmark identified, a quantitative value has been assigned along with possible proxies for measurement. In order to serve all estimated Navajo children under the age of twelve months with a supply of Bidii Baby Foods (BBF) products sufficient to feed babies (in tandem with breastfeeding and/or formula feeding) between the 4–12-month period, approximately 212,000 lbs. of products would need to be grown and manufactured. Additionally, fresh produce needed to serve the approximately 8,000 children under five years of age attending Head Start/PreK programs on a monthly basis will require 96,000 lbs. of produce. At a current market value price of $2/lb. this would yield approximately $192,000 in sales. Dehydrated baby food product and fresh produce sales will be tracked through harvest and traceability logbooks as well as sales invoicing.

Studies indicates that the yearly per capita healthcare costs associated with overweight and obese children is $238 (Ling et al, 2023). Currently, about 50% of Navajo children under 18 are diagnosed as overweight or obese. If providing children with locally grown and traditional foods in early childhood helps to prevent them from becoming overweight and obese throughout the entirety of their childhood (up to age 17), this could result in a total healthcare cost savings of almost $43 million.

Table 7

SROI Performance Benchmarks/Outcomes: Quantitative Values & Proxy Variables

Performance Benchmark/Outcomes: Quantitative Values & Proxy Variables/Performance Benchmarks/Outcomes	Quantitative Value	Proxy Variable(s)
Every Navajo newborn has access to Bidii Baby Foods to meet nutritional needs between 4-8 months (~106 1-lb bags per child).	106 1-lb bags of Bidii Baby Foods products * 2000 children under 12 months = 212,000.	--- Current Market Value --- Harvest logs
Every Navajo child attending PreK/Head Start programs are given locally grown and/or traditional foods at least once per month (12 x per year) within the NSLP.	$2/lb. of produce x 8,000 children x 12 months = $192,000.	--- Traceability logs --- Square Online Invoicing
Obesity rates by the time children enter kindergarten decrease.	$238 * 17 years * 10,543 Navajo children under 5 = $42,576,324 cost savings.	--- US Census/ Navajo Nation MCH survey data --- State (NM/AZ) and/or county level data
At least 300 unique community members participate in an onsite farm event annually (i.e. planting, harvesting, farm-to-table cooking class, etc.).	300 unique visitors * 3 hours (average) = 900 hours of land-based learning.	Event participation logs. Photos
At least 100 unique volunteers participate in farm events (i.e. planting, irrigating, cultivating, harvesting).	100 unique volunteers * 6 hours (average) = 600 hours land-based volunteer learning.	--- Volunteer logs --- Photos
Soil testing and USDA NRCS conservation reports show improved nutrient density in the soil compared to baseline.	Maximum soil nutrient density results in the highest yield of produce, ideally at minimum 5,000 lbs. of fresh produce and 3,000 lbs. of value-added product per 5 acres.	--- NRCS Conservation plan (annual) --- Independent laboratory test results (annual).
All cooperative members hold Navajo Nation agricultural land use permits with quantified water rights (annual).	Up to 20 land use permits are recorded under cooperative membership.	Land Use Permits (LUP) submitted with cooperative membership application.

Table 7, cont.

Performance Benchmarks/Outcomes: Quantitative Values & Proxy Variables

Performance Benchmarks/Outcomes	Quantitative Value	Proxy Variable
~96,000 lbs of fresh produce and traditional food products are sold to early childhood wholesalers.	96,000lbs * $2/lb = $192,000.	--- Current Market Value --- Harvest logs --- Traceability Logs --- Square Online Invoicing.
~1,000 lbs. of fresh produce and traditional food products are sold direct to consumer.	1,000lbs * $2/lb. = $2,000	--- Current Market Value --- Harvest log --- Traceability Logs --- Square Online Invoicing
At least 100 acres of cropland is cultivated by cooperative members to meet demand.	96,000 lbs./ 5 acres per cooperative member = 20 cooperative members needed to cultivate acreage to meet demand. *Land use permits are leases from the federal government and are not paid for by tribal members.	--- Land value in states Navajo Nation resides in (NM, AZ, UT)
~212,000 1-lb bags of Bidii Baby Foods LLC are manufactured and distributed to cover nutritional needs of all Navajo children aged 4-12 months (106 bags per child x 2,000 children under 12 months).	212,000 bags * $10/bag = $2,120,000.	--- Current Market Value --- Harvest logs --- Traceability logs --- Square Online Invoicing

Generating reconnection with local foods requires exposure to land-based learning. Hosting onsite events and volunteer opportunities for local community members, student groups, etc. to see local and traditional foods being grown and processed can help increase connection to these foods as well as demand. This will be tracked through volunteer logs, event sign in sheets and photos. It is estimated to cost $6,500 annually to support these activities.

Growing in high elevation desert climates comes with its own set of challenges, including poor soil quality, low water retention, low access to water for irrigation, erosion, etc. In order to sustain and improve soil health to meet the growing demand of local foods and baby food products, Bidii Baby Foods (BBF) plans to work under the USDA Environmental Quality Incentives Program (EQIP)[28] conservation program to conduct annual soil testing and soil health improvement applications, including composting, cover cropping and crop rotation. This will be documented through soil testing from an independent laboratory as well as semi-annual conservation plan evaluations from USDA.

In order to expand cooperative membership, combined acreage and crop yield, farmers must have access to land. When farming on Tribal Trust land, land ownership is not possible. Trust land is leased from the federal government and is typically passed down to family members in the form of Agricultural Land Use Permits (LUP) on the Navajo Nation. The norm is for family elders to hold the land in their name, which can create issues for young indigenous farmers. Young farmers often face family members who offer land use (without Land Use Permit transfers) in exchange for some monetary agreement. This process is technically illegal, but common practice with little to no government enforcement on Navajo Nation. Bidii Baby Foods (BBF) will support young indigenous farmers with the official transfer of documentation to indigenous youth farmers as part of the cooperative membership process. The average size of an Agricultural Land Use Permit (LUP) on the Navajo Nation is about ten acres (Raymond & Falk, 2018). BBF will need at least twenty cooperative members, each with a minimum of five acres, to meet the anticipated demand of scale up for Navajo children under

[28] See https://www.nrcs.usda.gov/programs-initiatives/eqip-environmental-quality-incentives

twelve, wholesale school lunch providers for early childhood programs and direct to consumer sales.

In summary, when considering the cost of maintaining and building out necessary infrastructure on Tribal Trust agricultural land, recruiting cooperative membership and staffing Bidii Baby Foods (BBF) and the BEN Initiative to scale and meet the proposed demand, it is estimated to cost just over $1 million.

3.6.4 *Establishing impact. "*Deadweight" is a measure of the amount of outcome that would have happened even if the activity had not taken place (Social Value UK, 2012). In this case, Bidii Baby Foods (BBF) is the only farm-to-school certified producer on Navajo Nation, as well as the only active indigenous baby food producer in the United States. There are no competitors or other local producers working on these project objectives, and therefore the specific activity would not take place without BBF. Deadweight can be measured, however, by the food security rate across Navajo Nation. The Navajo Nation experiences food insecurity at the highest rate in the United States at 76.7% (Pardilla et al, 2014). This means that only 23.3% of homes are considered food secure. If we assume that only 23.3% of homes are considered food secure and thus have access to sufficient quantities and varieties of foods, this could be considered deadweight, i.e., the food security status on the Navajo Nation in the absence of any interventions by BBF.

In addition to Deadweight, it is important to calculate Attribution, which is defined as how much of the outcome was caused by the contribution of other organizations or people. "Attribution is calculated as the proportion of the outcome that is attributable to your organization. It shows the part of deadweight for which you have better information and where you can attribute outcome to other people or organizations. It will never be possible to get a completely accurate assessment of attribution" (Social Value UK, 2012). At this stage, it is important to consider ways in which the project/activity may not be the only contributing factor to change being observed. While Bidii Baby Foods (BBF) is the only certified farm to school producer who could implement an increased supply of locally grown and traditional foods within facilities and programs that serve children 0-5 years of age, there are still a number of independent farmers on the Navajo Nation who exclusively sell direct to consumer. Improved nutritional outcomes (reduced overweight and obesity rates) in children by the time they enter kindergarten could potentially be partially attributed to access to fresh and traditional produce at local farms, flea markets and farmers markets on the Navajo Nation. In future years, the amount of outcome is likely to be less or, if the same, will be more likely to be influenced by other factors, so attribution to your organization is lower. (Social Value UK, 2021).

Lastly, once Deadweight and Attribution are identified, Drop-off is calculated to account for reduced outputs, and is only calculated for outcomes that last more than one year. Drop-off is usually calculated by deducting a fixed percentage from the remaining level of outcome at the end of each year (Social Value UK, 2012). Bidii Baby Foods (BBF) will apply a standard 5% Drop-off rate for external stakeholders. Deadweight, Attribution and Drop-off are estimates, based on best judgment or standard percentages.

3.6.5 <u>*Calculating the SROI.*</u> Appendix D outlines the associated costs of programming for selected outcomes, using a "value map" template developed by Social Value UK. In summary, the cost of land and infrastructure needed by Bidii Baby Foods and contractors to scale up operations to meet increasing demand over five years is anticipated to be at least $154,000. An additional $925,000 is needed for the BEN Initiative to provide fiscal sponsorship and support Bidii Baby Foods (BBF) in this scaling up. Farm volunteers and visitors for land-based learning events will cost just over $30,000. Product sales, in total -- inclusive of early childhood program wholesale purchasers, direct to consumer sales (through Navajo Nation WIC/SNAP) and early education and childcare program purchasers -- would cost approximately $6.5 million over the five years to scale up and meet the goal of feeding all 4-12 month old babies a full supply of traditional baby food products, and children aged 1-5 at least 1 lb of locally grown produce in school lunch meals.

The Social Return on Investment (SROI) determines the ratio between the benefits of program implementation compared to the program costs. The equation used to calculate SROI is:

SROI = Net program benefits (per person social costs - costs per success)/program costs

After identifying the total costs for each outcome associated with each identified stakeholder across years 0-5, the net value of the program costs was $7,696,380. This means that when operational costs for Bidii Baby Foods (BBF), including cooperative members; the BEN Initiative; community members; volunteers and product sales costs were combined across the anticipated five years of scale up, $7,696,380 would be required to achieve the outcomes. If all enrolled Navajo children between 0-5 years of age have access to BBF products for all meals during the 4-12 months age range, as well as 1 lb. of produce in meals monthly between 0-5 years of age, it is hypothesized that overweight and obesity related health costs could be mitigated throughout childhood, and beyond. If the cost of treating children 0-5 with overweight and obesity related health issues (u=~10,000 annually) is estimated to cost $238 per year, then it would cost approximately $21,288,162 to treat throughout childhood (up to age 17). This yields a social return on investment (SROI) ratio of 2.8:1, meaning that every $1 investment in BBF/BEN Initiative programming to ensure access to locally grown and traditional foods during the early childhood period yields about $3 gain in healthcare cost savings related to treating childhood overweight and obesity related issues throughout childhood.

3.6.6 *Returning, using and embedding.* Bidii Baby Foods (BBF) received an initial investment of $40,000 from the Navajo Nation during the Covid-19 pandemic designed to help sustain domestically registered small businesses. Other than this initial investment, the Navajo Nation has not provided any grant funding, nor have they procured fresh produce or traditional food products from BBF. The majority of investments have come from state and private philanthropic donors. Given the high healthcare costs and the long-term impact that overweight and obesity related health issues have on enrolled tribal members as well as the local economy, it is in the best interest of the Navajo Nation to invest more in BBF to help scale operations and increase procurement of products within tribal programs serving young children between 0-5 years of age. Sharing these findings strategically with offices within the Navajo Nation Tribal government is critical in order to achieve the proposed outcomes. Offices of importance include the Navajo Nation Office of the President and Vice President, Office of Economic Development, Office of Head Start, Office of Special Education and Rehabilitation Services and the Navajo Nation Department of Agriculture.

3.7 Summary

As an emerging agricultural cooperative on a Tribal nation, Bidii Baby Foods (BBF) and the BEN Initiative work hand-in-hand to not only create positive financial outcomes, but also to accomplish a greater socially-driven mission of improving food sovereignty, food security and nutrition in early childhood and beyond. Foods that children are exposed to during the first 1,000 days of life have a lasting impact on a child's relationship with food, including taste preferences, portion sizing, metabolism, etc. An investment in early childhood nutrition can have a positive impact on long term health outcomes, including decreased overweight and obesity related chronic illness. Federal and Tribal monies are typically spent on treatment of overweight and obesity related chronic illnesses, starting in childhood and increasing in cost and duration into adulthood. Few dollars are allocated for prevention programming or local agricultural production of indigenous crops and traditional foods. A social return on investment analysis shows that money spent on scaling the agricultural production of BBF/BEN Initiative to meet the nutritional needs of Navajo children aged 0-5 years could result in a 2.8:1 return. Results could extend into adulthood, thus further increasing the social return on investment.

Chapter 4: Workplace Challenge – Plan for New Program

4.1 Background

In Chapters 2 and 3, a Balanced Scorecard and social return on investment (SROI) analysis were used to evaluate the organizational strengths and limitations of the Bidii Baby Foods (BBF) and the BEN Initiative hybrid for-profit/nonprofit structure, as well as the social impact of strategic traditional food production and early childhood supply chain on Navajo Nation. These evaluations identified a clear need to scale up operations in order to meet the growing demand among Navajo children under 5 years old. A minimum of one hundred acres of productive cropland will be needed in order to meet the demand for fresh produce and traditional baby food production. Agricultural land on the Navajo Nation cannot be owned or purchased; it is Tribal Trust land and is typically divided up and leased to enrolled members of the Navajo Nation through the local tribal government in each chapter community. Currently, the average acreage per Agricultural Land Use Permit (LUP) is about ten acres (Raymond & Falk, 2018). Therefore, BBF will need a minimum of 20 cooperative farmer members to participate in crop production and sales to the identified early childhood buyers/stakeholders to successfully meet the increasing demand.

