Youth Food Sustainability Project
Arviat, Summer 2013

Activity Summary

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Contents

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Introduction

Introducing greenhouse and compost systems as a community initiative in Arviat, this summer project employed six summer students and recent graduates with two university level supervisors in the exploration of potential adaptations for improved food security and waste management. Core to this multifaceted approach was the learning potential it provided for the engagement of local students, whose prolonged involvement will be essential for the continuation of the instigated endeavors. Elementally our initiative can be divided into 5 components: vegetable production, organic waste disposal or composting, food storage, local plant usage and local food habits. Within these areas a variety of building, sampling, interviewing and basic research principles were utilized.

Figure 1: Workers Team on the Youth Food Sustainability Project

Vegetable Production

Construction

15 grow boxes were built using adaptations of pallet derived raised planters found online. Students took an active role in the development in tops and drip trays. As with much of our building, the structures were driven by resource availability and subject to adaptation and improvement throughout their materializing. For many of the students involved this was their first experience wood working, thus the majority of early work was on tool use and safety through the building of scrape prototypes. The final designs were a small (approximately 32"x17"x18"l x w x h) indoor planter with a drip tray, a medium (41"x19"x35") box with a wooden coldframe-style top, and a large (48"x27"x43") box with a domed top. This larger design used 1/2"plastic piping, whereas the others were constructed from solely wood (palate, ply and 1"3"). The hinges for the attachment of the tops and polyethylene 5mil vapor barrier plastic was shipped in from the Churchill Home Hardware. For more detailed construction instructions please site the separate documents and diagrams focused on this aspect.

These outdoor models would be best located near an exterior wall as the additional shielding from wind extremes would prolong their lifespan. Also in case of overheating the tops may be wedged open to allow aeration. A more sophisticated if complicated solution would be to make flaps in the sides. However, this may encourage tearing in the plastic if the edges are not reinforced. Excessive winds may on the other hand cause the top to lurch open in a damaging manner. These boxes are planned to be distributed to different local families under the "Adopt a grow box" plan for next spring. This will be vital in engendering community involvement and interest. Active participation and knowledge in plant growth are promising methods of vegetable promotion.

The indoor planters are moving into public buildings at the end of this summer project and the plants contained will be cared for by those working in these buildings. The main determinant in locating them is sunlight availability, preferably near south-facing large windows. This public location maximizes exposure as many people will be able to involve themselves.

Monitoring and assistance should be provided to plant box caregivers subsequent to their dispersal, especially due to the general lack of familiarity with gardening of the majority and indeed target group of the populace.

An another idea conceived by the students during the designing stage was to use 2L clear plastic pop bottles, lined with Styrofoam plastic from disposable cups and food trays (for the bottom) to create herb grow pots. By cutting the top off the bottle and then tying it back on a simple covering is created to shelter the plants, while the reconstructed Styrofoam container provides an insulated pot with the surrounding bottom of the plastic bottle offering a water collection area. This would be most beneficial for individual household implementation and it may be beneficial to make prototypes and then promote them as such (as a fun home project). The device would be great for small herbs, with shallow rooting.

Figure 2: Grow Box Construction

Figure 3: Grow Box Construction

Figure 4: Finished Grow Boxes

Planting

Due to the seasonal lateness of our initiation, this portion was limited to trial growth modules. Remaining within the green ethics driving the initiative, the majority our seedlings were planted in old yogurt containers and ice-cream tubs during their germination. This highlighted a fundamental approach of object versatility, encouraging reusability, an element with a long standing history within Northern communities. Vessel and more acutely soil limitations lead to the seeding of multiple plants in some of the pots. Our initial selection, determined through local seed availability, were Bibb Lettuce, Iceberg Lettuce, Romaine Lettuce, Swiss Chard, Long Standing Bloomsdale Spinach, Tiny Tim Tomatoes, Pink Ponderosa Tomatoes, Hybrid Sweet Slice Cucumbers, Gourmet Parisienne Carrots and Standard Carrots. Early Practice in planting and soil experimentation was conducted on Walking Stick Kale, intended to remain an indoor potted plant.

As many of these seeds were quite outdated germination success was promising of appropriate care. All the cucumber seeds failed to germinate after two weeks (surpassing the recorded 8-10 day suggestion), and accordingly the seeds were manually checked for signs of growth and in the absence of such the topsoil was reclaimed. 71% of the 42 pots produced viable seedlings, of those that failed 59% were cucumber (100% of this variety), 25% were lettuce (14% of this variety), 8% were tomatoes (25% of this variety) and 8% were spinach (20% of this variety). However, inference from this is likely limited to the seeds themselves. Cucumbers have been grown in local greenhouses, retaining future inclusion potential. The hardiness and frequently shorter growth season of spinach is a favourable trait or the region. The head lettuces have been reported to produce infestation difficulties in one local private greenhouse; however, growth itself, especially in indoor planters, remains feasible.

