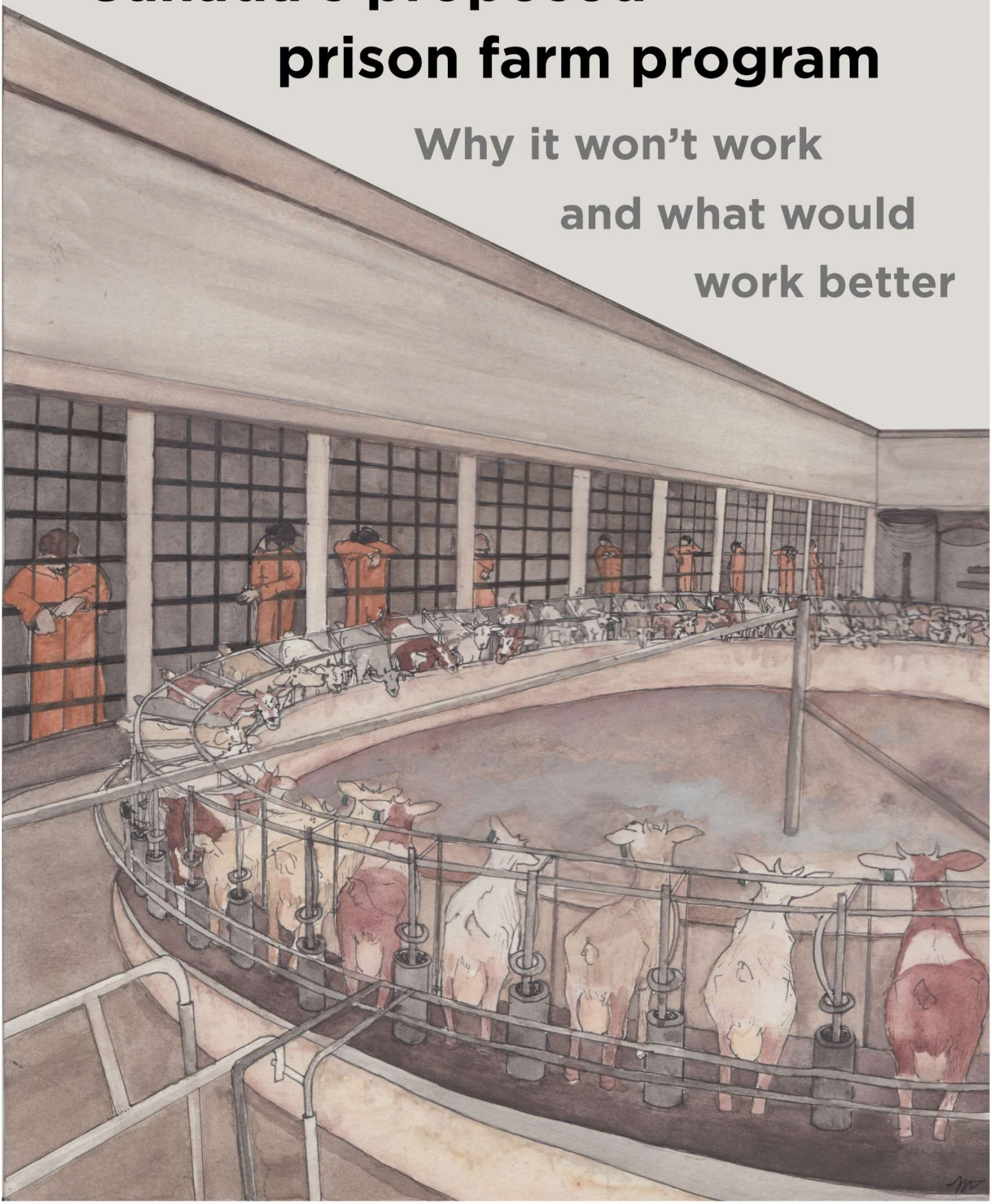
Canada's proposed prison farm program

Why it won't work and what would work better



Canada's proposed prison farm program: Why it won't work and what would work better

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PART ONE

The shortcomings of Canada's prison farm model

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PART TWO

A framework for transforming Canada's prison farms

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This report was commissioned by Evolve Our Prison Farms

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EXECUTIVE SUMMARY AND RECOMMENDATIONS

In 2018, the federal government announced a plan to re-open prison farm programs at two federal penitentiaries in Kingston, Ontario: Joyceville and Collins Bay. These farm programs will not be in the form they had been prior to their closures in 2010, but will instead be centered around an industrial-scale goat dairy for commercial sale.