In FY22, Bidii Baby Foods (BBF) had two cooperative members. Over the course of five years, BBF will need to recruit at least four new cooperative members each year in order to achieve its target production and distribution goals (for serving Navajo children 0-5 years of age) with a very low portion of Tribal members working in farming or agriculture. With the Navajo Nation also experiencing poverty at one of highest rates in the country, access to capital and technical skills training to navigate the complexity of agricultural production in rural/tribal communities is often out of reach. Due to these limitations, BBF and the BEN Initiative have strategically and uniquely positioned the organizations to best address these issues through what I call a “Farmer-in-REZidence” farmer incubator/training program. In this chapter, I outline the new program objectives and their significance on the Navajo Nation. I conduct a literature review to identify current best-practices and guidance on new/beginner farmer mentorship programs, and I develop Program Planning, Implementation and Evaluation tools for the “Farmer-in-REZidence” program.

4.2 Program Objectives

Objectives for the “Farmer-in-REZidence” program include:

1. Identify at least four new/beginning, under-35 indigenous farmers to complete the program annually.
2. Provide technical skills training and direct farmer mentorship to program participants.
3. Provide access to land onsite at Bidii Baby Foods Farm during year of program participation; provide legal support to complete identification and transfer of Agricultural Land Use Permits (LPU) into the name of program participants upon completion of and transition out of the program.

4. Provide access to shared equipment including heavy machinery (i.e. tractor), implements, irrigation equipment, farm tools and Personal Protective Equipment (PPE).

4.3 Significance

According to the USDA *2017 Census of Agriculture* (Appendix B), the total market value of products sold on the Navajo Nation is about $87,652,600; however, the Farm production expenses are $163,161,600. The average market value of products sold per farm is $5,435, with 74% of farms generating less than $1,000 per year off of product sales. Fifty-three percent of Navajo women participate in agricultural production (n=14,126). Additionally, the majority of farmers and LUP holders are over the age of 65, with only 7.7% of farmers under the age of 35. 80.6% are considered experienced farmers, farming on their LUP land for over 10 years, with 19.4% farming for less than 10 years.

Sustainable agriculture is considered to be one of the most urgently needed forms of work in the United States. Current agricultural production in the United States is primarily large-scale, industrial farming operated by generational farmers who are increasing in age. As legacy farmers seek to retire, the next generation of producers need the capacity to provide food, feed, fuel and fiber to a growing population. However, young producers (under 35) account for only 9% of US producers. Carisle et al. highlight the challenges unique to young farmer/producers:

> In order to farm, new farmers must build up and sustain productive *assets* that enable them to grow crops or raise livestock and bring these products to market.

> These assets include, at a minimum, land, water, equipment, inputs, labor, and knowledge (or skills and information). New farmers also need social networks to transmit knowledge, pool resources, and lower the transaction costs of farmer-to-farmer collaboration. Some assets are physical, others are socio-economic, and others are cognitive or experience based. (2019, p. 5, emphasis in original)

Sethuratnam (2021) argues that "[t]raditionally, farming knowledge was transferred from generation to generation, and intergenerational knowledge transfer was critical to farming. With the slow decline of the family farm as a rural institution, and rapid rural-urban migration, especially among youth, this form of knowledge transfer is now at a very low level" (p. 151). In addition to lack of mentorship and shared knowledge, young farmers are also having to find ways to secure assets like land and heavy equipment due to the lack of familial transfer. Young/beginner "farmers adapt to these access barriers in a variety of ways, like renting less than suitable land in residential areas, supplementing farm revenues with off-farm income, and establishing novel and niche consumer chains" (Minkoff-Zern & Sloat, 2017). These adaptations can help farmers break even on expenses put into their farm, but ultimately these are temporary solutions that will not result in sustainable, scaled or profitable farming.

Assistance is needed for young, beginner farmers because, as Carlisle et al. point out

> New farmers do not necessarily have the economic power, social connections or credit-gaining capacity to garner access and use it – largely due to longstanding inequities in the US agricultural system. Well-designed assistance can not only

> help individual farmers but can also begin to transform existing political-economic structures into an enabling environment for new entry sustainable farmer. (2019)

Young and beginner farmers can develop successful agricultural business models with limited access to capital and established infrastructure. One way of doing this is through shared resources. Assets do not need to be owned privately by each farmer. Young and beginner farmers need access to assets, which is often best achieved through collectively owned assets among a group of farmers, a cooperative or a rural community. Farm cooperatives are well positioned to develop and implement successful incubators for young and beginner farmers and provide the administrative structure to house capital, land and market access. As the USDA explains:

> Co-ops are producer- and user-owned businesses that are controlled by -- and operate for the benefit of -- their members, rather than outside investors. The co-op business model is highly flexible and can address a wide variety of needs. Farmer-owned co-ops help producer-members market and process their crops and livestock, and secure needed production supplies and services. (U.S. Department of Agriculture, n.d.)

Cooperatives can pool resources to cover upfront and large expenses needed to start farming, such as shared equipment, infrastructure and liability/crop insurance. Cooperatives can provide direct peer-to-peer learning and host technical experts for skills training. Cooperatives can also solicit feedback from member farmers to engage in local, state or federal policy and advocacy work in order to recommend changes on behalf of a larger collective of farmers, rather than independent farmers. This collectivist approach to farming is inherently an indigenous approach; however, this approach is not supported or encouraged within the industrial agricultural paradigm. In a recent study, Franzen (2017) found that historically marginalized farmers (i.e. Black, Indigenous, Hispanic, etc.) are "often behind their white counterparts due to lack of capital, resulting in an inability to create value-added products, withstand unforeseen circumstances, or own their means of production" (p. 79). Franzan went on to say that farming is about passion and freedom, and less about status or wealth; social, economic and political agendas were not typically part of the independent African American farmer agenda. Likewise in Indigenous communities, which are often even more isolated and rural, farming is a means of ceremony, community and food sovereignty, rather than an economic livelihood or social status.

4.4 Literature Review & Analysis

4.4.1 Literature Review Methodology

I conducted a scoping review of recently published academic and gray literature to determine the best-practices and key components of new/beginner farmer incubator/training programs with the goal of identifying best practices to inform the development of a new "Farmer-in-REZidence" program within Bidii Baby Foods. The need for farmer training has been recognized – and reflected in the literature -- since the establishment of the New Deal in the 1930s, and the increased demand for domestic food production during World War II. However, as Lelekacs et al. (2014) found, '[t]he terminology 'incubator farm' is fairly new and still somewhat variable in meaning" (p. 1).

I used agricultural databases to identify literature, including AGRICOLA, AGRIS and AgEcon Search. Due to the lack of a common and agreed upon taxonomy defining farmer training programming, I used multiple search terms and phrases.

AGRICOLA is a comprehensive database run by the United States Department of Agriculture. The search terms “incubator farms,” “incubator farm” and “farmer incubator” yielded only two results.

AGRIS is a database run by the United Nations Food and Agriculture Office (FAO) and contains over 14 million records, including 4,251 datasets from nearly 500 agricultural data providers. Search terms “incubator farm” yielded two results and “farmer incubator” yielded two additional unique results.

AgEcon Search, developed and maintained by the Department of Applied Economics at the University of Minnesota, collects, indexes, and electronically distributes full text copies of scholarly research in the broadly defined field of agricultural economics, including sub disciplines such as agribusiness, food supply, natural resource economics, environmental economics, policy issues, agricultural trade, and economic development. AgEcon Search terms “farmer-in-residence” yielded zero articles, “incubator farms” yielded two results and “farm incubator” yielded four results.

Given the very limited literature on the topic of farmer incubator/training programs in these specialized databases, I used the less topic-specialized Google Scholar for a more general literature search. The Google Scholar search term “farm incubator” yielded 371 hits, and “incubator farm” yielded 182 results. Of the total 565 articles identified, articles were eliminated from review if farmer incubator/training were not the inherent focus of the article (i.e., if a farmer incubator program was only briefly mentioned/referenced in the article or referenced out of context, e.g., farm incubators for baby chicks) or if they were published prior to 2013. Articles and case studies of farmer incubator programs serving rural, tribal and/or Black, Indigenous and People of Color (BIPOC) communities were prioritized. This resulted in 20 articles selected for in-depth review. Results of the literature review show farmer incubator/training programs tended to focus on "knowledge deficit" interventions to attempt to resolve new/beginner farmer challenges. These deficits tend to fall within a variety of skill and knowledge areas, such as technical skills training (i.e., agronomic, entrepreneurial/business, marketing, financial, farm safety and natural resource management); curriculum development; land access; farmland transfer and policy-advocacy.

4.4.2 *Literature Review Findings and Analysis*

The Food, Conservation, and Energy Act of 2008[29] established the USDA Beginner Farmer and Rancher Development Program (BFRDP). Funding over the years, including the most recent provided in the Agriculture Improvement Act of 2018 (aka the 2018 Farm Bill)[30] has supported farm incubator programs implementing these interventions. However, many programs focusing primarily or exclusively on technical skills ("new knowledge") training found that program participants were not successful in implementing their farms after transitioning out of the program. Knowledge deficit

[29] Pub. L. No. 110-234, Section 7410
[30] Pub. L. No. 115-334

training is not sufficient for new/beginner and historically marginalized farmers. Other barriers exist. In their case study of farmworkers seeking to take up independent farming in California’s Central Coast region, Calo and De Master (2016) found that

> well-intended efforts to facilitate the…aims of helping former farm-workers transition to proprietorship may face limited success if various land access barriers are not addressed structurally. In this particular case study analysis, beginning farmers face substantial social and structural barriers to land access, in spite of benefitting from robust agricultural training and myriad business and operational supports. (p. 125)

In a separate examination of knowledge deficits themselves and their failure to resolve the challenges faced by beginning farmers, Calo (2018) found that

> [f]or institutions working on supporting beginning farmers in their regions, it is worth considering the extent to which providing new knowledge remedies the specific challenges their constituents face. Without doing so, the result may be creating a new resource pool that is essentially inaccessible to the farmers that face barriers structural in nature. (p. 337)

Indigenous farmers may be at the greatest disadvantage due to structural barriers such as lack of land ownership on tribal trust land, lack of quantified water rights, lack of access to capital and low socioeconomic status.

Indigenous-led cooperatives located within Tribal Trust lands are best positioned to implement farmer incubator programs for young/beginner indigenous farmers. Farmer incubator programs are typically led by agricultural colleges and special programs with inherently academic experience and knowledge transfer (Calo, 2018). Indigenous-led cooperatives have lived experience navigating structural barriers to successfully establish a farm on tribal lands and create a livelihood from agricultural production. Information developed into curricula within Indigenous-led cooperatives and farmer incubator programs will be more specific to local challenges and systemic barriers, thus leading to improved outcomes of the program. One study of incubator farms found that

> [a]s part of the alternative to the conventional food system, incubator farms are not just about creating closer connections between a community and a food source but also among the producers; they create a community of growers. Their proximity to one another as they farm one parcel of land gives the beginning farmers access to both knowledge and physical resources they might not otherwise have. (Ewert, 2012, p. 23)

In an examination and analysis by Lelekacs et al. (2014) of ten existing farmer incubator programs, and a National Incubator Farm Training Initiative (NIFTI) review of twelve case studies (New Entry Sustainable Farming Project, n.d.), several trends in standard components of farmer incubator programs were identified. Components included:

- Curriculum
- Infrastructure
- Access to Land
- Markets

- Participation/Transition
- Project Management
- Communication
- Defining Success/Evaluation

Each incubator farm examined used a variety of formal curricula and informal teaching methodologies. Some chose to require classroom time, utilizing educational materials from the USDA, local universities or extension programs. Others put the impetus on the program participants to self-identify needs, which were then discussed with experienced farmers. Many programs utilized experienced farmer mentors to provide 1:1 coaching and support to new/beginner farmers. Curricula content included topics related to farm business planning, management structures, farm financing and a variety of technical agronomic skills topics.

Nearly all programs supporting new/beginner farmers identified access to infrastructure as a critical component of successful farm incubator programs. Even small-scale operations (annual income <$250,000, under 40 acres) can require hundreds of thousands of dollars of heavy equipment and farm infrastructure. These expenses, along with access to land, are the greatest barriers to starting, maintaining and scaling small farm production. Cooperatives are well positioned to be able to use their organizational structure and grant funding to procure equipment and other infrastructure that can be shared/rented among cooperative members and/or new/beginner farmers participating in farmer incubator programs.

Access to land is a consistent challenge faced by farmers across the United States, as well as the Navajo Nation. A lack of land access disproportionately impacts historically marginalized farmers (African American, Indigenous, Hispanic) as well as women farmers and young/beginner farmers. Indigenous farmers face additional barriers in land access. If Navajo farmers want to farm within their tribal communities (as opposed to off-reservation private cropland), there is no way to obtain land ownership. Tribal trust land is leased to tribal nations from the United States government. The Navajo Nation specifically implements their own processes for assigning Agricultural Land Use Permits (LUP) for land use. As identified by Shoemaker (2017), LUPs can be assigned or removed arbitrarily, and do not provide land users with ownership that could be leveraged to access capital. Infrastructure investments are risky on tribal trust land due to the non-permanent nature of the LUP. Additionally, LUPs are often not regulated, which allows for LUP holders to have land assigned in their names regardless of agricultural production, as confirmed by Raymond & Falk (2018). This reduces the ability of young indigenous farmers to access land.

Once land and infrastructure are obtained and technical skills are sufficient for production, new/beginner farmers must then be able to identify markets in which to conduct sales. Farmer incubator programs often provide support in identifying local farmers markets or development of branding/marketing for direct to consumer or community supported agriculture (CSA) purchasing programs. Depending on mission and demographics of target consumers, some farmer incubator programs offered training on programs like SNAP Double Up Food Bucks (DUFB)[31] or WIC Farmers Market Nutrition Program (FMNP)[32], which provide supplemental income for fresh and locally grown foods to low-income families. Farmer incubator programs can also consider training/mentorship on farm-to-school certification, to include wholesale school purchasers in a new/beginner farmer's buying options. It was clear that having a variety of markets in which to sell products (i.e., direct to consumer, CSA, wholesale, etc.) provides the new/beginner farmer with the greatest return on investment.