During the early development of the seedlings, height was used as a health indicator. This enabled practice of simple measurements for the summer students, as well as proper scientific recording. Tomatoes experienced the most promising growth withindoors, however, limits to speculation include the mid-summer high heats conducive to this plants success and the required maturity size before fruit production. As such growth within small grow boxes may be less productive, than within larger structures (homes or full greenhouses). Also structural flaccidity was observed leading to the splinting of some specimen, especially with the lettuce.

Transplanting of the seedlings was performed in a staggered fashion according to soil availability. As of 15/08/2013, 73% of the 11 spinach transplants, 86% of the 21 bibb lettuce transplants, 26% of the 19 iceberg lettuce, 100% of the 4 swiss chard, 47% of the 19 carrots and 98% of the 45 tomatoes survived the process. This correlates strongly with the fragility of lettuce and carrots root systems. It is advised that next year the carrots are directly planted in the planters following the final frost. An alternative method would be sprouting the seeds in wet paper towel, however, this is untested. If peat or decomposable pots were located this would eliminate the necessity for excessive transplant handling. Additionally using individually plots within disposable pots (i.e. with thinner container material to alleviate breaking) and potting soil (as the local soil has too fine of a particle structure for the necessary adhesion) could be effective.

This transplanting was isolated to the smaller indoor grow boxes due to the short predicted outdoor suitable growth period remaining, and time limitations for soil processing. Filling and distributing the larger models will be an early focus for next year. Similar to the smaller boxes, a bottom layer of stones intermediary of land soil and top of 1:1 land-soil:topsoil blend is suggested. However to improve efficiency above the stones an unfiltered, but tilled layer of soil may be introduced to improve efficiency.

It was discovered that the time difference between filtering and breaking the sod was insignificant for the quantity used. However, the benefit of this may be increased proportionately to the volume required.

Additional seeds purchased for next year were primarily targeted or the shortest growth season or frost tolerance hoping to extend the appropriate growth period within our sheltered grow boxes (including lettuce spinach, swiss chard, radish and beet varieties).

Figure 5: Growing Station

Figure 6: Grow Boxes after Transplantation

Water

In a comparison of rain water, retrieved from rain barrels collecting drainage run-off, to the delivered housing water, a greater germination success was observed with housing water (38 compared to 21 seedlings). This suggests that the treatment of local water is non-detrimental to early growth. pH strip testing (with maximal potential precision locally feasible in using a 6-8 pH specific variety) indicated that the rain water may be modestly more acidic, congruent with notions of pollutant effects, however this 0.1 difference is negligible within the limits of the testing precision. Prolonged comparisons should be conducted to ensure negative effects on maturation progression are not created. Advice from local gardeners indicate that either rainwater (used at the Catholic Site) or local freshwater from rivers or lakes (Don St Johns Buildings) is superior. As planning for piping or transportation of local freshwater has yet to be feasibly prepared, of these choices rainwater is more viable, if unpredictable. Oil barrels may be cleaned for this purpose. Alternative containers may be located at the local dump sites, with the main prerequisites being a similar (45 gallon) capacity preferably and cleanliness.

Soil

The most stagnating of challenges was encountered in appropriate soil acquisition. The high retail price of potting varieties shipped in, approximately $56 for 17L, make it unfeasible for large scale projects. Additionally the shipment time required for such goods were an insurmountable confound for this particular late summer initiative. The local predominance of mossy and boggy tundra, made locating soil deposits challenging. Regardless several sites with shallow appropriate regions above sand and rock foundations were identified. Extraction of this dirt was achieved with the temporary top sod level removal and replacement, aiming to minimize damage to the resident plants. Once appropriated, this combination of dirt, moss, roots and occasional seaweed remains required sifting. The chosen method utilizing spare window screen mesh, was successful in removing excessive plant remains liable to produce weeds or growth difficulties. However the poor particle quality was simultaneously rendered finer, making water retention an acute concern. Improving this will require the addition organic mulch from the composters or of purchased soil as currently implemented.

The other anxiety is regarding the low pH, indicated by strip testing and the habitant plant preferences. Despite the unavailability of distilled water, a relative average comparison of the soil varieties indicated that the land soil was 0.7 more acidic than the commercial selection. This slightly acidic soil pH reading is consistent with the flora found growing in the region, as the prolific moss, Labrador tea and blueberry bushes have reported preferences for such. Nonetheless the minimal reading of 5.9 remains non-extreme and thus potentially manageable through the addition of coffee grounds or saw dust. Without more precise measurements overcompensation contributes the greatest anxiety.

