

# HOW CAN CITIES GROW VEGETABLES TO FEED THEMSELVES IN WINTER?

## GREENHOUSES



Living in Saskatchewan is always a challenge for growing food locally because of our extreme climate. By using greenhouses, there is a possibility that we could grow fruits and vegetables all winter long.

There are two types of greenhouses: glass and plastic ones. Greenhouses work by incoming visible sunlight being absorbed into the greenhouse. This warms air inside the structure and helps the food produce. Greenhouses take up a lot of space and use a lot of electricity for lighting and heating the greenhouse.



## ROOFTOP GARDENS



For our project we decided to grow a garden right inside our classroom. What we are trying to discover is whether we can grow vegetables in the winter or not and how much. We are growing everything in gardening pots and are using grow lights. We are experimenting with many different plants like squash, cucumbers, carrots, kale, bean fava and bean pole. We noticed that beans, both pole and bush, are sprouting slower than others.

Another way to help us eat locally is people could start growing vegetables in their houses. There are many things you can grow like herbs, greens, lettuce and chili peppers all produce better than exported on a windowsill. They will grow better in the summer when the days are longer and the light is more intense. It will need a little help by using artificial light. I can be as simple as a full spectrum bulb in a cheap shop light. The plants will not stay alive forever even indoors. You have to make sure the plants are getting good drainage, water and as much sunlight as possible. You could

A rooftop garden is a garden that is on top of a building. Besides the obvious benefits, rooftop gardens provide food, temperature control, hydrological benefits, architectural enhancement, habitat for birds and insects.

**Geep** GLOBAL ENVIRONMENTAL EDUCATION PARTNERSHIP

Sharing ideas to create a more just and sustainable future through the power of environmental education

## CASE STUDY

Photos: (l) Angie Bugg; (r) Shannon Dyck

# Building Capacity for Sustainable Action through Inquiry, Experiential Learning, and Collaboration

*Student Action for a Sustainable Future*

Saskatoon, Canada

### CONTRIBUTORS

[Shannon Dyck, Environmental Coordinator](#)  
[City of Saskatoon, Environmental & Corporate Initiatives](#)

[Marcia McKenzie, Director](#)  
[Sustainability Education Research Institute, University of Saskatchewan](#)

GEEP is a partnership of the U.S. Environmental Protection Agency, the Environmental Protection Administration of Taiwan, and the North American Association for Environmental Education.



**Building Capacity for Sustainable Action through Inquiry, Experiential Learning, and Collaboration—*Student Action for a Sustainable Future***



GOALS KEY

[United Nations Sustainable Development Goals](#) addressed

Overview

This case study explores Student Action for a Sustainable Future, a comprehensive environmental education program for middle school students that takes place in the city of Saskatoon, the largest city in the Canadian province of Saskatchewan.

The Student Action for a Sustainable Future (SASF) program engages grade 5-8 classrooms in action and inquiry projects in the areas of waste, water, energy, food, biodiversity, and transportation. Twelve teachers are accepted each year that represent a balance of school divisions, grades, and school locations. Participating teachers are provided with support, resources, professional development, planning time, networking opportunities, action project funds, and access to sustainability and environmental experts. At the end of the year, the students highlight their experiences and results at a student showcase, which provides an exciting and celebratory event for everyone involved.

**The program focuses on the following objectives in order to support teachers and students to work towards outcomes that impact their classrooms, schools, households, and the community at large:**

- Providing a framework that is adaptable to the participants’ needs, interests, and context;
- Including youth in the decision-making process;
- Using inquiry to guide both the process and results of the program;
- Planning environmental action projects, and then acting on those plans;
- Striving towards environmental outcomes that are measurable, experiential, and place-based;
- Making connections and developing partnerships with community members and organizations;
- Integrating multiple ways of knowing, with a particular focus on Indigenous ways of knowing and being;
- Engaging youth and teachers in politics;
- Making strong links to curriculum; and
- Responding to the goals set out in the City of Saskatoon’s Strategic Plan.



Photo: Angie Bugg

## Background

The Student Action for a Sustainable Future partnership includes formal educators, non-formal educators, local government, and community based organizations. Through a shared interest in both education and sustainability, the partnership was formed in 2012 with the purpose of developing a pilot program that would help the City of Saskatoon achieve its environmental mandate and greenhouse gas reduction targets, while also building student and teacher capacity to take action. Partners include the City of Saskatoon, Saskatoon Public School Division, Greater Saskatoon Catholic Schools, Saskatchewan Environmental Society, Sustainability Education Research Institute (SERI, University of Saskatchewan), Saskatoon Light & Power, and 14 community based organizations. The City of Saskatoon remains the primary funder, while the Saskatchewan Environmental Society plays a leading role in program delivery.