Farmer incubator programs also had a broad range of participation requirements and transition planning. For young/beginner farmers, programs typically capped age requirements between 18-35 years old (often to meet compliance with the USDA's definition of "young farmer," if that was their primary source of funding). The length of a program ranged from 1-5 years, typically with increasing costs associated with the number of years of participation. For example, year 1 would consist primarily of training and direct mentorship or volunteer hour requirements to offset costs of participation. In years 2-3, participants would be allotted land within the farm incubator plot and would be required to pay for seeds, pay for water use, rent equipment and/or rent land. Expenses would be partially offset through the farm incubator's funding sources in

[31] The *Double Up Food Bucks* program doubles the value of federal nutrition (SNAP or food stamps) benefits spent at participating markets and grocery stores. See U.S. Department of Agriculture, Double Up National Network, *SNAP-Ed Connection*. https://snaped.fns.usda.gov/library/materials/double-national-network

[32] The *WIC Farmers' Market Nutrition Program (FMNP)* is associated with the Special Supplemental Nutrition Program for Women, Infants and Children (WIC). Eligible WIC participants are issued FMNP coupons in addition to their regular WIC benefits. These coupons can be used to buy eligible foods from farmers, farmers' markets or roadside stands that have been approved by the state agency to accept FMNP coupons. See https://www.fns.usda.gov/fmnp/wic-farmers-market-nutrition-program

earlier years of participation and would scale back to allow program participants to fund expenses in later years of participation. The concept behind this approach is to create a safe environment for learning that has low financial risk for the program participant. Over time, as they become confident in their capacity to produce crops and participate in increasing sales, they slowly learn how to budget to cover necessary expenses. Once program participants have reached their time limit in participation, they are supported in their transition out of the program. Farmer incubator programs can provide support by helping to identify cropland, capital investments and low-cost equipment (shared or used) to sustain progress upon transitioning out of the program. Some farmer incubator programs are also engaged in policy and advocacy work to help bring awareness to the structural barriers faced by new/beginner and historically marginalized farmers, in hopes of affecting legislation and funding that could better support them.

Farmer incubator programs ranged in project management approaches. Most programs had a similar application process, requiring a written application as well as an in-person interview to determine if the goals of the applicant aligned with the anticipated program outcomes. Some Farmer incubator programs provided stipends to help offset transportation or other administrative costs. Some farmer incubator programs provided onsite housing for non-local participants, or intentionally recruited local community-based participants to ensure proximity to the farm. Programs typically hosted 2-3 program participants at a time and strategically used hands-on training as an additional opportunity for free/reduced cost labor. Once enrolled, program participants signed agreements annually to comply with that year's requirements. In earlier years, program participants agreed to more training and mentorship, while in later years program participants agreed to finance various portions of their activities within the farmer incubator program.

Establishing communication expectations was identified as another important component of a successful farmer incubator program. Most programs established weekly or monthly meetings with program participants, outside of standard programing. Meeting times were used to discuss progress towards goals and additional support needed at various stages of the program. Programs offering direct peer mentorship with experienced farmers encouraged weekly or bi-weekly communication 1:1 between the mentor and the program participant. Emails and virtual communication can be used, particularly during off season.

Lastly, evaluation within independent farm operations is often on the backburner. Due to the nature of small-scale farming, owners are often wearing multiple hats and have a broad range of tasks to complete including hands-on farm work, administration, fundraising, human resources, payroll, etc. Documentation and evaluation efforts are usually limited in small scale farming operations, and it is often difficult to determine success of programs. Farmer incubator programs have broad definitions for success, but typically include things like dedication or pride in growing cultural foods; increasing accessibility of (culturally appropriate) foods; pride in entrepreneurship; and increased income and land stewardship. Farmer incubator programs have evaluated program participants' achievements of these successes through pre/post surveys, qualitative interviews and photos/photovoice methods.

In summary, the literature on farmer incubator programs serving new/beginner and historically marginalized farmers identified needs for programs to not only focus on knowledge deficit training, but to gain insights directly from program participants into the perceived or experienced structural barriers in new farm development and incorporate recommendations into programming. Sharing information in a variety of forms through formal classroom instruction, guest speakers and direct mentorship with experienced farmers (of similar demographic background and lived experience) increased applicability of information shared. Additionally, addressing structural barriers by providing access to land, infrastructure and capital through a cooperative, collective structure both during the program and after transition appears to have the greatest impact on long term success for new/beginner and historically marginalized farmers. Overall, it is clear from the literature that despite new/beginner and historically marginalized farmers having common challenges, there is no "cookie cutter approach" to solving them. Localized solutions led by members (farmers) of the community who have lived experience successfully navigating structural barriers see the greatest long-term impact on program participants.

4.5 Conceptual Framework

The development by Bidii Baby Foods (BBF) and the BEN Initiative of its "Farmer-in-REZidence" incubator/training program is influenced by the "theory of change" put forth by Lelekacs et al. (2014) in their study of ten incubator farm programs across the country:

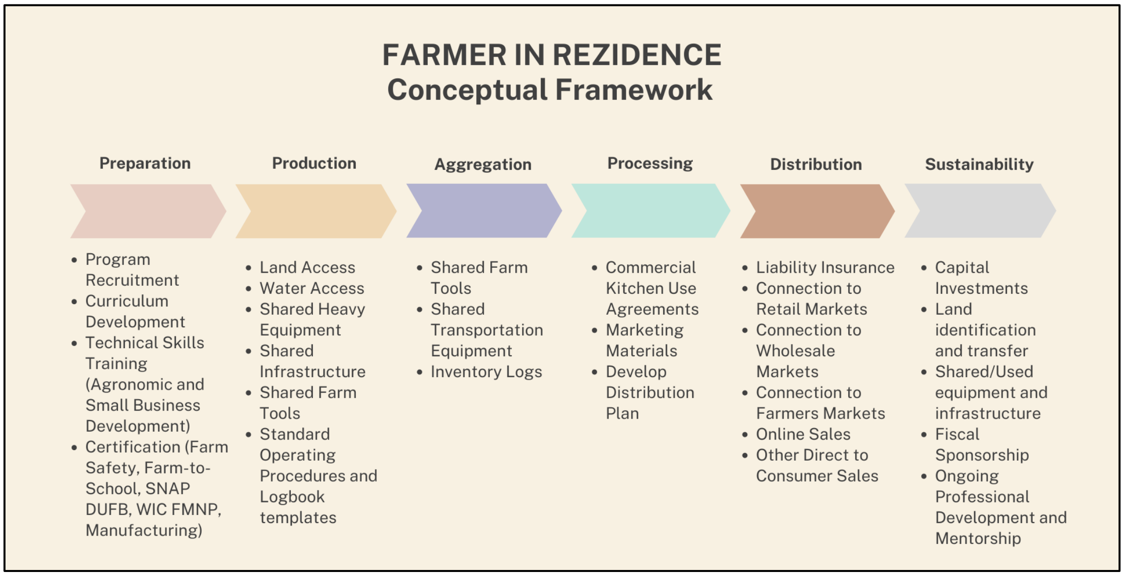
> The theory of change behind incubator farm development is: By providing opportunities for new farmers to access land, develop the skill set and experience essential to run a successful farm, and help developing a business plan, these farmers have a better chance of securing capital, accessing their own land, and ultimately being successful in achieving their farm business goals. (p. 2)

By creating a nurturing environment for new/beginner Indigenous farmers to obtain skills and experience to run a successful farm, while simultaneously identifying and addressing the structural barriers faced by those farmers, the BBF/BEN Initiative "Farmer-in-REZidence" incubator/training program is designed to help farmers have a greater likelihood of establishing and sustaining successful farm businesses and achieving food sovereignty among rural, Indigenous children (0-5) and their families. The conceptual framework for the program is organized into six phases: Preparation, Production, Aggregation, Processing, Distribution and Sustainability (Figure 12).

During the Preparation phase, program participants and mentors are recruited. Bidii Baby Foods develops curriculum topics and schedules a variety of technical skills training during the off-season, leading up to production. Technical skills training includes a range of agronomic topics specific to traditional Indigenous agricultural techniques and current organic and regenerative agriculture practices to maximize soil health and crop production simultaneously. Technical training also includes business development

Figure 14

"Farmer-in-Residence" Conceptual Framework



training tailored for new/beginner and historically marginalized farmers including access to capital, business structures, taxes, accounting practices, farm safety and standard operating procedures. During the Preparation phase program participants also learn about various programs that they can become certified in to improve operations and increase market sales options, including Farm Safety Training (leading to USDA Good Agricultural Practices certification), Farm-to-School certification, WIC Farmers Market Nutrition Program (FMNP) and SNAP Double Up Food Bucks (DUFB) supplemental assistance programs, and Manufacturing permits for value added products.

During the Production phase, program participants are provided up to three acres of cropland with water access on Bidii Baby Foods Farm. Shared heavy equipment, infrastructure and tools are available onsite for program participants, thus addressing some of the primary structural barriers among new/beginner and historically marginalized farmers and reducing initial investment costs and financial risk. While farming on BBF farmland, program participants are required to adhere to BBF Standard Operating Procedures(SOP) and are provided templates of procedures and farm logs to implement production, aggregation and distribution tracking and evaluation.

During the Aggregation and Processing phases, shared farm tools and transportation equipment are available to gather and transport agricultural products to a centralized location where they can be cleaned and packaged for distribution. Inventory logs (including harvest and traceability logs) templates are provided to program participants to adapt to meet their needs and implement throughout the productive season. Bidii Baby Foods (BBF) provides guidance on marketing materials and allows program participants to sell directly to the BBF cooperative, in which case agricultural products will be marketed with BBF packaging. Distribution plans and forward contracts with wholesale and retail markets can be established as early as the production phase, often 2-3 months prior to harvest. This allows farmers to plant with confidence, knowing they will be able to sell their produce and reduce food waste and time spent selling in smaller markets. Program participants are supported to register as vendors with local farmers markets and engage direct-to-consumer at in-person markets or online through the Square Online e-commerce platform.

Lastly, during the Sustainability phase, Bidii Baby Foods (BBF) aims to ensure long term success of the time and resources already invested into program participants. Sharing opportunities for capital investment and offering to use the BEN Initiative tax-exempt status as a fiscal sponsor reduces financial risk and burden on new/beginner and historically marginalized farmers. Upon successful completion of the program, farmers have access to use the BEN Initiative as a fiscal sponsor for a capped 5% administration fee. BBF also ensures that upon completion of the program, all farmers have access to land (either private or tribal trust land) by helping farmers identify and negotiate with current land holders. Farmers who complete the program can continue to use shared equipment by paying to rent and transport the equipment to their farm site. Farmers will be invited to quarterly meetings with BBF/BEN Initiative to provide updates on progress. Farmers are encouraged to maintain relationships with their mentors and step into the role of being a mentor for new program participants in future seasons.

4.6 Program Design

Appendix E outlines a Project Timeline for the Farmer-in-REZidence program. The project timeline provides a visual work plan for completing each of the six phases of the program, with specific outputs for each phase. The Farmer-in-REZidence program is strategically designed to include standard components of farmer incubator programs while simultaneously addressing structural barriers that frequently prevent graduates from these programs succeeding long term. Bidii Baby Foods (BBF) and the BEN Initiative are uniquely positioned to lead this effort on the Navajo Nation for several reasons. BBF/BEN Initiative leadership, staff and governing board identify as Indigenous women and are under 35 years old; they are from and/or rooted in the community served by the program and are very familiar with tribal and state political processes and jurisdictional challenges. Bidii Baby Foods Farm is located on tribal trust land and is the only farm and agricultural cooperative on the Navajo Nation that is currently certified to sell farm-to-school; accept SNAP and WIC as payment; and conduct manufacturing operations for value-added products. As a Federally recognized tax-exempt organization, BEN acts as a fiscal sponsor on behalf of BBF and obtains capital investments for infrastructure/equipment, personnel and community engagement projects.

Components of the Farmer-in-REZidence program were determined from both academic recommendations as well as lived experience. A scoping literature review identified foundational elements of farmer incubator programs and highlighted areas that present challenges for long term success. Lived experience and connection to the local community being served is an additional strength for the BBF/BEN leadership team. BBF/BEN Initiative started the farm from the ground up, and through lived experience have the knowledge to navigate structural barriers at local, tribal and state levels in order to successfully manage a farm and maximize return on investment and profitability. Compared to case studies of other farmer incubator programs whose curriculum and design are more academic or theoretical, lived experience from a leadership team and farm business actively navigating structural barriers can result in more long-term success.

The foundational components of the Farmer-in-REZidence program include technical skills training, business development training, direct mentorship, land/water access, shared equipment and infrastructure, marketing support and distribution support. Bidii Baby Foods/BEN Initiative staff provide unique perspectives in each of these components based on lived experience as farmers and food producers based on Navajo Nation trust land. BBF/BEN Initiative also recognizes the need for sustainability planning to ensure long term success and therefore incorporate a number of additional supports for program participants, upon completion of the program. Program graduates will receive invitations to quarterly team meetings with staff and mentors as well as free professional development opportunities hosted both internally and externally. The BBF/BEN Initiative will ensure program graduates identify and complete land transfer (permit or ownership) prior to the start of the next farm season. Graduates will have continued access to shared equipment for a discounted rental rate. Plus, graduates are eligible to utilize the BEN Initiative as a fiscal agent for funding they are looking to secure for their operations. BEN Initiative staff will offer to include graduate operations in applicable grant applications and will serve as a fiscal agent with minimal administrative fees (5%) for grants the graduate is applying for independently. Continued access to capital, land/water access, shared equipment and mentorship provide a pathway for continued success upon completion of the Farmer-in-REZidence program.

4.7 Program Implementation Plan

At the beginning of each fiscal year, starting January 2024, public announcement and recruitment efforts to identify program participants, along with experienced farmer mentors, will commence. Bidii Baby Foods (BBF)/BEN Initiative staff will be finalizing materials and training schedules included in the curriculum. Technical agronomic and business development training will start in February, requiring 3-6 hours per week through the end of March. BBF/BEN Initiative staff will provide templates and hands-on support to program participants in developing standard operating procedures and

Figure 15

"Farmer-In-REZidence" Process Map

logbooks for various elements of production, aggregation, processing and distribution. Production will commence in April, in alignment with the traditional Navajo farming cycles and seasonal spring growing season. Program participants will have access to land, water and shared equipment, infrastructure and tools. During production down time, program participants will work on marketing materials and strategies for the upcoming distribution phase. They will also meet with local retail and wholesale buyers and establish forward contracts for their products.