Using our Kale plants, the effects of land soil concentrations was tested. Growth recorded as final height was seemingly unimpaired in land versus potting soil. The equal average differential increase in growth rate experienced by the transplanted and non-transplanted individuals in potting soil suggests this action within itself had negligible effects. All of the Kale underwent an increased growth rate during the soil type experimentation. Thus no combination completely excluded growth.

Using earlier growth of each plant as a comparative control, the difference with the test period values for the 5:4 and 3:4 composites (topsoil:land) indicate a slowing rate of increase relative to other plants (1:0, 0:1). This is further substantiated through a direct comparison of each to the pure topsoil growth rates which were 30% (5:4) and 40% (3:4) greater. The lower rate of the composite with less topsoil out of these is congruent with the prediction that soil quality decreases through the addition of greater land derived dirt. The lower growth rate of the 5:4 specimen compared to the 1:1 is an interesting anomaly.

The high growth rate of the land-soil potting (0.9cm/day; similar to the potting rate averages of 0.8cm/day for the un-transplanted 1:0 and 0.9cm/day for the 1:1 individuals) is contrary to expectation. One potential explanation is in the fine nature of the land soil particulate resulting in a dropping soil level and consequently exaggerating height. Additionally it is important to note that height is not the only determinant of health. Leaf discolouration (fading and yellowing) and the appearance of dried patches were observed with the land-soil potted Kale. In general these results advocate the use of a 1:1 blend of soil types as it experienced the greatest increase in growth rate without presenting signs of malady. Greater certainty in this conclusion would be achieved through a greater trial number (to lower the standard deviation).

Figure 7: Soil Collection on Land

Figure 8: Sifting Soil with Window Screen Mesh

	Average Growth Rate (cm/day)	
Transplanted soil blend (purchased topsoil:land-soil)	Before transplanting	Subsequent to transplanting
1:0	0.2 ± 0.03	0.8 ± 0.2
5:4	0.2 ± 0.1	0.6 ± 0.2
1:1	0.4	0.9 ± 0.1
3:4	0.4 ± 0.1	0.5 ± 0.3
0:1	0.2	0.9 ± 0.1

Table 1: Growth rate comparison of Kale transplants

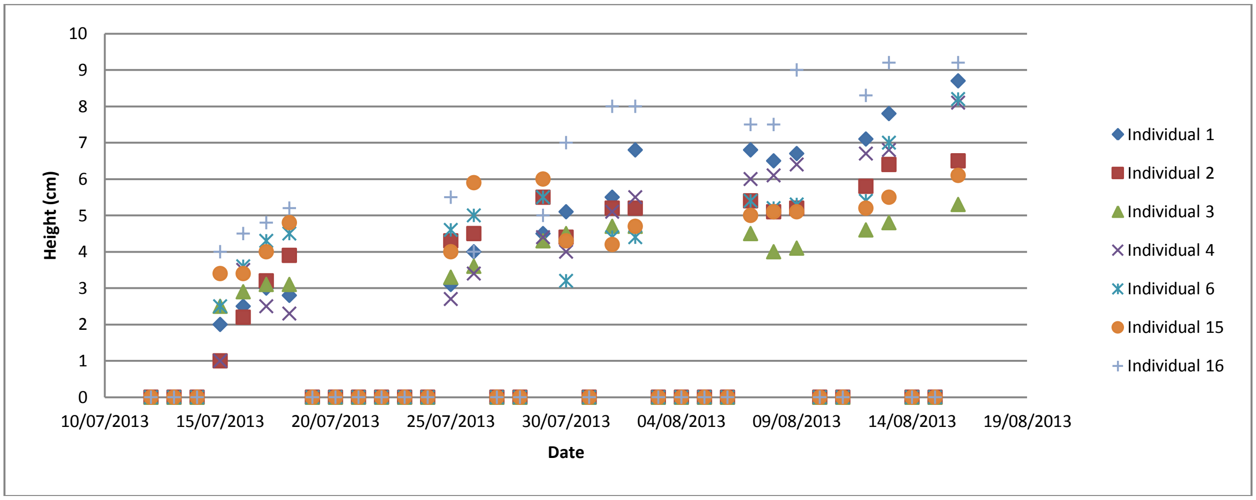

Table 2: Height record of specimen replanted in 1:0 (topsoil:land-soil)