Photo: Angie Bugg

*The SASF program draws upon the strengths of its partners to offer diverse opportunities, knowledge, ways of understanding, and skills, which brings relevance and meaning to student and teacher learning.*



# Outcomes/Results

The Saskatchewan Environmental Society works with each classroom to conduct environmental audits, which have been developed for each of the 6 program areas (waste, water, energy, food, biodiversity, and transportation). This allows classrooms to measure the impacts of their actions on factors such as energy consumption, water use, fuel use, the waste stream, and greenhouse gas emissions:

	2013-14 SCHOOL YEAR		2014-15 SCHOOL YEAR		2015-16 SCHOOL YEAR	
Electricity	17,000 kWh	\$1,160	18,600 kWh	\$1,270	32,500 kWh	\$2,400
Gas	88 GJ	\$230	No Projects	No Projects	No Projects	No Projects
Water	700 m3	\$1,800	350 m3	\$900	150 m3	\$400
Fuel (gasoline)	230 L	\$230	500 L	\$500	1,800 L	\$1,800
Waste	8,000 kg	—*	2,210 kg	—*	7,300 kg	—*
Greenhouse Gases	28,850kg CO2e	—*	18,660kg CO2e	—*	39,500kg CO2e	—*

\*Not available

The audit process has been an effective way of engaging students in “real-world” solutions and experiential learning. Some of the action projects that have contributed to positive environmental outcomes include:

- Developing a bike generator to charge cell phones;
- Setting up vermi compost and recycling systems;
- Reducing idling in front of their schools by talking to drivers and putting up Idle Free Zone signage;
- Growing vegetables and micro-greens in their classrooms;
- Creating an Indigenous Healing garden in their school yard;
- Building solar ovens;
- Installing LED lights;
- Doing home water and energy audits and conserving water and energy at home; and
- Holding school wide lights-out competitions.



Photo: Shannon Dyck

So far, the program has reached 43% of the elementary schools within the Saskatoon Public School Division, and 38% of the elementary schools within the Greater Saskatoon Catholic School’s jurisdiction.

*Celebration is key. The student showcase allows everyone to come together and celebrate their accomplishments. Students are excited to share the results of their work, while attendees are inspired by what’s possible in our communities.*

# Evaluation Plan

Student and teacher surveys are used to better understand the results of the program, participant experiences, and program successes. The survey tool also helps provide the story, context, and meaning behind the quantitative environmental audit data. The results are used to communicate the accomplishments of the program to stakeholders and the public, build and maintain support for the program, attract funding and in-kind resources, and assess where improvements or changes to the program may be required.

## The teacher and student surveys have revealed that:

- Teachers' comfort levels with teaching sustainability and other environmental issues have increased;
- Students' understandings of the importance of living more sustainable lives have increased;
- Teachers agree that the SASF program will leave a lasting legacy; and
- Students are engaged in their learning:
  - *The projects were fun!*
  - *I learned a lot of interesting things*
  - *I enjoyed learning this way*
  - *I felt encouraged to be a leader in sustainability*
  - *I like that I got to spend time with friends*
  - *I feel like I made a positive impact on the earth*
  - *I feel like I made a positive impact on others*
  - *I like that other people were interested in our projects*
  - *I enjoyed the year-end student showcase*

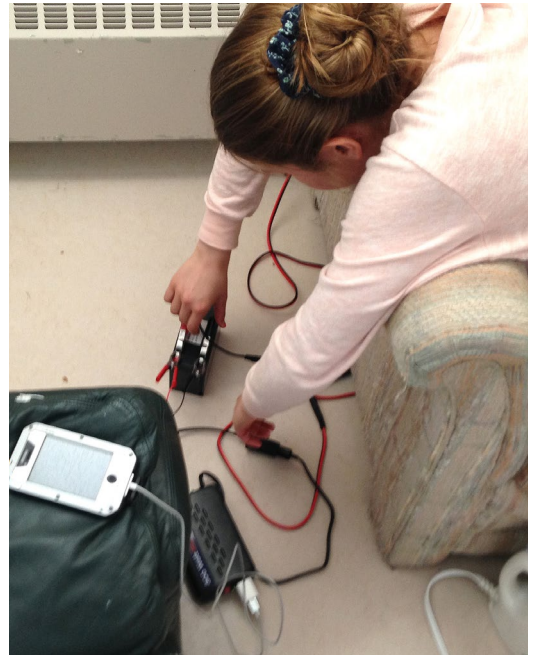
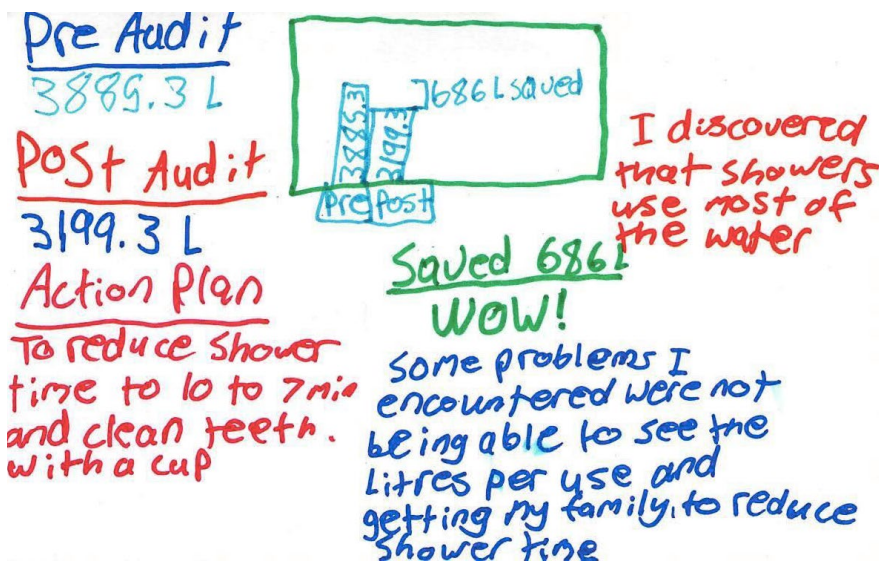