Aggregation and processing will begin in mid-to-late July as crops mature. Contracts will be established for program participants to clean, package and store produce and value-added products at local commercial kitchen facilities. Distribution will start in August and run through

November for fresh produce, and through the entirety of the year into the following year for any dehydrated value-added packaged products.

Once harvest has been completed, typically in late October, program participants will have time to focus on distributing their remaining products, closing down their farm plots and planning for the following season. Bidii Baby Foods (BBF)/BEN Initiative will provide support in identifying and transferring land (via Navajo Nation agricultural land use permits or private ownership) to program participants between November and December. Program Participants will have ongoing support upon completion of the program. They may apply to become BBF cooperative members or may start their own farm business as a separate entity. All successful graduates will have indefinite perks of shared resources and fiscal sponsorship, as needed, including shared equipment, infrastructure and tools (for reduced cost renting) and fiscal sponsorship to access capital at a reduced administrative fee of 5%.

Success of the Farmer-in-Rezidence program will be determined by several metrics, including:

- Completion of all training and mentorship components outlined in the curriculum.
- Production of a minimum of one acre of cropland.
- Completed sales in at least one retail market, one wholesale market and one direct-to-consumer market.
- Identification of land to be used in the upcoming season upon graduation.
- Overall increase in knowledge and satisfaction in program outputs.

These metrics will be evaluated through attendance tracking sheets, photovoice (photos of cropland cultivated and qualitative narrative), accounting sales records, land use permit or bill of sale for land transfer and pre/post knowledge and satisfaction survey results.

4.8 Summary

Farmer incubator programs are commonly composed of core foundational components, including curriculum, infrastructure, access to land, markets, participation/transition, project management, communication and defining success/evaluation. Challenges often faced by farmer incubator programs include addressing structural barriers that limit long term success, including sustained access to land, water and infrastructure/equipment. Access to capital among historically marginalized and young farmers is notably inequitable. Community-based cooperative models, especially those with a Federally recognized tax-exempt status, are well positioned to host farmer incubator programs and address structural barriers to long term success and profitability through unique solutions rooted in lived experience. Bidii Baby Foods (BBF)/BEN Initiative have a representative leadership team and comprehensive business structure to address all farmer incubator program components and solutions to structural barriers through this proposed Farmer-in-REZidence program.

Chapter 5: Workplace Challenge – Discussion of Implications

5.1 Strengths & Limitations

This Workplace Challenge dissertation revealed several strengths. First, the development of a scorecard offered flexibility in the evaluation to fit the unique needs of the hybrid for-profit/nonprofit model, allowing for indicators from both organizations to be reviewed together, rather than as separate entities. Balanced Scorecards provide flexibility for organizations to establish an overarching vision and purpose under which all categories should be evaluated (as opposed to standard outputs of organizational or financial growth). The Balanced Scorecard categories and indicators within each category were determined jointly by Bidii Baby Foods (BBF) leadership and BEN Initiative Board of Directors. Results of the scorecard were also reviewed by this joint leadership team to determine overall success for FY22 and to set goals for future fiscal years.

Second, the social return on investment (SROI) analysis allowed for Bidii Baby Foods (BBF) and the BEN Initiative to determine the costs of scaling up to serve all Navajo children aged 0-5 years in a capacity that could set new trajectories for childhood nutrition and associated health outcomes. By comparing this cost with the current cost of treating childhood overweight and obesity related health issues, it was clear that the cost of investing in local agriculture and production of traditional foods would result in an overall cost savings but could also have the potential for sustained long term health outcomes throughout childhood and into adulthood. The results of this analysis could be shared with local, tribal and state leadership to advocate for policy change and increased capital to scale these efforts.

There were also a number of limitations that arose during this Workplace Challenge. Bidii Baby Foods (BBF) and the BEN Initiative are relatively new organizations with a small workforce. FY22 was the first full year of operation for the organizations, and therefore financial and programmatic data to include in this evaluation were limited. Additionally, being located in the Navajo Nation, access to tribal data is limited. Oftentimes, external evaluators, including the US Census Bureau, can only provide estimates (often with a large margin of error), which may not be the most accurate or up-to-date data to help guide programming. Literature review publications were also limited due to the small pool of included articles. Farmer incubator programs are relatively novel approaches to increasing the agricultural workforce due to the shifting need to focus more on supporting new/beginner farmers rather than intergenerational and established farmers. The majority of literature reviewed identified structural barriers (like accessing capital, land, water, etc.) as common challenges of new/beginner farmers, which farmer incubator programs have not been completely successful in addressing.

5.2 Role of Leadership in Organizational Challenges

Bidii Baby Foods (BBF) is overseen by sole owner Zachariah Ben. It currently has no financial shareholders, however it considers cooperative members to be key stakeholders in operations, under an Indigenous collectivist structure. Therefore, BBF aims to share findings from this Workplace Challenge with all current and future cooperative members. Findings will be discussed and potential solutions to organizational challenges and/or programmatic goals will be identified.

The BEN Initiative is governed by an Indigenous-led Board of Directors who meet quarterly to review financial, operational and programmatic functions of the organization. Results of the analyses done in this Workplace Challenge will be reviewed by the board members at an upcoming board meeting, where application of recommendations will be incorporated into current and upcoming programming.

Jointly, a brief document summarizing key findings from this Workplace Challenge will be developed by BEN Initiative staff and disseminated to key stakeholders, including local tribal and state representatives and elected officials, current and potential funders, other agricultural producers on Navajo Nation and community members. It will also be available on the BBF website and posted on social media platforms.

5.3 Potential Implications for Management

While Bidii Baby Foods (BBF) and the BEN Initiative are working collaboratively to achieve a joint mission, each have inherently different capabilities as a for-profit and a nonprofit entity and focus on building supply and demand simultaneously. BBF is a for-profit entity registered with the Navajo Nation as a domestic agricultural cooperative. It strives to grow a supply of organic indigenous crops, manufacture traditional foods and market them specifically for the early childhood period (age 0-5). The BEN Initiative was established to serve as a fiscal sponsor, as it now is doing for BBF, and has helped secure funding to support the infrastructure growth, general operations and community engagement activities that will build demand for BBF agricultural products.

In this Workplace Challenge, a lofty goal was set in the social return on investment (SROI) analysis to serve all Navajo children 0-5 years of age with a complete package of locally grown, organic and traditional baby food products, as well as monthly produce incorporated into school/early childhood program lunches, within the next 5 years. This will require the addition of 100 acres of cropland and approximately 20 additional cooperative farmer members in order to achieve the level of crop production needed to serve the target population. This will be demanding for Bidii Baby Food's (BBF) current leadership structure. Additional management and staff will be needed to support the growing cooperative farmer members with aggregation, production and processing.

Additionally, the BEN Initiative leadership will need to maintain their current budget and ideally acquire local, state, tribal or federal funding that specifically supports the financial areas in which Bidii Baby Foods (BBF) will need help most. This includes line items like heavy (shared) equipment, agricultural infrastructure, personnel (with benefits) costs, professional development, and administrative/overhead costs. The BEN Initiative is able to generate financial and operational security to support the growth of BBF and increased production of agricultural products through grant and donation funding, which in turn provides greater profitability and productivity to BBF.

Lastly, while this Workplace Challenge was able to identify key components of farmer incubator programs, as well as structural barriers commonly faced by new/beginner and historically marginalized farmers, there was no data in any of the articles reviewed specifically regarding farmer incubator programs on tribal nations or serving Indigenous farmers. Without specificity to the unique needs of Indigenous farmers farming on tribal trust lands, there is risk that the proposed Farmer-in-REZidence program may not fit the needs of new/beginner Indigenous farmers. Bidii Baby Foods (BBF) and BEN Initiative leadership should be aware of this limitation and continue to seek information on programs serving these populations in the future to incorporate into the Farmer-in-REZidence program.

5.4 Policy Implications

Bidii Baby Foods (BBF) and the BEN Initiative are established as two separate entities in order to maximize resources, limit loss and financial risk and build up both supply and demand of locally grown and traditional foods. This hybrid model was developed after Bidii Baby Foods (BBF) was established, due to the fact that, as a tribally registered business, it could not qualify for certain grant funding and other resources. Most federal and state funding, as well as some private and philanthropic donors, cannot provide grant funding or donations to a for-profit corporation. Additionally, federal grant funding requires the applicant to register with the U.S. government and obtain a "Unique Entity ID" in order to access the online application platform.[33] However, the applicant registration process does not accept business identification numbers assigned by the Navajo Nation to domestic corporations like BBF.[34] It became clear early on that the cost to establish a farm and scale up production would significantly exceed the sales revenue, particularly during the first few years of

[33] See www.SAM.gov
[34] For examples of required registrant information see https://www.fsd.gov/sys_attachment.do?sys_id=70d349981b43655006b09796bc4bcbf7

operation. The Navajo Nation Department of Agriculture primarily supports ranching operations, providing an average of $500 of support to individual “gardeners and farmers” in a given fiscal year. Other than one-time Covid-19 relief money, the tribe has not allocated money in their operations budgets to support the development and scale up of locally, domestically registered farms.

After projecting anticipated costs of scale up to meet the potential social demand for locally grown and traditional foods, it is clear that The BEN Initiative is best situated to continue acting as a fiscal sponsor for Bidii Baby Foods (BBF) for at least the next five years. Grant revenue has been and will continue to be used for shared equipment, infrastructure, transportation, personnel and other miscellaneous scale up costs, while simultaneously BBF builds sales revenue to sustain and grow the operation further. This hybrid cooperative model can be influential on future policy and advocacy work on the Navajo Nation. BBF and the BEN Initiative have the opportunity to work with the newly elected Navajo Nation government and provide evidence of a model that works to not only increase a significant supply of local foods for early childhood, but also maximizes resources through multi-government support (tribal, state, federal). BBF can provide recommendations for the Navajo Nation Department of Agriculture, in order to shift away from only funding cash crops and ranching to more support for sustainable and traditional agricultural ventures seeking to increase local food supply. Given BBF’s status as farm-to-school certified producers, we can also provide Navajo Nation leadership with recommendations for creating a farm-to-school certification process on tribal lands, as well as product manufacturing and processing.

Bidii Baby Foods (BBF) has received multiple grants and awards from the state of New Mexico. The state is very interested in supporting small farms, but at times has challenges moving funds to programs based on tribal trust lands. Not wanting to jeopardize government-to-government relationships, some funding opportunities are foregone given the complexity of jurisdictional issues. As a nonprofit organization registered in the State of New Mexico, using the BEN Initiative as its fiscal sponsor helps BBF navigate these issues and successfully receive grant funding. Recommending state business/nonprofit registration in addition to or in place of tribal registration could be options for increasing funding among young, beginner and tribal farmers.

Bidii Baby Foods (BBF) and the BEN Initiative's work also applies to federal policy. The 2023 Farm Bill[35] is up before the U.S. Congress, and leadership from BBF was invited to participate in the Native Farm Bill Coalition's gathering in Washington, DC in May 2023. At the gathering, we shared our challenges accessing federal funding as a tribal business, and concerns about the Farm Bill primarily providing support for industrial farming. BBF provided input and contextualized recommendations on the Native Farm Bill Coalition's Gaining Ground report to Congress, advocating for funding streams that can reach small, regenerative and traditional farmers across Indian Country.[36]

More work needs to be done across all levels–federal, tribal and state–in order to address significant structural barriers faced by young, beginner and tribal farmers.

[35] See U.S. House of Representative, Committee on Agriculture. https://agriculture.house.gov/

[36] Native Farm Bill Coalition, *Gaining Ground: A Report on the 2018 Farm Bill Successes for Indian Country and Opportunities for 2023*. https://www.nativefarmbill.com/_files/ugd/8b3589_763e8879ac2842c0baa45c586ddfd83a.pdf

Bidii Baby Foods (BBF) and the BEN Initiative offer a model by which debt is limited, excess revenue is maximized, and traditional foods are grown, processed and embedded within local systems to minimize cost to low-income families. Expanding and replicating this model can increase food sovereignty and accessibility in rural and tribal communities.

5.5 Generalizability

While some of the issues discussed in this dissertation are specific to Navajo Nation and/or farming in high elevation desert climates, many tribal nations across the United States face similar circumstances. Indigenous peoples residing on tribal lands often live well below the national poverty rate and have limited access to land, capital and other infrastructure to develop an agricultural operation. A hybrid business model, wherein two arms are developed to allow for both sales revenue and grant revenue generation, offers greater financial benefits to historically marginalized and young, beginner farmers. This model can be replicated in other tribal communities in order to leverage resources from states where tribal nations overlap, within their own tribal government or within the federal government.

According to the most recent USDA Census of Agriculture (2017), The majority of farming operations in the United States are industrial, most of which are owned and operated by White producers (U.S. Department of Agriculture, 2017c). As Jett (2020) points out, this has been the case since the establishment of the United States, leaving historically marginalized farmers often without land, equipment and capital to pursue agricultural businesses. With climate change, reduction in generational farming, damages within the industrial model and increasing dependence on importation of food has come a realization within federal and state governments that more resources must be made available to small to mid-scale producers farming with regenerative practices, as well as historically marginalized and new/beginner farmers. These resources are more commonly being made available at state and federal levels. Tribal nations and independent farmers on tribal trust lands are eligible to apply for these resources (as well as technical assistance during the application process). Having established entities within tribal communities as well as within states will allow for historically marginalized, young and new/beginner farmers to maximize profitability and reduce risk. Additionally, providing incubator programs that are specifically tailored to the needs of these populations will result in the greatest success.