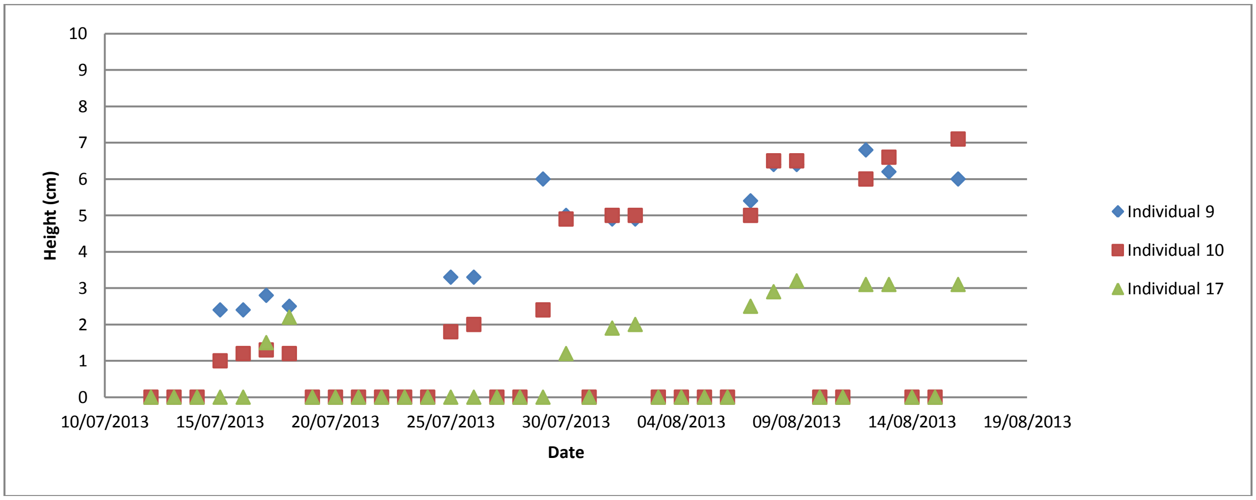

Table 3: Height record of specimen replanted in 5:4 (topsoil:land-soil)

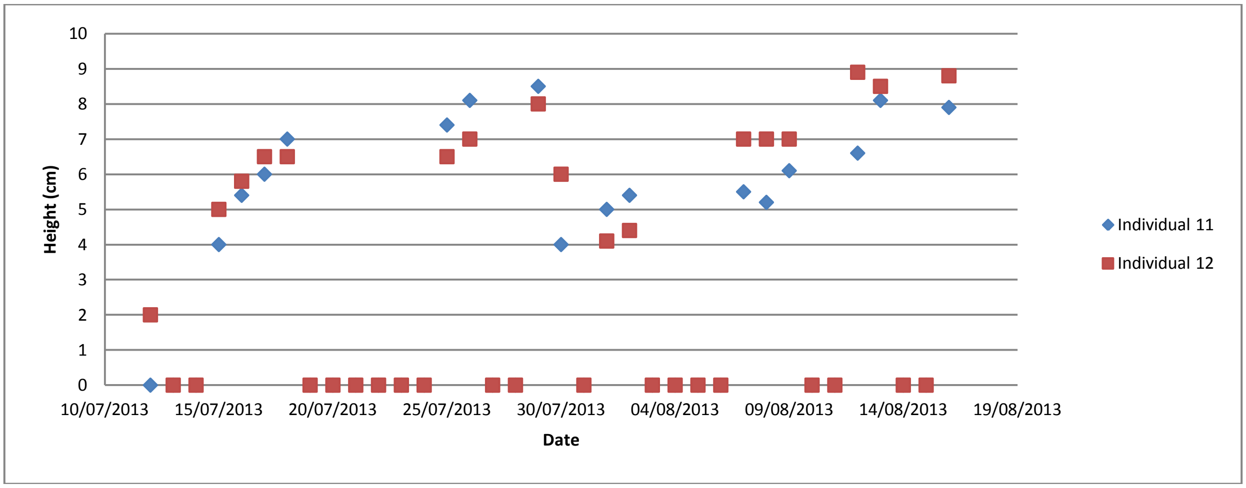

Table 4: Height record of specimen replanted in 1:1 (topsoil:land-soil)