Photo: Deb Hockley

Although the lasting impacts of the program are not being measured at this time, we have started to survey past participants to understand what has continued from their participation in the program. A teacher website has also been created that includes resources, a sharing platform, project ideas, and more. We believe it will become a way to maintain relationships with past participants, evaluate teachers' continued involvement in sustainability, and assess whether teachers continue to use what they learned in the program in years following completion.

## Lessons Learned

At a time when measurement is becoming increasingly sought after by our educational, political, and corporate institutions, building some level of quantitative and qualitative analysis into our educational programming can help attract funding, gain and maintain support, and showcase the benefits of our work. It has also been used in the SASF program to help students and teachers understand that the actions they and others take (or do not take) can have a very real impact on the environment.



*Students and teachers have a voice that can influence the direction of our communities. As they discuss their ideas and knowledge with other people and model sustainable behaviours in their day-to-day lives, they are leading to a shift in their classrooms, homes, schools, and communities.*

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saskatoon.ca/studentaction



However, the value of the SASF program cannot simply be expressed through measurement. As prominent environmental educator, Arjen Wals, notes, "What you can't measure, still exists." There are numerous outcomes, benefits, and successes of the SASF program that are not measurable or that the partners feel would not benefit from being assessed in such a manner. It's the compelling stories, new relationships, meaningful experiences, and improved confidence to participate in sustainable solutions that will leave a lasting legacy, build people's capacity for future action, and contribute to the cultural shift that is necessary in our communities to address sustainability in a holistic manner.

Over time, it is hoped that more programs like this are developed and delivered until, eventually, they are seen as "business-as-usual." If we are serious about sustainability, we cannot simply focus on producing immediate results. We must be looking at how to build capacity for future action and engagement. We hope that this program influences long-term thinking, actions, and values that contribute (and continue to contribute) to a more sustainable way of living.

# Resources

## **Main page:**

Student Action for a Sustainable Future:

[www.saskatoon.ca/studentaction](http://www.saskatoon.ca/studentaction)

## **Partners:**

Saskatchewan Environmental Society:

[www.environmentalsociety.ca/programs/k-12-school-programs/sasf](http://www.environmentalsociety.ca/programs/k-12-school-programs/sasf)

Saskatoon Public Schools:

[www.saskatoonpublicschools.ca/Board/celebratingexcellence/mar25/Pages/default.aspx](http://www.saskatoonpublicschools.ca/Board/celebratingexcellence/mar25/Pages/default.aspx)

Greater Saskatoon Catholic Schools:

[www.gscs.ca](http://www.gscs.ca)

Sustainability Education Research, Institute University of Saskatchewan:

[www.seri.usask.ca](http://www.seri.usask.ca)

Saskatoon Light & Power:

[www.saskatoon.ca/services-residents/power-water/saskatoon-light-power](http://www.saskatoon.ca/services-residents/power-water/saskatoon-light-power)

## **More information:**

[www.ecofriendlysask.ca/2014/04/we-are-eco-mean-but-global-green.html](http://www.ecofriendlysask.ca/2014/04/we-are-eco-mean-but-global-green.html)

[www.saskwastereduction.ca/events/swrc/waste-minimization-awards/2013-waste-minimization-awards](http://www.saskwastereduction.ca/events/swrc/waste-minimization-awards/2013-waste-minimization-awards)

## **Contact:**

Shannon Dyck

Environmental Coordinator

City of Saskatoon, Environmental & Corporate Initiatives

(306) 975-2331

[Shannon.dyck@saskatoon.ca](mailto:Shannon.dyck@saskatoon.ca)

Deb Hockley and Angie Bugg

Saskatchewan Environmental Society

(306) 665-1915

[sasf@environmentalsociety.ca](mailto:sasf@environmentalsociety.ca)