This report provides a detailed analysis of the farm program that the Correctional Service of Canada (CSC) is planning to launch in the 2021 fiscal year. Drawing on empirical research, Part One examines the foreseeable problems with the goat dairy plan. Part Two presents alternatives that offer more positive impacts on prisoners,[1] the planet, and society as a whole. This report will be of interest to numerous and varied constituencies, including prisoners, prison justice advocates, unions representing workers inside the participating penitentiaries, the communities surrounding the proposed farm programs, taxpayers concerned about fiscal responsibility, politicians, policy makers, environmentalists, animal advocates, and the Canadian commercial goat industry. Our primary hope, however, is that this thorough analysis will cause CSC decision-makers to pause and re-evaluate their plans, which would be prudent considering the content in Part One.

Part One points to significant foreseeable problems with CSC's plan for the farm program, focusing on three key areas of impact: prisoners, institutions (and CSC), and surrounding communities.

Impact on prisoners: Our analysis highlights two main issues of concern here: failure to meet the stated objectives; and potential contravention of human rights.

The stated purposes of the farm programs – vocational training and rehabilitation as means to the end of reduced recidivism – are not in alignment with the likely consequences. Simply working while behind bars does not translate into reduced risk of recidivism. What can help is the provision of value-added employment experiences, such as receiving certification that opens doors to employment opportunities that are stable and enriching. Our analysis indicates that employment in the livestock industry does not meet these criteria. Moreover, employment opportunities in the dairy industry are not plentiful and are not expected to expand (as opposed to other agricultural sectors, such as greenhouses and nurseries), and employment in the industry is characterized by relatively high rates of injury and illness. There is also no empirical evidence to suggest rehabilitative impacts of working with animals in industrialized animal agriculture.

The second main concern that we identify vis-à-vis prisoners is that their human rights may be compromised. Prisoner wages, security, benefits, and occupational health and safety are not comparable with what a free labourer producing dairy for commercial sale would experience. The absence of evidence of a rehabilitative function in the case of working on an industrial goat dairy obviates claims that this work is primarily for the purposes of rehabilitation and therefore need not comply with standard workplace practices and remuneration.

[1] Many terms are used interchangeably for people who are incarcerated, including "prisoner," "inmate," and "offender." While we favour the term "federally incarcerated persons" as used by the Standing Senate Committee on Human Rights, for the purposes of brevity we have adopted the term "prisoner" throughout this report.

Impact on the institutions: Due to the number of animals projected to be on the premises, heightened risks of virus spread and diminished air quality can be expected. Depending upon the proximity of the farms to the general prison population and correctional staff, they could be exposed to these risks as well; the staff working on the prison farms certainly would be.

Large concentrations of animals under stress are well known to breed viruses. The origin of many zoonotic illnesses (i.e., those that breach species boundaries) can be traced to intensive livestock operations. Evidence examined in this report documents increased risk of contracting these viruses among those who work in intensive livestock operations, as well as increased risk of transmission to those they cohabitate with. Not only are they at risk of contracting and transmitting viruses from the animals they work with, they are also at risk of transmitting zoonotic illnesses that originate from other animals, such as COVID-19, due to the nature of the work conditions. Having a dairy facility in a prison brings into convergence two populations that are vulnerable to viral transmission: those employed in the industrial animal agriculture sector and those in prisons. During the preparation of this report, there was a sizable COVID-19 outbreak at one of the institutions where the prison farms are slated to open.

To make matters worse, compromised air quality in intensive livestock operations (attributable primarily to bioaerosols and dust) increases the risk of several respiratory illnesses, notably of the type that would constitute an underlying risk factor for developing complications from COVID-19.

There are also a number of exogenous factors that could complicate matters significantly, and it is unclear if or how CSC plans to deal with them: who will care for the animals in the event of a lockdown or outbreak of illness; what will happen to the milk if there are disruptions in the dairy market; and will prisoners be charged with destroying animals if there is an outbreak of deadly illness (e.g., scrapie) in the goat herd? Even in the unlikely absence of unforeseen complications, standard practices associated with such operations merit consideration. Will the prisoners be the ones performing the painful disbudding/dehorning of the goats undertaken when large numbers of goats are kept together? What will happen with the male and excess female goats that are not useful for dairy production? And what will CSC do with the immense amount of manure that the goats will produce – manure that can contain harmful substances? This question is particularly pertinent given that an environmental assessment of the Joyceville prison, reviewed in this report, references an area of potential environmental concern surrounding a manure lagoon used by the former livestock farm at the site.