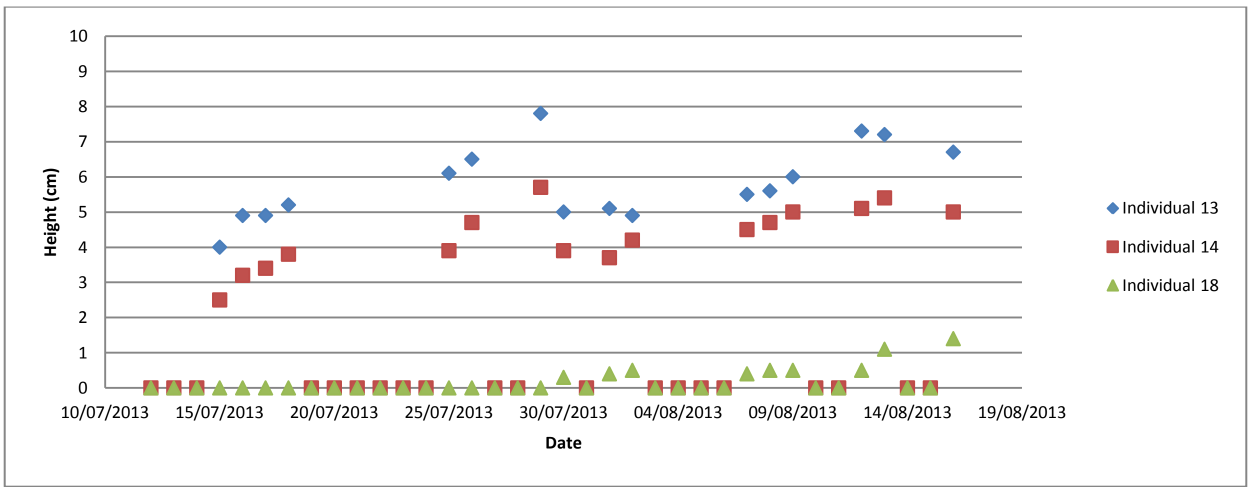

Table 5: Height record of specimen replanted in 3:4 (topsoil:land-soil)

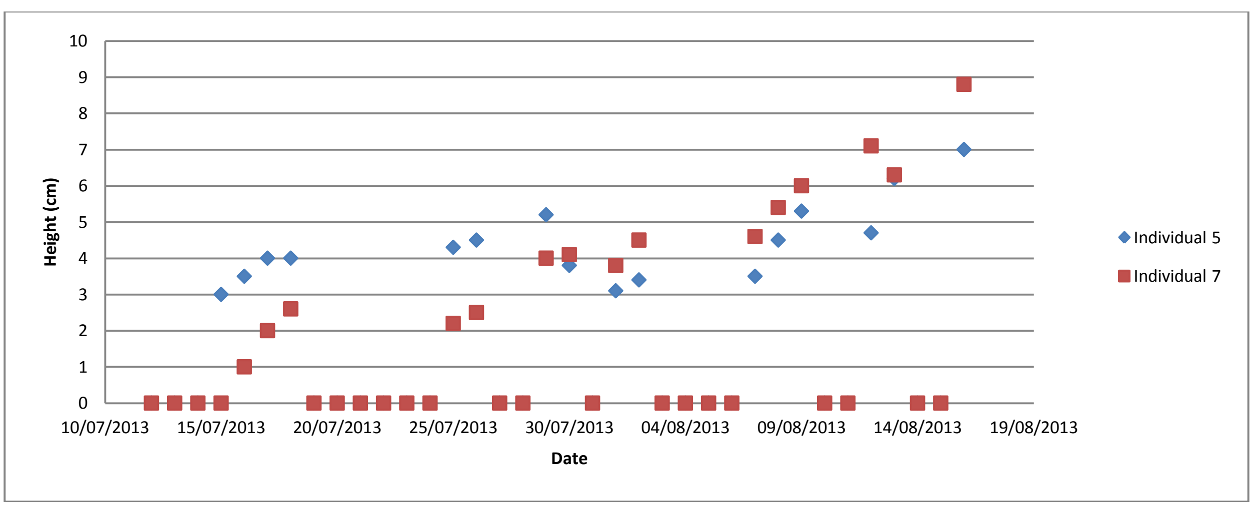

Table 6: Height record of specimen replanted in 0:1 (topsoil:land-soil)

Figure 9: Leaves of the 0:1 (topsoil:land-soil) Kale

Pre-existing Local greenhouse involvement

Two pre-existing greenhouse sites were identified in Arviat, providing existence proof for the general concept's feasibility. Don St John's constructions include an early glass covered deck extension to his house, various outdoor re-claimed material potting structures and a recent separate raised greenhouse poly walled building. Early examination of these and willing advise from the owner were instrumental in the development of our own smaller greenhouses. Contrasting the insulating capacity of the two larger structures, the greenhouse poly was far superior. Additionally the light quality was reportedly of inferior quality within the glass building. The main discouragement brought forth for the synthetic material, was that it occasionally created too high of temperatures, increasing the necessity for good ventilation on hot days. Visits to this site were also a source of early motivation and exposure to the potential of the project for the students.