5.6 Organizational Resources Available

Bidii Baby Foods (BBF) and the BEN Initiative have utilized a number of resources to support organizational development and growth. As previously mentioned, The BEN Initiative acts as a fiscal sponsor for BBF and has leveraged hundreds of thousands of dollars in grant revenue from private/philanthropic, state and federal funders to support the development and expansion of farming operations; many of these grant makers have expressed interest in providing continued, multi-year funding. The BEN Initiative plans to continue acting as the fiscal sponsor for BBF over the next 2-5 years until BBF's capacity to serve its target populations has been reached, and BBF is able to financially support operations solely off of sales revenue. BBF has also utilized Roanhorse

Consulting, a native woman led business development organization, to consult on organizational structure and development.

The Navajo Nation has a number of offices designed to support agriculture and business development, including the Navajo Nation Department of Economic Development, Navajo Nation Department of Agriculture, “Big Navajo” USDA/NRCS offices, Soil and Water District Office and Regional Business Development Offices (RBDOs). Bidii Baby Foods (BBF) has attempted to collaborate with these offices several times since its establishment, however, has had limited engagement and support due to office closures (perhaps due to their lack of staff) and little or no budgets available. BBF continues to maintain basic contact with these entities and provide feedback on better ways to collaborate in the future.

Bidii Baby Foods (BBF) participates in a number of local coalitions and working groups including the New Mexico Grown Coalition, Healthy Soils Working Group and the Shiprock Food Access Coalition. These groups provide networking opportunities to build sales and community engagement. BBF has also hosted a number of school programs with universities from the Navajo Nation and Four Corners states. Leadership from these schools have offered additional support and have invited BBF to academic and professional networking events and continue to be an organizational resource.

Lastly, Bidii Baby Foods (BBF) has strong relationships with local commercial kitchen operations as well as school food buyers. These connections have led to free/reduced cost use of commercial kitchens for product manufacturing, as well as increased sales among food banks and local schools and early childhood programs.

Conclusion

Bidii Baby Foods (BBF) and the BEN Initiative established a hybrid business model to build a supply of locally grown and traditional foods and demand for these foods among community members and early childhood serving programs/providers. Through the use of a Balanced Scorecard, BBF and BEN leadership identified key performance indicators and determined impact and areas of improvement. A social return on investment analysis provided BBF and the BEN Initiative with data to support greater investment in the operation, resulting in cost savings associated with preventing overweight and obesity related issues. Planning for a Farmer-in-REZidence program identified best practices within farmer incubator programs as well as common structural barriers faced by new/beginner and historically marginalized farmers. Overall, the potential for social impact and improvement/achievement of food sovereignty in early childhood shows good return and scalability/generalizability to other indigenous populations. Hybrid business models are especially ideal for new/beginner and historically marginalized farmers as they are able to offset high startup costs and maximize profitability. And farmer incubator programs that provide solutions to structural barriers (i.e. access to land, water, capital) show the greatest potential to support new/beginner and historically marginalized farmers have long term success in agricultural production.

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References

Abdul, M., Ingabire, A., Lam, C. Y. N., Bennett, B., Menzel, K., MacKenzie-Shalders, K., & van Herwerden, L. (2023). Indigenous food sovereignty assessment -- A systematic literature review. *Nutrition & Dietetics: The Journal of the Dietitians Association of Australia*, *2*, 1-16. https://doi.org/10.1111/1747-0080.12813

Arizona et al. v. Navajo Nation et al. 599 U.S. ___ (2023). https://www.supremecourt.gov/opinions/22pdf/21-1484_aplc.pdf

Ashoka (2023*). Social Return on Investment: Everything You Wanted to Know in 30 Seconds*. Ashoka. https://www.ashoka.org/en-us/story/social-return-investment-everything-you-wanted-know-30-seconds

Becenti, A. (2021). Diné enrolled population increases to 399,494. *Navajo Times*. https://navajotimes.com/reznews/dine-enrolled-population-increases-to-399494/

Bell, S., Deen, J. F., Fuentes, M., Moore, K., COMMITTEE ON NATIVE AMERICAN CHILD HEALTH, Calac, D., Empey, A., Nadeau, K., Oski, J., Thierry, J., & Weedn, A. (2021). Caring for American Indian and Alaska Native Children and Adolescents [Policy Statement]. *Pediatrics*, *147*(4), 1-12. https://doi.org/10.1542/peds.2021-050498

Bennion, N., Redelfs, A. H., Spruance, L., Benally, S., & Sloan-Aagard, C. (2022). Driving Distance and Food Accessibility: A Geospatial Analysis of the Food Environment in the Navajo Nation and Border Towns. *Frontiers in Nutrition*, *9*, 904119. https://doi.org/10.3389/fnut.2022.904119

Bidii Baby Foods (2023). *Our Vision and Mission*. https://www.bidiibabyfoods.org/

Bourne, M., Mills, J., Wilcox, M., Neely, A., and Platts, K. (2000). Designing, implementing and updating performance measurement systems. *International Journal of Operations and Production Management*, *20*(7), p.757. https://doi.org/10.1108/01443570010330739

Bullock, A., Sheff, K., Moore, K., & Manson, S. (2017). Obesity and Overweight in American Indian and Alaska Native Children, 2006–2015. *American Journal of Public Health*, *107*(9), 1502–1507. https://doi.org/10.2105/AJPH.2017.303904

Calo, A. (2018). How knowledge deficit interventions fail to resolve beginning farmer challenges. *Agriculture and Human Values*, *35*(2), 367–381. Scopus. https://doi.org/10.1007/s10460-017-9832-6

Calo, A. & De Master, K (2016). After the Incubator: Factors Impeding Land Access Along the Path from Farmworker to Proprietor. *Journal of Agriculture, Food Systems, and Community Development*, *6*(2), 111-12. https://www.foodsystemsjournal.org/index.php/fsj/article/view/451

Carlisle, L., de Wit, M. M., DeLonge, M. S., Calo, A., Getz, C., Ory, J., Munden-Dixon, K., Galt, R., Melone, B., Knox, R., Iles, A., & Press, D. (2019). Securing the future of US agriculture: The case for investing in new entry sustainable farmers. *Elementa: Science of the Anthropocene*, *7(*17). https://doi.org/10.1525/elementa.356

Centers for Disease Control and Prevention (CDC) (2022, June). *Infant Mortality*. Reproductive Health. https://www.cdc.gov/reproductivehealth/maternalinfanthealth/infantmortality.htm#mortality

Centers for Disease Control and Prevention (CDC) (2023, April). *FAQs*. Nutrition, Infant and Toddler Nutrition. https://www.cdc.gov/nutrition/infantandtoddlernutrition/faqs.html

Chiang, K. V. (2021). Racial and Ethnic Disparities in Breastfeeding Initiation – United States, 2019. *MMWR. Morbidity and Mortality Weekly Report*, *70*. https://doi.org/10.15585/mmwr.mm7021a1

Community Outreach and Patient Empowerment (COPE) (2016). *2016 Annual Report*. https://docs.wixstatic.com/ugd/0dcff4_a60b0d198df7453c8d61a316a3400d57.pdf

Dillinger L, S. C. J., Martha J. Macri, Louis E. Grivetti, Teresa. (1999). Feast or famine? Supplemental food programs and their impacts on two American Indian communities in California. *International Journal of Food Sciences and Nutrition*, *50*(3), 173–187. https://doi.org/10.1080/096374899101210

Dine College (2023). *Academics: B.S. Agriculture*. https://www.dinecollege.edu/academics/b-s-agriculture/

Diné Policy Institute. (2014, April). Diné Food Sovereignty: A Report on the Navajo Nation Food System and the Case to Rebuild a Self-Sufficient Food System for the Diné People. https://www.dinecollege.edu/wp-content/uploads/2018/04/dpi-food-sovereignty-report.pdf

Diné Policy Institute (2018). *Land Reform in the Navajo Nation: Possibilities of Renewal For Our People*. Native Agriculture Research and Reports. https://www.firstnations.org/publications/land-reform-in-the-navajo-nation-possibilities-of-renewal-for-our-people/

Ewert, B.M. (2012). *Understanding Incubator Farms: Innovative Programs in New Farmer Development.*[Master's thesis, University of Montana]. https://scholarworks.umt.edu/etd/1146

First Nations Development Institute (2018). *Indian Country Food Price Index: Exploring Variation in Food Pricing Across Native Communities, A Working Paper II.* Native Agriculture & Food Systems Initiative*.* https://www.firstnations.org/publications/indian-country-food-price-index-exploring-variation-in-food-pricing-across-native-communities-a-working-paper-ii/

Fleszar, L. G., Bryant, A. S., Johnson, C. O., Blacker, B. F., Aravkin, A., Baumann, M., Dwyer-Lindgren, L., Kelly, Y. O., Maass, K., Zheng, P., & Roth, G. A. (2023). Trends in State-Level Maternal Mortality by Racial and Ethnic Group in the United States. *JAMA*, *330*(1), 52–61. https://doi.org/10.1001/jama.2023.9043

Frank, L.E. (2021, Nov.). *History on a Plate: How Native American Diets Shifted After European Colonization*. History. https://www.history.com/news/native-american-food-shifts

Franzen, S. (2017). Reality education: Agricultural knowledge exchange in the U.S. South. J*ournal of Agriculture, Food Systems, and Community Development*, 7(2), 69–83. http://dx.doi.org/10.5304/jafscd.2017.072.013

George, C., Bancroft, C., Salt, S. K., Curley, C. S., Curley, C., Heer, H. D. de, Yazzie, D., Eddie, R., Antone-Nez, R., & Shin, S. S. (2021a). Changes in food pricing and availability on the Navajo Nation following a 2% tax on unhealthy foods: The Healthy Diné Nation Act of 2014. *PLOS ONE*, *16*(9). https://doi.org/10.1371/journal.pone.0256683

George, C., Bancroft, C., Salt, S., Curley, C., Curley, C., Eddie, R., Edison, T., de Heer, H., Sanderson, P. R., Yazzie, D., Antone-Nez, R., & Shin, S. (2021b). Successful implementation of the Healthy Diné Nation Act in stores on the Navajo Nation. *Preventive Medicine Reports*, *24*. https://doi.org/10.1016/j.pmedr.2021.101573

Harvard Business School (2020, May). How to Calculate ROI to Justify a Project. https://online.hbs.edu/blog/post/how-to-calculate-roi-for-a-project

Harvard University (n.d.). *Why Children's Health is the Foundation of Lifelong Health*. Lifelong Health. Center of the Developing Child, https://developingchild.harvard.edu/science/deep-dives/lifelong-health/

Healthy Diné Nation Act of 2014, Title 24, Navajo Nation Code, Chapter 11, §1001. https://tax.navajo-nsn.gov/Navajo%20Taxes/Statutes/HDNA%20of%202014%20as%20amended%20by%20CD-96-20.pdf

Healthy Diné Nation Act of 2014 (2020, as amended), Title 24, Navajo Nation Code, Chapter 11, §1101. https://tax.navajo-nsn.gov/Navajo%20Taxes/Statutes/HDNA%20of%202014%20as%20amended%20by%20CD-96-20.pdf

Hurley, K. M., Yousafzai, A. K., & Lopez-Boo, F. (2016). Early Child Development and Nutrition: A Review of the Benefits and Challenges of Implementing Integrated Interventions. *Advances in Nutrition (Bethesda, Md.)*, *7*(2), 357–363. https://doi.org/10.3945/an.115.010363

Indian Health Service (IHS) (2019, Oct.). Disparities. *Fact Sheets*. https://www.ihs.gov/newsroom/factsheets/disparities/

Ingalls, A., Rosenstock, S., Foy Cuddy, R., Neault, N., Yessilth, S., Goklish, N., Nelson, L., Reid, R., & Barlow, A. (2019). Family Spirit Nurture (FSN) – a randomized controlled trial to prevent early childhood obesity in American Indian populations: Trial rationale and study protocol. *BMC Obesity*, *6*(1), Article 1. https://doi.org/10.1186/s40608-019-0233-9

Jernigan, V. B. B., Huyser, K. R., Valdes, J., & Simonds, V. W. (2017). Food Insecurity Among American Indians and Alaska Natives: A National Profile Using the Current Population Survey–Food Security Supplement. *Journal of Hunger & Environmental Nutrition*, *12*(1), 1–10. https://doi.org/10.1080/19320248.2016.1227750

Jett, T. R. (2020). *Fighting for Farming Justice: Diversity, Food Access and the USDA*. Routledge. https://doi.org/10.4324/9780429401053

Kaplan, R.S. (2001). "Strategic Performance Measurement and Management in Nonprofit Organizations." Nonprofit Management and Leadership 11, 353–370

Kaplan, R.S. (2020). *Conceptual Foundations of the Balanced Scorecard. Working paper 10-07*4. *Harvard Business School, Harvard University*. http://www.hbs.edu/research/pdf/10-074.pdf

Kaplan, R.S. and Norton, D.P. (1992) The Balanced Scorecard: Measures that Drive Performance, *Harvard Business Review*,70(1), (January-February): 71-79.

Kaplan, R.S. & Norton, D.P. (1996a). Linking the balanced scorecard to strategy. *California. Manage. Rev*., 39(1): 53-79.

Kaplan, R.S. & Norton, D.P. (1996b). *The Balanced Scorecard: Translating Strategy into Action*. Harvard Business School Press.

Kelly, L. C. (1970). *Navajo roundup; selected correspondence of Kit Carson's expedition against the Navajo, 1863-1865*. Pruett Pub. Co. http://archive.org/details/navajoroundupsel0000kell

La Via Campesina. (2023, Jan). *Food Sovereignty | Explained.* https://viacampesina.org/en/food-sovereignty/

Lee, M., Walker, J., Dorsey, C., & Battilana, J. (2012). In Search of the Hybrid Ideal. *Stanford Social Innovation Review*, *10*(3), 51–55. https://doi.org/10.48558/WF5M-8Q69

Lelekacs, J. M., O'Sullivan, J., Morris, M., & Creamer, N. (2014). Incubator Farms as Beginning Farmer Support. *The Journal of Extension*, *52*(1), Article 9. https://tigerprints.clemson.edu/joe/vol52/iss1/9

Ling, J., Chen S., Zahry, N.R., & Kao, T.A. (2023). Economic burden of childhood overweight and obesity: A systematic review and meta-analysis. *Obes Rev.*, *Feb*;*24*(2). doi.org/10.1111/obr.13535.