Impact on the broader community: Finally, our analysis points to potential implications for the communities surrounding these prison farms. Risks to air and water quality could extend beyond the prison walls, as could odour.

These externalities have been demonstrated in the literature to negatively impact property values surrounding intensive livestock operations. A goat dairy of the size that is in the works could also have a negative economic impact on the commercial goat dairy industry, which according to our analysis is already facing a number of uncertainties due to a significant increase in production in the past few years that has outpaced demand.

After delineating the potential issues facing the proposed farm programs, Part Two outlines three distinct but interrelated alternative program models for CSC's prison farms: (1) organic fruit and vegetable production for prisons and community organizations; (2) horticulture therapy; and (3) agri-food education and training. These models represent the most promising and effective path forward for the prison farms, balancing benefits for prisoners, advancing CSC's overall objectives, and making positive contributions to the broader community and the environment. Taken together, these models offer a framework to develop a sustainable and beneficial prison farm program supporting prisoners and the broader community, and contributing to the health of our environment.

Our analysis and recommendations are based on available research and evidence used to identify promising practices for a renewed prison farm program in Canadian federal prisons.

Recognizing the existence of much deeper challenges with Canada's carceral system, our approach to the prison farms is to explore how they could be transformed to improve the lives of prisoners, while recognizing that the Canadian prison system must undergo a much broader transformation to rectify other harms.

The general principles adopted in this report include the following:

- The prison farms should have a non-profit mandate.
- The farms should have tangible and direct benefit to prisoners, including:
    - Providing healthy and nourishing food for prisoners
    - Employing them under fair labour conditions, including appropriate compensation
    - Providing relevant and meaningful training, education and rehabilitation
- Ideally the farms will benefit the broader community.
- The farms should be environmentally sustainable and regenerative.
- The use of animals should be limited to therapeutic purposes.

The recommendations for food production outlined in the report include:

- An organic, diverse agriculture model involving a mix of permanent raised beds, intensive market-garden and field crops.
- Focus on producing food for prison kitchens, as well as distributed to community food organizations.
- Focus on annual fruits and vegetables that can be eaten fresh or with minimal preparation, alongside the development of perennial fruits as well as native trees and shrubs.
- Development of season extension through greenhouses and/or storage facilities to promote year-round training, education and employment opportunities.

We also make the following recommendations for education and training:

- A holistic approach should be adopted, one which includes providing education opportunities, job skills training in industries that show promise of stable employment opportunities and a safe workplace, and pre-release/post-release jobs and/or internships in these industries.
- Ensure any training received is seen as credible, and provide support to prisoners with job attainment (résumé writing, interview skills etc.) as research indicates these supports are key.
- Partner with local institutions and organizations, where possible.
- One model that would be particularly useful to employ is the farm-to-table approach that encompasses culinary training, small scale food processing, and agriculture and horticulture activities.

Finally, the report provides the following recommendations for developing a horticulture therapy program:

- It should entail organic and manual production methods on both in-ground and raised bed garden infrastructure.
- Infrastructure such as a greenhouse and indoor learning space should be utilized in order to accommodate year-round programming.
- Establish community partnerships to facilitate programming, provide food for organizations in need, and bridge community-prisoner relations.
- Begin enrolment with a maximum of 25 participants in the program and through referral from the prison therapist.
- The program should be overseen by a horticultural therapist, or therapist trained in horticultural practices and program implementation.
- It should have a rehabilitative focus, aimed at improving participants' social and cognitive skills, confidence, self-esteem and motivation.
- It should incorporate Indigenous cultural and healing processes throughout.

While this report identifies several foreseeable problems with the prison farm program CSC currently has planned, we nonetheless think that re-opening the prison farms in a different form, such as those recommended herein, would present CSC with a historic opportunity to establish itself as a leader in innovative rehabilitation and reintegration programing, based on best evidence, active community collaboration, and environmental stewardship.

INTRODUCTION

In their 2018 budget, the Federal Liberal Party announced its plan to allocate $4.3 million CAD over the ensuing five-year period to reopen the prison farm programs at the Joyceville and Collins Bay federal prisons in Kingston, Ontario that had been ordered closed in 2010 by Stephen Harper's Conservative government.