The second site owned by the St Therese Catholic Church, contained a greenhouse first built by a pastor over 15 years ago, which fell into disuse for a period but has been active for the last two years. The group was permitted to care for the greenhouse plants from 08/07/2013 to 23/07/2013 and visit the site afterwards. Due to the late summer start date, working in this greenhouse, planted in early June, allowed direct experience with growing vegetables, which would otherwise not have been feasible this year. The most important component of this specific venture was nested within its learning and teaching potential, which is indeed necessary for the continuation of such projects. Essential to this was the fostering of an active interest and involvement of the employed local youth. The limited previous experience of many of the workers with any gardening, due to the lack of its history in the region, was improved through active access to non-native plants.

Practicing the measurement of temperature, which reinforced this climatic variables importance to plant growth, an average insulating capacity of 27% was calculated, representing an average interior temperature of 3.5^{o}C greater than the outdoor. These values were recorded across a range of morning and afternoon times, with the outdoor temperature ranging from 7-10^{o}C. However, as replication of this design would be difficult, the primary motive in this was developing systematic recording skills.

Swiss chard, beets, beans, spinach, lettuce, dill and parsley were predominant among the plants grown. Of these some spinach, lettuce, dill and parsley were harvested by the group. The produce was initially given to the summer camp, hoping to encourage vegetable consumption. Many of the students involved who tried the spinach during its collection, were delighted in what constituted their first tasting.

Further plant developmental recording took the form of photography for both sites. This aspect of our project was particularly engaging for many of the participants who were enabled to develop their skills in this art. In performing this non-invasive form of recording, limiting conceptions of the purpose of photography were also challenged through their presentation as scientific practice.

Figure 10: Young Spinach in Greenhouse

Figure 11: Salad Rocket (Arugula) Outdoor

Figure 12: Potato Plants in Greenhouse

Figure 13: Corn Plants in Greenhouse

Figure 14: Strawberry in Greenhouse

Figure 15: Young Zucchini in Greenhouse

Organic Waste disposal and composting

While composting in northern communities engenders many innate difficulties, these factors reciprocally reinforce the demands for such a system. Included among these are cold extremes and the lack of local decomposers.

Barrel Composters

In attempting to maintain a degree of practical simplicity, our larger design was adapted from the basic principles of the online document "How to make a Rotary Barrel Compost" (Hunt, 2013). The first models were constructed from scrape 2"x4"wood frames with parallel cross supports joined by a lower box frame and a top brace, 45 gallon drums and metal piping. However upon filling, excessive contact between the rotating bar and support structure created frictional problems resulting in the plastic drum rotating on the bar rather than in the preferred concerted barrel-bar motion. To alleviate the stress which prevented full rotation, a triangular wedge was added to the side crosses reducing contact area and the wooden barrel-bar attachment rings were tightened. The latter required undersized cutting followed by minimally required sanding to increase resistance to the barrels isolated rotation on the bar. Following the loss of compost from the loading flap, the polyethylene vapor barrier lining edge was replaced with the more durable EK-35 container plastic. Additionally it should be noted that leakage from the aeration from the aeration holes in the barrel sides prevents permanent storage on decks or structures prone to rotting.

Commencing August 5th, 4:00 weekday collection from the CO-OP supplied compost to test our design. Additionally scrapes were obtained from the Healthy Moms, Healthy Babies program weekly and office coffee and tea grounds periodically. Although store refuse is prone to imbalance, accurate record keeping and dispersion between barrels minimize this overtime. Upon filling the first barrel the weighted record suggested the possibility of an acidic element excess. pH correction could easily be performed with coffee grounds. Despite adding an abundance of bread, carbon content also appeared low, likely due to the low density of these natural foods. This may result in an increased sensitivity to pH imbalance, reinforcing the need for monitoring. Further compositional analysis should be completed at a later date, as longer durations are required for effective assessment of decomposition.

Of the various systems of implementation, a seasonal approach would allow the easiest transition. The short warm season is limiting. To reduce interterm delaycompost collection should begin early in spring, hoping to achieve full volume by the final frost when these goods can be transferred to their bins. Without heated winter storage, the microbial colonies will be unable to persist and decomposition will halt. If the composters are allowed to freeze, this will cause further thawing delays the following year. Regardless, some form of storage perhaps in a garage or a "seacan" has been advised to prevent polar bear attraction. Speaking to Jim Little, involved in the Iqaluit composting project a prediction of >2 years for soil production was suggested. During the intervening time frequent spinning aeration and ensuring of excess fluid drainage are vital. This fluid may be suitable for natural fertilizer if collected. Year round housing capable of potentially greater accommodation and decomposition, the ultimate aim in removing organic wastes from the dump site, would be a progression upon this through higher investment.