Minkoff-Zern, L.-A., & Sloat, S. (2017). A new era of civil rights? Latino immigrant farmers and exclusion at the United States Department of Agriculture. *Agriculture and Human Values*, *34*(3), 631–643. https://doi.org/10.1007/s10460-016-9756-6

Navajo Nation Department of Agriculture (n.d., a). *Mission Statement.* https://agriculture.navajo-nsn.gov/Home

Navajo Nation Department of Agriculture (n.d., b). *Farm & Garden Incentive Program*. https://agriculture.navajo-nsn.gov/Farm-Garden-Incentive

Navajo Department of Health (2016). *Navajo Epidemiology Center Update, Volume 1 , May 2016*. Navajo Epidemiology Center. https://nec.navajo-nsn.gov/Portals/0/Announcements/Navajo%20Epidemiology%20Center%20Update%20May%202016.pdf

Navajo Division of Health (2013). Navajo Population Profile - 2010 U.S. Census. *Navajo Epidemiology Center*. https://nec.navajo-nsn.gov/Portals/0/Reports/NN2010PopulationProfile.pdf

Navajo Nation Water Rights Commission (NNWRC) (n.d.). *Water Rights*. https://nnwrc.navajo-nsn.gov/Water-Rights

Navajo Tribal Utility Authority (NTUA) (2021, March), *Navajo Nation Utility Infrastructure Needs*. https://frf.navajo-nsn.gov/Portals/0/Info%20Webpage/Navajo%20Nation%20Fiscal%20Recovery%20Fund/2021-03-31%20NTUA%20White%20Paper%20Homes%20Lacking%20Utilities.pdf?ver=Vi73G_SpwgFapaVZm-3knw%3d%3d

New Entry Sustainable Farming Project (n.d.). *Farm Incubator Case Studies*. https://nesfp.nutrition.tufts.edu/resources/farm-incubator-case-studies

New Mexico Voices For Children (2020). *New Mexico Kids Count Data Book*. https://www.nmvoices.org/wp-content/uploads/2021/02/KidsCount-DataBook2020-web.pdf

O'Connell, J. M., Wilson, C., Manson, S. M., & Acton, K. J. (2012). The Costs of Treating American Indian Adults With Diabetes Within the Indian Health Service. *American Journal of Public Health*, *102*(2), 301–308. https://doi.org/10.2105/AJPH.2011.300332

O'Keefe, V. M., Fish, J., Maudrie, T. L., Hunter, A. M., Tai Rakena, H. G., Ullrich, J. S., Clifford, C., Crawford, A., Brockie, T., Walls, M., Haroz, E. E., Cwik, M., Whitesell, N. R., & Barlow, A. (2022). Centering Indigenous Knowledges and Worldviews: Applying the Indigenist Ecological Systems Model to Youth Mental Health and Wellness Research and Programs. *International Journal of Environmental Research and Public Health*, *19*(10), Article 10, Figure 2. https://doi.org/10.3390/ijerph19106271

Pardilla, M., Prasad, D., Suratkar, S., & Gittelsohn, J. (2014). High levels of household food insecurity on the Navajo Nation. *Public Health Nutrition*, *17*(1), 58–65. https://doi.org/10.1017/S1368980012005630

Ratified Indian Treaty 372, Navaho (Navajo), Fort Sumner, New Mexico Territory, June 1, 1868; Indian Treaties 1789-1869; General Records of the United States Government, Record Group 11; National Archives Building, Washington DC. https://catalog.archives.gov/id/6172856

Raymond, T. D., & Falk, C. L. (2018). Feeding the Tribe: The Role of Soft Infrastructure in Addressing the Root Problems of the Navajo Nation San Juan River Irrigation System. *American Indian Quarterly*, *42*(3), 306–328. https://doi.org/10.5250/amerindiquar.42.3.0306

Research, B. I. I. for G. (1928). *The Problem of Indian Administration: Report of a Survey Made at the Request of Honorable Hubert Work, Secretary of the Interior, and Submitted to Him, February 21, 1928*. Johns Hopkins Press. https://books.google.com/books?hl=en&lr=&id=rrUvAAAAYAAJ&oi=fnd&pg=PA3&ots=JOszIkXReH&sig=4Y3DF_E7Ea8Qea0x9m81BAeGS6o#v=onepage&q&f=false

Robert Wood Johnson Foundation (2023a). *State of Childhood Obesity – Ages 10-17*. State of Childhood Obesity. https://stateofchildhoodobesity.org/demographic-data/ages-10-17/

Robert Wood Johnson Foundation (2023b). *State of Childhood Obesity – Ages 2-4*. State of Childhood Obesity. https://stateofchildhoodobesity.org/demographic-data/ages-2-4/

Sabeti, H. (2011). The for-benefit enterprise. *Harvard Business Review*, *89*(11), 98–104. https://hbr.org/2011/11/the-for-benefit-enterprise

Sales Tax (2020, as amended), Title 24, Navajo Nation Code, Chapter 6. https://tax.navajo-nsn.gov/Navajo%20Taxes/Statutes/2021.03.22%20%20Sales%20Tax%20Statute%20as%20amended%20by%20CJN-48-20.pdf

Schwarzenberg, S. J., Georgieff, M. K., & COMMITTEE ON NUTRITION. (2018). Advocacy for Improving Nutrition in the First 1000 Days to Support Childhood Development and Adult Health. *Pediatrics*, *141*(2). https://doi.org/10.1542/peds.2017-3716

Sethuratnam, S. (2021). *Understanding the Role and Contributions of the Incubator Farm Program in Creating the Next Generation of Farmers in the United States and Canada* [Doctoral dissertation, University of Guelph]. https://hdl.handle.net/10214/23708

Shoemaker, J. A. (2015). No sticks in my bundle: rethinking the indian land tenure problem. University of Kansas Law Review, 63(2), 383-450

Shoemaker, J. A. (2017). Complexity's shadow: american indian property, sovereignty, and the future. Michigan Law Review, 115(4), 487-552

Siegel, K. R., McKeever Bullard, K., Imperatore, G., Kahn, H. S., Stein, A. D., Ali, M. K., & Narayan, K. M. (2016). Association of Higher Consumption of Foods Derived From Subsidized Commodities With Adverse Cardiometabolic Risk Among US Adults. *JAMA Internal Medicine*, *176*(8), 1124–1132. https://doi.org/10.1001/jamainternmed.2016.2410

Smithsonian Institution (2019) *The Long Walk | The Navajo Treaties*. http://nmai.si.edu/nk360/navajo/long-walk/long-walk.cshtml

Social Value UK (2012). *A Guide to Social Return on Investment 2012*. (n.d.). Social Value UK. https://socialvalueuk.org/resources/a-guide-to-social-return-on-investment-2012/

Social Value UK (n.d.). *SROI Value Map*. https://socialvalueuk.org/wp-content/uploads/2022/12/Value-Map-v7.5.xlsx

Society for Human Resource Management (SHRM) (2022). *SHRM Employee Engagement Survey.* https://www.shrm.org/resourcesandtools/business-solutions/pages/employee-engagement-survey-service.aspx

Stanford Medicine Children's Health (2023). *Feeding Guide for the First Year.* https://www.stanfordchildrens.org/en/topic/default?id=feeding-guide-for-the-first-year-90-P02209

Story, M., Marguerite Evans, Richard R Fabsitz, Theresa E Clay, Bonnie Holy Rock, Brenda Broussard (1999). The epidemic of obesity in American Indian communities and the need for childhood obesity-prevention programs. *The American Journal of Clinical Nutrition*,*69*(4), pp. 747S-754S. https://doi.org/10.1093/ajcn/69.4.747S

United Nation Food and Agriculture Organization (FAO) (2019). *State of Food Security and Nutrition in the World 2019. Rome: Food and Agriculture Organization of the United Nations.* https://books.google.com/books?hl=en&lr=&id=0lWkDwAAQBAJ&oi=fnd&pg=PR1&ots=0qwghLOiMa&sig=UB0q4j2vklCyXMxxuAx5uObtOZk#v=onepage&q&f=false

U.S. Census Bureau (2021a). *American Community Survey 5-year estimates*. Navajo Nation Reservation. http://censusreporter.org/profiles/25200US2430R-navajo-nation-reservation/

U.S. Census Bureau (2021b). *Population Under 18 Years by Age.* American Community Survey 5-year estimates, 2017-2021, Table B09001. Navajo Nation Reservation. https://censuporter.org/data/table/?table=B09001&geo_ids=25200US2430R,01000US&primary_geo_id=25200US2430R

U.S. Census Bureau (2021c). *Household Income in the Past 12 Months (In 2021 Inflation-adjusted Dollars)*. American Community Survey 5-year estimates, 2017-2021, Table B19001. Navajo Nation Reservation. https://censusreporter.org/data/table/?table=B19001&geo_ids=25200US2430R,01000US&primary_geo_id=25200US2430R

U.S. Census Bureau (2021d). *Poverty Status in the Past 12 Months by Age*. American Community Survey 5-year estimates, 2017-2021. Navajo Nation Reservation. https://censusreporter.org/data/table/?table=B17020&geo_ids=25200US2430R,01000US&primary_geo_id=25200US2430R

U.S. Census Bureau (2021e). *Employment Status for the Population 16 Years and Over.* American Community Survey 5-year estimates, 2017-2021, Table B17020. Navajo Nation Reservation. https://censusreporter.org/data/table/?table=B23025&geo_ids=25200US2430R,01000US&primary_geo_id=25200US2430R

U.S. Census Bureau (2021f). *Units in Structure*. American Community Survey 5-year estimates, 2017-2021. Navajo Nation Reservation. https://censusreporter.org/data/table/?table=B25024&primary_geo_id=25200US2430R&geo_ids=25200US2430R,01000US

U.S. Census Bureau (2021g). *Selected Economic Characteristics*. American Community Survey 5-year estimates, 2017-2021, Table B25024. Navajo Nation Reservation. https://data.census.gov/table?q=DP03&t=Occupation&g=2520000US2430R

U.S. Department of Agriculture (2023a). *Latest Available Month – May 2023 – State Level Participation & Benefits.* Food and Nutrition Service. https://www.fns.usda.gov/sites/default/files/resource-files/snap-persons-8.xlsx

U.S. Department of Agriculture (2023b). *SNAP Retail Locator Data*. Food and Nutrition Service, Supplemental Nutrition Assistance Program (SNAP). *https://opendata.arcgis.com/datasets/e9cc76a48ccb45628181ece7b2deb56d_0.csv*

U.S. Department of Agriculture (2017a). *Navajo Nation Profile*. 2017 Census of Agriculture, National Agricultural Statistics Service. https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/Navajo_Nation_Profiles/Navajo-Nation.pdf

U.S. Department of Agriculture (2017b). 2017 *Navajo Chapter Summaries, Navajo Nation Totals, Age group: Under 25 years.* National Agricultural Statistics Service. https://www.nass.usda.gov/Data_Visualization/Census/Navajo_Profiles/index.php

U.S. Department of Agriculture (2017c). *2017 Highlights – Farm Producers.* 2017 Census of Agriculture, National Agricultural Statistics Service. https://www.nass.usda.gov/Publications/Highlights/2019/2017Census_Farm_Producers.pdf

U.S Department of Agriculture (n.d.). *Co-ops: A Key Part of Rural America*. (n.d.). https://www.usda.gov/topics/rural/co-ops-key-part-fabric-rural-america

U.S. Department of Agriculture (2022, Aug.). *Land Values 2022 Summary*. National Agricultural Statistics Service. https://www.nass.usda.gov/Publications/Todays_Reports/reports/land0822.pdf

U.S. Department of Health and Human Services (HHS) (2021, Jul.*). Infant Mortality and American Indians/Alaska Natives.* Office of Minority Health. https://www.minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlID=38

U.S. Department of the Interior (2023). *Why Food Sovereignty Matters*. Indian Affairs, Office of Indian Economic Development. https://www.bia.gov/service/indigenous-tourism/why-food-sovereignty-matters#:~:text=There's%20no%20universal%20definition%20for,food%20is%20produced%20and%20distributed

Welton, J. (2014). *Growing for No Profit. Cornell Small Farms Program*. Cornell College of Agriculture and Life Sciences. https://smallfarms.cornell.edu/2014/04/growing-for-no-profit/

Wu, K.I. (2019). *Should Our Company Establish a Corporate Foundation?* Perlman + Perlman. https://perlmanandperlman.com/company-establish-corporate-foundation/

Yazzie D, Tallis K, Curley C, Sanderson PR, Eddie R, Behrens TK, et al. (2020). The Navajo Nation Healthy Diné Nation Act: A Two Percent Tax on Foods of Minimal-to-No Nutritious Value, 2015–2019. *Preventing Chronic Disease*;17:200038. DOI: http://dx.doi.org/10.5888/pcd17.200038

Healthy Diné Nation Act of 2014, Title 24, Navajo Nation Code, Chapter 11, §1001.

U.N. Food and Agriculture Organization (FAO) (2019). *State of Food Security and Nutrition in the World 2019. Rome: Food and Agriculture Organization of the United Nations*. https://books.google.com/books?hl=en&lr=&id=0lWkDwAAQBAJ&oi=fnd&pg=PR1&ots=0qwghLOiMa&sig=UB0q4j2vklCyXMxxuAx5uObtOZk#v=onepage&q&f=false

Appendices

Appendix A

Navajo Foods & Preparation[37]

Food Item	Preparation
"Le-ci-pe-j" - Corn Steamed in the Earth	Immature Navajo White Corn is steamed underground for at least 12 hours (in their husks) and eaten directly off the cob.
"Nectjiji" - Dried Corn Steamed in the Earth	Matured Navajo White corn that is steamed underground for at least 12 hours (in their husks), then unhusked and dehydrated. It is then boiled with or without meat.
"Ts'a-lpaih" - Ground Dried Corn Steamed in the Earth	Ground "Nectjiji" eaten dry or mixed with water, milk or coffee and drunk.
"Yi'ljo" - Roasted Corn/Dried Shelled Corn	Navajo White Corn that is husked and roasted over hot coals.
"Xani-kaih" - Lye hominy	Dry Navajo White Corn Kernels boiled whole with or without meat until the husk of the grain breaks and the white kernel swells and becomes tender.
"Na'ta'sit'eh" - Parched Corn	Dry Navajo White Corn.
"Ne'ectjijii" - Ground Parched Corn	Dry Navajo White Corn that is ground into a flour.
Txopihinil - Ground Corn Mush	Dry Navajo White Corn that is ground into a flour then stirred into hot water to make a mush.
Akhan - Ground Corn	Navajo White Corn that is ground into a flour and then sifted.
Ta'tinilya'j - Fried Bread	Whole wheat flour or commercially processed white flour mixed with salt, baking powder and water or milk. Once kneaded, dough is fired for a short time in boiling fat.
Naneskha'ah - Baked Bread	Made with commercially processed flour or cornmeal and mixed with salt, baking powder and water or milk. Once kneaded, dough is slapped or flattened into cakes 15-20cm in diameter and about 12 mm thick then baked over hot coals on a griddle, flat stone or metal plate.
Pa; - Navajo Yeast Bread Pa'yaj - Navajo Yeast Bread Rolls	Two parts whole wheat flour or commercially processed white flour, one yeast cake, salt and mutton fat. Once kneaded, dough is baked in a Spanish oven or covered and placed over hot coals and ash.