Figure 16: Almost Full Barrel Composter

Figure 17: Barrel Composters

Vermicomposts

Vermicomposting provides an indoor complementary process to barrel composting, most appropriate for small capacity household waste management. Integration into the schools is planned to facilitate the necessary testing and general concept promotion. By giving our vermicompost systems into the care of specific classrooms, students will be encouraged to bring compost to school easing its collection, while learning how to care for the worms. The primary obstacle to this was in worm acquisition. An order placed by the high school filed to materialize preventing summer initiation. Further inquiry directed to specific suppliers may be necessary as online shipping excludes Nunavut, likely due to the hazards of live shipments over large distances. A possible alternative would be to request incoming teachers to bring worms with them. Standard earthworms were located, however, red wrigglers would be more appropriate for efficient composting. Nonetheless mealworms and bait worms allowed interaction and care simulation for the summer students. Once the other worms are found, early population growth will be essential to success, thus early processing is likely to be minimal, subject to gradual improvement. The boxes follow a standard design with two housing functional compartments constructed with doubled 1”x3”boards lined with window screening mesh with ¼”punctured access holes. There is also a bottom drip tray built with a single 1”x3”height, a plywood base and a polyethylene vapor barrier lining. The access holes allow inter-compartment movement, however, facilitated drowning in the drip fluid is a concern, suggesting periodic removal is advisable (this may be used as fertilizer). Construction of the planned larger kitchen vermicompost has been delayed until worms have been located.

Figure 18: Vermicomposter

Figure 19: Open Vermicomposter

Food Storage

Traditional Freezers

By improving dog food storage methods, such products may be vacated from the community freezer facilitating greater use for human consumption. To achieve this we used adaptations upon traditional techniques which harness the cooling capacities of permafrost. The chief guiding factors were to construct something that would prevent polar bear attack, and to prevent spoiling while maintaining accessibility.

The initial plan was to use reclaimed EK35 road maintenance bins with two sides removed to allow access and contact with the earth bottom placed back in their original metal framing for support and with metal doors (constructed from 2"x4"boards and furnace wall plating) directly affixed. This structure would then have been dug into the ground and covered with turf leaving a stairway entry open to the door. However this simple design left the stairway entry unprotected, and was therefore liable to be snowed in preventing winter access. A revision of this was to build a wooden box entryway with a slanted top with a door which is placed between two of the EK35 bins. This allows access from the above and eliminates the necessity to dig a stairway. A Step placed in the center of this compartment eases the lowering mechanism of entry while a 2'x 22"cut-away in each side enables food to be removed from the freezer boxes while maintaining maximal structural stability of the entryway structure. The doors chosen were from old freezers, providing appropriate insulation.

Two of these structures are being provided to dog team owners for testing purposes before further construction is completed.

Figure 20: Wooden Box Entryway

Figure 21: Bin Freezer

Local Plant Usage

Land trips and plant research

This component of our project was primarily enacted during the day trip on 24/07/2013. Our primary goal was to increase student familiarity with the local plants often overlooked in the overwhelming focus of hunting and berry picking with the majority of excursions. In doing so we employed introductory exercises in basic ecology principles. Firstly students identified or drew plants which interested them and practiced matching specimen to guide book descriptions and images. Expanding upon this they used measuring tape to attempt line transact population estimates and built a $1m^2$ quadrat from 1”x3”wood to try this alternative method. The relative merits of each method was thus explored. For most of the berry plants, mosses and lichen percent coverage using a quadrat was easiest. While a line transact was suitable for rarer species, dwarf birch, sandwort and arctic willow. Fireweed, one of our focal edible plants, presented a particular challenge as individual identification is complicated by vegetative expansion. This favouring of quadrats links well with the low growth, shrubbery nature of the tundra flora.

Photography played an important role in our recording, enabling us to identify a maximal number of species through continued off site inspection. Despite early difficulties in focusing and taking representative photos, encouraging improvement under direction was witnessed. Another key aspect in this excursion was simple GPS training, as use of such technology will greatly assist in directing future harvesting and could aid in the monitoring of any detrimental effects of harvesting that may occur in future projects.

Guiding this current research a series of elder’s interviews were performed and two local elders took us on a brief tour of some of the plants which they remembered using on the land. Audio recording of the interviews and video recording of the land based element were taken. Further use of this information is awaiting its transcribing and subsequent translation.