[37] Steggerda, M., & Eckardt, R. B. (1941). Navajo Foods and Their Preparation1,2,3. *Journal of the American Dietetic Association*, *17*(3), 217–226. https://doi.org/10.1016/S0002-8223(21)42654-4

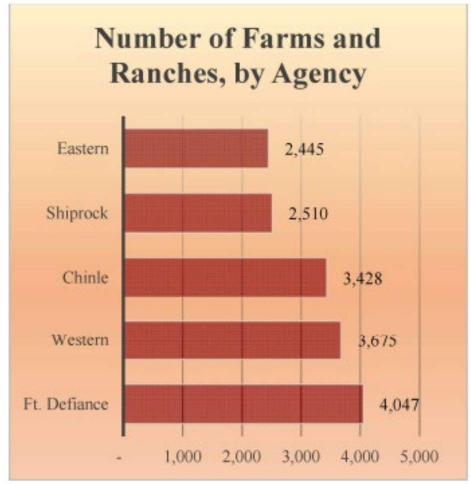
Titloki - Dried Kneel Down Bread	Kneel down bread that is dried (preserved) and later reboiled in goats milk or water.
Nata’lesa - Corn Ash Cake	Grind any corn, usually blue corn, combine with juniper ash and water. Kneaded dough is shaped into loaves 15cm long and 8cm wide/thick. Loaves are placed on the hot ground, covered with hot ashes, dirt and sand and baked slowly.
Ape’nezmash - Milk Corn Cakes	Grind any corn and add salt and goats milk to make a soft batter. The mixture is baked on hot stones or metal plates.
Nanoye’jiih - Poured Bread	Grind any corn, add water, and if available, juniper ash. Stir the mixture into a thin batter, poured onto the hearth, covered with hot ashes and baked for an hour or less.
Leyiljoj - Sprouted Corn Bread	Ground mature corn which is added to group wheat and water. Mix well and wrap in corn husks. Let the dough stand for some time until the enzyme in the germinated wheat converts the starch in the corn flour to sugar. The breads are then baked in a heated pit.
Alkha’t - Sprouted Corn Cake (aka Kinalda Cake)	Ground mature corn which is added to group wheat and water. Mix well and pour into a heated pit lined with layers of corn husks, then baked all night.
Txanahni’l - Boiled Sprouted Corn Bread	Ground mature corn which is added to group wheat and water. Mix well and boil.
Titloki’ Pisk’oh - Green Corn Bread	Corn is ground in its milk stage, sugar is added and the two are worked into a stiff dough which is baked for 30 minutes. The bread is sliced and dehydrated. When ready to be used, it is broken and boiled in goat's milk.
Tshe’st’eih - Paper Bread	Make a thin batter by pouring boiling water over corn flour. When cooled, it is slightly thickened with more corn flour. A handful of this thin batter is rapidly spread over a large, smooth flat store, which is hot so that the batter cooks almost instantly. Then the thin bread is lifted off the stone and can be eaten as soon as it is baked, mixed with stew or stored for a long time.
K’inecpijih - Boiled Blue Corn Dumplings	Ground blue corn with juniper ash and sufficient water to make stiff dough. Dough is formed into small round dumplings 2-5 cm in diameter, which are boiled in water for about 20 minutes.
Txanil - Corn mush	Corn flour (usually blue corn) and unsalted water combined with a small amount of juniper ash. Made with boiled milk or water.
Txanacki’j - Steamed Corn Mush	Corn flour (usually blue corn) that is placed on top of boiling water and covered. Cooked for 20 minutes in the steam, then taken off the heat and mixed into boiling liquid.

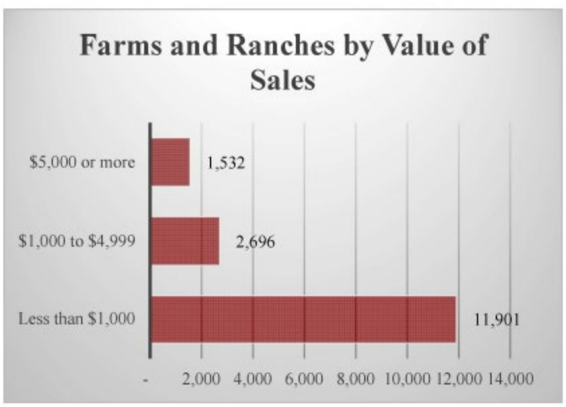
Food Item	Preparation
Na'oli - Beans	Dehydrated beans that are boiled when ready to eat.
Namasi'h - Wild Potatoes Nasisi;pinamasih - Wild Potato Mush	Emit an unpleasant astringent effect on the mouth due to small amounts of phosphate found in the clay where these potatoes grow. Clay and potatoes are eaten together like a mush.
Tl'ohtchin - Wild Onion	Onion bulbs are rubbed on hot ashes to singe and remove strong taste, then added to stews.
Aze'titic'ih - Chile Peppers	Occasionally used to add in foods.
Chimaja - Wild Celery	Used as an herb to flavor stew or cornmeal mush, along with wild onions.
Xack'an - Dried Yucca	Fruit pods are gathered, seeds are scraped out and fruit is dehydrated. When ready to eat, fruit is boiled in water and eaten as a dessert.
Opuntia - Prickly Pears	Fruit is harvested and thorns are rubbed off. Fruit is boiled and eaten plain. Leftover boiling water is consumed as juice.
Ta'nesk'anih - Musk Melon	Preserved by dehydrating in thin strips like pumpkin. Eaten fresh or boiled after dehydration.
T'e'htjiyan - Dried Watermelon	Melon is cut in thin pieces and dried. Melons can also be kept fresh by storing in an underground pit.
'Atthic - Pinon Nut Butter	Ground roasted pinon nuts.
Tchiltchin - Red Squaw / Sumac Berries	Boiled with sugar and flour to make a sweet mush. Can also be boiled with meat.
Titzenane'skha'ti - Choke Cherry Cakes	Cherries are picked, ground raw including seeds, patted into a cake and dried in the sun. Mostly for medicinal purposes.
Ti'ohte'skuih - Amaranth	Ground and boiled into a gruel, after which corn flour is added. It can also be mixed with corn flour and made into bread. Occasionally it is made in dumplings.
Indian Rice Grass	Commonly foraged on mesas and made into bread, dumplings or gruel.
Wa' - Rocky Mountain Bee Plant	Plant with a strong odor, but the shoots are mild. Foraged in June and eaten as greens. Can be boiled in water and pressed into small balls and eaten fresh or with mutton. Can be dehydrated for winter.
Tshit pahha sit'eko - Mutton	Boiled, roasted or broiled, cook over coals. Parts eaten include: Large Intestine, Stomach, Skin, Blood sausage, Feet.
Kah - Rabbit	Boiled, roasted or broiled, cook over coals.

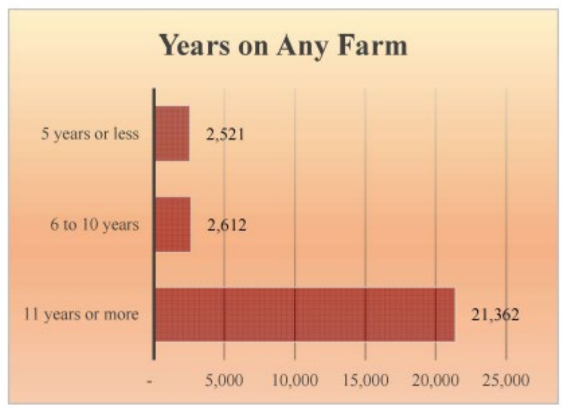
Appendix B

USDA Navajo Nation Census Profile: Number of Farms & Ranches, Farms & Ranches by Value of Sales, Years on Any Farm[38]

	2017	% of Navajo Nation
Number of Farms and Ranches	16,129	100.0
Total	($)	
Market value of products sold	87,652,600	100.0
Crop sales	69,353,700	100.0
Livestock sales	18,298,900	100.0
Farm production expenses	163,161,600	100.0
Per farm average	($)	
Market value of products sold	5,435	
Share of Sales by Type	(%)	
Crop sales	79.1	
Livestock sales	20.9	







[38] U.S. Department of Agriculture (USDA). *2017 Census of Agriculture -- Navajo Nation Profile*. National Agricultural Statistics Service, https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/Navajo_Nation_Profiles/index.php

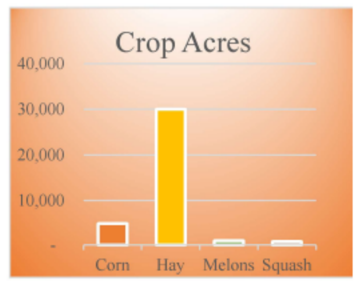
Appendix C

USDA Navajo Nation Census Profile: Livestock and Crop Totals, Producers by Age Group[39]

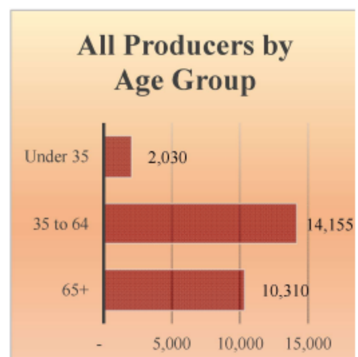
Livestock and Crop Totals

Livestock	Farms	Inventory	% of Navajo Nation
Cattle and calves	6,126	71,374	100.0
Beef cows	4,917	42,123	100.0
Sheep and lambs	10,172	194,034	100.0
Horses and ponies	9,416	48,794	100.0
Goats	5,682	68,044	100.0

Crops	Farms	Acres	% of Navajo Nation
Corn, traditional, acres	1,977	4,977	100.0
Hay and haylage, acres	482	30,010	100.0
Vegetables, acres	1,243	8,394	100.0
Cantaloupes, acres	209	83	100.0
Honeydew melons, acres	102	45	100.0
Squash, all, acres	1,013	798	100.0
Watermelons, acres	826	802	100.0



Total Producers[a]	**26,495**
Average age (years)	*59.5*
Sex	
Female	14,126
Male	12,369
Other characteristics	
With military service	1,784
New and beginning farmers	5,133
Young Producers	2,231



[39] U.S. Department of Agriculture (USDA). *2017 Census of Agriculture -- Navajo Nation Profile*. National Agricultural Statistics Service, https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/Navajo_Nation_Profiles/index.php

Appendix D: Social Return On Investment (SROI) Evaluation

Stage 1		Stage 2			
Stakeholders	**Challenges**	**Inputs**		**Outputs**	**Outcomes**
Who does this effect?	*What might change for them?*	*Investment(s)*	*$ Value*		*Description*
Bidii Baby Foods Staff & Contractors	Sufficient staff or access to cropland to scale up and meet demand.	Time, Personnel Costs, Travel/Transportati on Costs, Administrative Fees.	$60,945.89	15 staff	▲All cooperative members hold Navajo Nation agricultural land use permits with quantified water rights (annual). ▲At least 100 acres of cropland is cultivated by cooperative members to meet demand. ▲Soil testing and USDA NRCS conservation reports show improved nutrient density in the soil compared to baseline.
Bidii Baby Foods Cooperative Members	Sufficient staff or access to cropland to scale up and meet demand.	Time, Personnel Costs, Travel/Transportati on Costs, Administrative Fees.	$15,000	20 co-op members	
BEN Initiative Staff, Contractors and Interns	Ability to secure grant funding to support organizational growth.	Time, Personnel Costs, Administrative/Over head Costs, Infrastructure Costs.	$20,226.24	4 staff	▲Sustain current operations and grant revenue.
Farm volunteers	Transportation, Time	Transportation, Time	$12/hr, $0.58/mile	100+ annually	▲At least 100 unique volunteers participate in farm events (i.e., planting, irrigating, cultivating, harvesting). ▲At least 300 unique community members participate in an onsite farm event annually (i.e., planting, harvesting, farm-to-table cooking class, etc.).
Land Based Learning Event Participants	Transportation, Time	Transportation, Time	$0.58/mile	300+ annually	

Appendix D: Social Return On Investment (SROI) Evaluation

Stage 1		Stage 2			
Stakeholders	**Challenges**	**Inputs**		**Outputs**	**Outcomes**
Who does this effect?	*What might change for them?*	*Investment(s)*	*$ Value*		*Description*
Early Childhood Wholesale Purchasers[a]	Budget, Supply Chain/Transportation issues	Transportation, Cost of Product	-- $0.58/mile -- $2/lb. fresh produce -- $10-15/lb. traditional foods	-- HS/PreK: 96 -- IHS: 8 -- HVP: 6 -- SD: 17	▲~96,000 lbs. of fresh produce and traditional food products are sold to early childhood wholesalers.
Itinerant (Direct to Consumer) Purchasers	Transportation, Affordability	Transportation, Cost of Product	-- $0.58/mile -- $2/lb. fresh produce -- $10-15/lb. traditional foods	300+ annually	▲~1,000 lbs. of fresh produce and traditional food products are sold direct to consumer.
Navajo Nation Children aged 0-5 years	Participation in EC programs, Geographic location, Parental SES	Program Enrollment, Transportation, NSLP qualification	-- $0.58/mile -- $2/lb. fresh produce -- $10-15/lb. traditional foods	10,543	▲Every Navajo newborn has access to BBF food to meet nutritional needs between 4-8 months (~106 1-lb bags per child). ▲Every Navajo child attending PreK/Head Start programs are given locally grown and/or traditional foods at least once per month (12 x per year) within the NSLP. ▲Obesity rates by the time children enter kindergarten decrease, thus decreasing the overall cost of overweight/obesity in children under 18.

[a] Head Start/PreK, IHS, Home Visiting programs, school districts

Appendix D: Social Return On Investment (SROI) Evaluation

Stage 1		Stage 2			
Stakeholders	**Challenges**	**Inputs**		**Outputs**	**Outcomes**
Who does this effect?	*What might change for them?*	*Investment(s)*	*$ Value*		*Description*
Navajo Nation Women aged 15-50 who gave birth in the last year	Geographic Location, Affordability	Transportation, Cost of Product	N/A	1,843	▲~212,000 1-lb bags of Bidii Baby Foods LLC are manufactured and distributed to cover nutritional needs of all Navajo children aged 4-12 months (106 bags per child x 2,000 children under 12 months).
Navajo Border Town, Off-Reservation Residents[b]	Geographic Location, Affordability	Transportation, Cost of Product	N/A	33,370 (all ages) ~20,000 (target ages)	
Navajo Urban, Off-Reservation Residents	Geographic Location, Affordability	Transportation, Cost of Product	N/A	86,455	
Navajo Nation Government	Budget, Supply Chain/Transportation issues, Political Will	Transportation, Cost of Product	N/A	Economic Development Department, Office of Special Education and Rehabilitation Services	
Navajo Area IHS pediatric department staff (pediatricians, lactation consultants, dieticians, etc.)	Bias, Prior Western Medical Training, Lack knowledge on indigenous foods	Time, Storage of materials	$80/hr	Unknown, Estimated <100	▲1-2 providers in each service unit (8) who can provide baby foods during pediatric appointments and store products onsite at HIS.

[b] Farmington, NM; Gallup, NM; Flagstaff, AZ; Page, AZ; Winslow, AZ; Bloomfield, NM; Holbrook, AZ; Blanding, UT; Grants, NM; Cortez, CO; Durango, CO; Aztec, NM

Appendix D: Social Return On Investment (SROI) Evaluation					
Stage 1		Stage 2			
Stakeholders	**Challenges**	**Inputs**		**Outputs**	**Outcomes**
Who does this effect?	*What might change for them?*	*Investment(s)*	*$ Value*		*Description*
Social Media/Website Users	Internet Connectivity, Connection to Content	Phone/Internet fees	$100/month	50,000 (annual)	▲ User engagement leads to increased awareness and product sales.

Appendix D: Social Return On Investment (SROI) Evaluation							
Stage 1	Stage 3						
Stakeholders	**Indicator**	**Source**	**Quantity**	**Duration**	**Financial Proxy**	**$ Value**	**Source**
Who does this effect?	*How do we measure it?*	*Where is the information from?*	*How much change was there?*	*How long does it last?*	*What proxy values the change?*	*What is the value of the change?*	*Where did the information come from?*
Bidii Baby Foods Staff & Contractors	▲Cooperative member land use permits under their names with # acres identified on the permit. ▲USDA Conservation planning through EQIP Soil Testing.	Agricultural Land Use Permits	20	Indefinite	$ amount per acre[c]	$1600/acre x 100 acres = $160,000	New Mexico Dept of Agriculture
Bidii Baby Foods Cooperative Members		USDA Conservation Plan (Annual); Independent Laboratory Testing Report	16-100 acres	1 year	Laboratory Test Kit Cost	$100/year	Laboratory website

[c] Navajo Nation land is trust land and is not bought and sold, so no market value is available. Therefore, prevailing per acre land costs in New Mexico have been used as a proxy.

Appendix D: Social Return On Investment (SROI) Evaluation

Stage 1	Stage 3						
Stakeholders	**Indicator**	**Source**	**Quantity**	**Duration**	**Financial Proxy**	**$ Value**	**Source**
Who does this effect?	*How do we measure it?*	*Where is the information from?*	*How much change was there?*	*How long does it last?*	*What proxy values the change?*	*What is the value of the change?*	*Where did the information come from?*
BEN Initiative Staff, Contractors and Interns	$ amount of grant funding	Accounting software Statement of Activity (Class)	Not specified	5+ years	Grant Contracts	$250,000/year	Accounting Software
Farm volunteers	# of unique (non-repeat) volunteers attending an onsite volunteer event for a minimum of 30 minutes.	Volunteer Sign in Sheet	100	1 year recurring	# hours volunteering, Miles from community to farm.	$5000/year	Bidii Baby Foods Annual Logbook
Land Based Learning Event Participants	# of unique (non-repeat) community members attending an onsite event for a minimum of 30 minutes.	Event Sign In Sheet	300	2 years recurring	Sign in sheet mileage, average $50 per attendee x 300 attendees.	$1500/year	Bidii Baby Foods Annual Logbook

Appendix D: Social Return On Investment (SROI) Evaluation

Stage 1	Stage 3						
Stakeholders	**Indicator**	**Source**	**Quantity**	**Duration**	**Financial Proxy**	**$ Value**	**Source**
Who does this effect?	*How do we measure it?*	*Where is the information from?*	*How much change was there?*	*How long does it last?*	*What proxy values the change?*	*What is the value of the change?*	*Where did the information come from?*
Early Childhood Wholesale Purchasers[d]	Total sales (# lbs. fresh produce, # lbs. traditional food products) to wholesale vendors.	Online Sales/Invoices	96000	1 year, recurring	Sales summary reports, Invoices	$192,000/year	Online Sales Summaries, Invoices, Traceability logs
Itinerant (Direct to Consumer) Purchasers	Total sales (# lbs. fresh produce, # lbs. traditional food products) to wholesale vendors.	Online Sales/Invoices, Cash sales records	300	1 year, recurring	Sales summary reports, Invoices, cash sales records	$2,000/year	Online Sales/Invoices, Cash sales records

[d] Head Start/PreK, IHS, Home Visiting programs, school districts

Appendix D: Social Return On Investment (SROI) Evaluation							
Stage 1	**Stage 3**						
Stakeholders	**Indicator**	**Source**	**Quantity**	**Duration**	**Financial Proxy**	**$ Value**	**Source**
Who does this effect?	*How do we measure it?*	*Where is the information from?*	*How much change was there?*	*How long does it last?*	*What proxy values the change?*	*What is the value of the change?*	*Where did the information come from?*
Navajo Nation Children aged 0-5	▲# of children under 5 enrolled under Navajo Nation Certificate of Indian Blood. ▲# children enrolled in Navajo Nation early childhood programs (Head Start, PreK, Home Visiting, EI).	Navajo Nation Census Navajo Nation Office of Vital Records Navajo Nation Office of Special Education and Rehabilitation Services Navajo Nation Office of Head Start.	10,543	1 year, recurring	▲Cost of feeding children (4-12 months ~106 1-lb bags; 1 lb. produce 1x/month). ▲Cost of treating childhood oversight and obesity related health issues.	$2,120,000	Online Sales/Invoices
Navajo Nation Women aged 15-50 who gave birth in the last year	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Appendix D: Social Return On Investment (SROI) Evaluation							
Stage 1	**Stage 3**						
Stakeholders	**Indicator**	**Source**	**Quantity**	**Duration**	**Financial Proxy**	**$ Value**	**Source**
Who does this effect?	*How do we measure it?*	*Where is the information from?*	*How much change was there?*	*How long does it last?*	*What proxy values the change?*	*What is the value of the change?*	*Where did the information come from?*
Navajo Border Town, Off-Reservation Residents(Farmington, NM, Gallup, NM, Flagstaff, AZ, Page, AZ, Winslow, AZ Bloomfield, NM, Holbrook, AZ Blanding, UT Grants, NM, Cortez, CO, Durango, CO, Aztec, NM)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Navajo Urban, Off-Reservation Residents	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Navajo Nation Government	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Navajo Area IHS pediatric department staff (pediatricians, lactation consultants, dieticians, etc.)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Social Media/Website Users	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Appendix D: Social Return ON Investment (SROI) Evaluation

Stage 1	Stage 4				Stage 5				
Stakeholders	**% Deadweight**	**% Attribution**	**% Drop Off**	**Impact**					
Who does this effect?	*What would have happened without the activity?*	*Who else contributed to the change?*	*Does the outcome drop off in future years?*	*Quantity * financial proxy - deadweight, displacement and attribution*	*Year 1 ($)*	*Year 2 ($)*	*Year 3 ($)*	*Year 4 ($)*	*Year 5 ($)*
Bidii Baby Foods Staff & Contractors	5%	5%	0%	144,000	$28,800	$28,800	$28,800	$28,800	$28,800
Bidii Baby Foods Cooperative Members	0%	0%	0%	10,000	$2,000	$2,000	$2,000	$2,000	$2,000
BEN Initiative Staff, Contractors and Interns	10%	10%	100%	75,000	$250,000	$250,000	$200,000	$150,000	$75,000
Farm volunteers	0%	0%	5%	4,750	$5,000	$4,950	$4,900	$4,850	$4,750
Land Based Learning Event Participants	5%	5%	5%	1,275	$1,500	$1,450	$1,400	$1,325	$1,275
Early Childhood Wholesale Purchasers[e]	0%	2%	5%	178,560	$35,712	$71,424	$107,136	$142,848	$178,560
Itinerant (Direct to Consumer) Purchasers	10%	5%	2%	1,660	$1,660	$1,660	$1,660	$1,660	$1,660
Navajo Nation Children aged 0-5 years	0%	0%	5%	2,014,000	$402,800	$805,600	$1,208,400	$1,611,200	$2,014,000

[e] Head Start/PreK, IHS, Home Visiting programs, school districts

Appendix D: Social Return ON Investment (SROI) Evaluation

Stage 1	Stage 4				Stage 5				
Stakeholders	**% Deadweight**	**% Attribution**	**% Drop Off**	**Impact**					
Who does this effect?	*What would have happened without the activity?*	*Who else contributed to the change?*	*Does the outcome drop off in future years?*	*Quantity * financial proxy - deadweight, displacement and attribution*	*Year 1 ($)*	*Year 2 ($)*	*Year 3 ($)*	*Year 4 ($)*	*Year 5 ($)*
Navajo Nation Women aged 15-50 who gave birth in the last year	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Navajo Border Town, Off-Reservation Residents(Farmington, NM, Gallup, NM, Flagstaff, AZ, Page, AZ, Winslow, AZ Bloomfield, NM, Holbrook, AZ Blanding, UT Grants, NM, Cortez, CO, Durango, CO, Aztec, NM)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Navajo Urban, Off-Reservation Residents	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Appendix D: Social Return ON Investment (SROI) Evaluation

Stage 1	Stage 4				Stage 5				
Stakeholders	**% Deadweight**	**% Attribution**	**% Drop Off**	**Impact**					
Who does this effect?	*What would have happened without the activity?*	*Who else contributed to the change?*	*Does the outcome drop off in future years?*	*Quantity * financial proxy - deadweight, displacement and attribution*	*Year 1 ($)*	*Year 2 ($)*	*Year 3 ($)*	*Year 4 ($)*	*Year 5 ($)*
Navajo Nation Government	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Navajo Area IHS pediatric department staff (pediatricians, lactation consultants, dieticians, etc.)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Social Media/Website Users	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				Impact Value Totals	$727,472	$1,165,884	$1,154,296	$1,942,683	$2,306,045
				Net Impact Value					$7,696,380
				Benefit Value					$21,288,162
				SROI					2.8:1

Appendix E: FARMER-IN-REZidence PROJECT TIMELINE

PROJECT TITLE	Farmer-in-REZidence Program	COMPANY NAME	Bidii Baby Foods LLC
PROJECT MANAGER	Mary Ben	DATE	01/01/24-12/31/24

PHASE	PHASE	TASKS	OUTPUTS
1	Preparation	Curriculum Development	Content and materials finalized
		Program Recruitment	New/Beginner Farmers Experienced Farmer Mentors
		Technical Skills Trainings	Agronomic Training
			Business Development Training
		Certification	Farm Safety
			SNAP/WIC
			Farm-to-School
			Manufacturing
2	Production	Land Access	Land Allotment under MOA
		Water Access	Water Allotment under MOA
		Shared Heavy Equipment	Tractor/Implement Use under MOA
		Shared Infrastructure	Irrigation piping and fencing Installed
		Shared Farm Tools	Farm tools available onsite and tracked through checkout form
		Standard Operating Procedure & Logbook Development	SOP training and hands-on support to draft SOP and print logbook for each participant
3 - 4	Aggregation & Processing	Shared Farm tools	Farm tools available onsite and tracked through checkout form
		Shared Transportation Equipment	Shared vehicle and trailer available upon request and tracked through checkout form
		Inventory Logs	Completed weekly, post processing
		Marketing Materials	Materials developed OR cooperative member application completed to sell under BBF marketing materials
		Develop Distribution Plan	Contact potential buyers to determine retail, wholesale and direct to consumer options
		Commercial Kitchen Use Agreements	Forward rental contracts for kitchen use and storage
5	Distribution	Liability Insurance	Seasonal group coverage
		Connection to Retail Markets	Email/phone connection
		Connection to Wholesale Markets	Buyer-Producer Meeting (virtual or in person)
		Connection to Farmers Markets	Applications in to Northwest NM Farmers Market Association
		Online Sales	Square Online training and monthly fees
		Direct to Consumer Sales	Flea Markets, conferences, events
6	Sustainability	Capital Investments	Quarterly upcoming grant summaries
		Land identification and transfer	Identification of available LUPs and legal support to complete transfer
		Shared/Used equipment and infrastructure	Discounted rental fees for cooperative members and program participants
		Fiscal Sponsorship	Available to program participants and graduates at 5% admin fee rate
		Ongoing Professional Development and Mentorship	Quarterly meetings and 1:1 mentorship as needed