Also a brief study into habitat preferences was started by locating plants within town and the differences in their immediate environs. The majority of plants found fit into either primary successional favoured sandy areas (e.g. road edges or between buildings) or larger and less disturbed high moisture pond regions with limited acidic soils (field behind the “Quickstop”). A local map supplied by the hamlet office aided in focusing this. Starting 10/07/2013 this actually preceded the land trip and was principally characterised by initial preparatory work.

Figure 22: Dwarf Fireweed

Figure 23: Arctic Cotton

Figure 24: Buttercup

Figure 25: Quadrat identification

Figure 26: Elder Teaching Traditional Plant Use

Harvesting and Preservation

As an introduction to and exploration of relevant techniques, actual gross processing was limited this year. The three focal plants chosen were Fireweed (both dwarf and full-grown varieties), Seaside sandwort and Arctic willow. This decision was driven by edibility, past use and availability. Samples of each were obtained from sites of high natural abundance (the point for sandwort, the point and off the main road exiting town for fireweed and the latter road for arctic willow). Collection involved manually cutting stems at intervals aimed to reduce damage. For sandwort it was found that this may be eased by modest digging near the roots. For arctic willow some leaves were collected without removing branches as this portion of the plant has the greatest palatability.

The trial preservation methods chosen were screen drying, hanging drying and freezing.

An interesting progression upon this would be to collect the seeds of these plants and attempt to cultivate them. This may be a suitable activity for the schools to investigate.

Figure 25: Seaside Sandwort Before Harvesting

Figure 26: Full-grown Fireweed Harvesting

Figure 27: Drying Dwarf Fireweeds

Figure 28: Seaside Sandwort Before Freezing

Local Food Habits

Survey

A survey concerning current and past vegetable consumption with a section dedicated to the assessment of community willingness to be involved in our composting and gardening initiatives was distributed during the week of August 20th in the Northern entryway and local offices. The data from these will be instrumental in appropriate continuation of this project and planting next year.

Here are some of the main results:

Food habits of the Arviat population

Total surveys:		105						
Gender:		**Male**		**Female**				
		44		61				
Age:	**15-20**	**20-30**	**30-40**	**40-60**	**60+**			
Men	4	20	2	14	4			
Women	8	26	2	21	4			
Education Level:		**No Diploma**		**High School**		**Secondary**		
		14		49		42		
Children at home:								
Zero	**One**	**Two**	**Three**	**Four**	**Five**	**Six**	**More**	
37	17	12	8	9	11	6	5	
How often did you eat plants or vegeatables in your childhood?								
	Everyday		**Every other day**		**Twice a week**		**Once a week**	
	27		33		22		5	
	Every other week		**Once a month**		**Never**			
	2		11		5			
Where did these plants or vegetables come from?								
	Stores		**Home grown**		**Gathered from the land**			
	88		14		20			

How often do you eat plants or vegeatables now?								
	Everyday		**Every other day**		**Twice a week**		**Once a week**	
	31		36		17		3	
	Every other week		**Once a month**		**Never**			
	5		11		1			
Where do these plants or vegetables come from?								
	Stores		**Home grown**			**Gathered from the land**		
	91		9			18		
If they are from the land, who taught you about the edible species and their location?								
	Family		**Friends**		**Books**		**Others**	
	60		26		20		14	
How many recipes do you know that use plants or vegetables?								
Zero	**One**	**Two**	**Three**	**Four**	**Five**	**Six**	**Seven**	**Eight +**
10	7	8	12	6	9	2	2	49
Where did you learn these recipes?								
Family		**Friends**		**Cookbooks**		**Others:**		
80		44		41		6		
How many people do you know that eat plants and vegetables everyday or every other day?								
Zero	**One**	**Two**	**Three**	**Four**	**Five**	**Six**	**Seven**	**Eight +**
10	3	11	8	16	5	2	2	48
What do you think of the store prices of vegetables?								
	Expensive		**Reasonable**					
	73		32					

How much do you spend on food weekly?

$100 -	$200-$300	$300-$400	$500 +	No answer
12	30	15	41	7

Do you think these foods are healthy or unhealthy?

Food item	Healthy	Not healthy
Burger	14	91
Fruits	105	0
Pizza	39	66
Chips	7	98
Vegetables	103	2
Candy	5	100

Have you grown vegetables before?

Yes	No
33	72

Would you be willing to grow vegetables at home if we gave you the materials?

Yes	No
68	37

Would you be willing to bring your organic wastes to a compost collection site?

Yes	No
77	28