The stated purpose of the programmatic revival provided in the budget was "to provide federal inmates with training opportunities to acquire new skills, while preparing for employment and successful reintegration and rehabilitation into the community" (2018, p. 210). Since that time, Access to Information requests have provided internal documents indicating that Correctional Service Canada's (CSC) capital budget will be used to cover additional costs of $9.75 million (Cumming, 2020a).

CSC's plan is to open an industrial livestock operation, stocked primarily with goats to produce milk. According to the Nutrient Management Strategy (2019) conducted for CSC by a third party, the plan is to have 90 dairy cows (calf "by-products" are not included in this number) and 2200 milking goats (plus unweaned offspring) on site by August 2023. Thus far, two requests for proposals have been posted by CSC to acquire female goats "to commence with up to 800 kids in 2020" (CSC statement to Evolve Our Prison Farms, June 18, 2020). As of the time of this writing, no goats have yet been acquired.

The eventual maximum number of goats kept on the farm post-2023 is unclear. A government solicitation for "Dairy bulk coolers" for the new facility[2] indicates that "at max production, an estimated 2,250 litres per hour of goat milk will be going into the larger tank and an estimated 900 litres per hour of cow milk will be going into the smaller tank. These estimates are based on a 2-hour milking schedule for goats and a 1-hour milking schedule for cows." Based on industry estimates,[3] this maximum production level would require a herd of 3200 goats in active milking; these numbers do not include the number of kids (baby goats) that will be a by-product of this process (in practice goats are impregnated annually in order to keep milk production high). It is estimated that the production of 900 litres of cow milk will require 60 dairy cows in active milking. This milk will be designated as research quota (i.e., not for public or prison consumption), although at the time of this writing, and to the best of the authors' knowledge, the research quota has not yet been assigned (Dairy Farmers of Ontario statement, October 7, 2020). "Beef cattle" have also been acquired: 17 in 2019, sold the same year, followed by 19 bull calves, with five surviving after CSC confirmed a series of calf deaths over the first several months of 2020 (CSC statements to Evolve Our Prison Farms). No cause of death has been provided.

What will happen with the final products is also unclear. Due to the Food Service Modernization Initiative implemented by CSC after the former prison farm closures, the products of the new farm

[2] This document is available at: https://buyandsell.gc.ca/cds/public/2018/12/17/aa23764efb657e0605006c7f7c56a263/ABES.PROD.PW_KIN.B630.E7646.EBSU001.PDF

[3] Consultations with Ontario Goat.

program will not be consumed by prisoners. It has been reported (Allen, 2019, citing Mark Gerretsen, MP, Kingston and the Islands) that the expected purchaser of the prison-produced milk is Canada Royal Milk, an infant formula company that is run by Feihe International, a Chinese company, although at the time of this writing CSC has no finalized contracts.

As we discuss in this report, there are aspects of the proposed farm program that we expect will result in legal challenges from various constituencies. Some of the many constituencies we expect will be interested in the findings laid out in this report include: prisoners, prison justice advocates, unions representing workers inside the participating penitentiaries, the communities surrounding the prison farms, taxpayers concerned about fiscal responsibility, environmentalists, animal advocates, and the goat industry in Canada, to name but a few.

The purpose of this report is to analyze the proposed farm program model, focusing on what is certain at this point in time: CSC is planning to open an industrial-scale goat dairy agribusiness. Part One of the report focuses on what we consider, after careful examination, to be the most fundamental foreseeable issues with this plan; our assertions are supported throughout by empirical research. Finding that there are numerous problems with this model, Part Two outlines some alternatives.

PART ONE

The shortcomings of Canada's prison farm model

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We begin this report by detailing the problems we foresee with the proposed goat farm model, focusing on three key realms: issues related to the prisoners, institution-wide problems, and finally, potential community-level impacts. Although there are many potential issues that could be addressed in each of these categories, due to space constraints we restrict our examination here to two key considerations for each.

IMPACTS ON PRISONERS

1. Stated purposes are not in alignment with likely consequences for prisoners

The two main rationales for the farm program that have been provided by the Correctional Service of Canada (CSC) and CORCAN (the unit responsible for federal prison work programs) are: (1) that the program will provide vocational skills, thus enhancing the chances of employment upon release and improving reintegration into the community; and (2) that the farm program will have a rehabilitative/therapeutic impact on participants. Each rationale is evaluated in turn below.

Vocational skills and employment

CORCAN's stated mandate is "to assist offenders in becoming employment ready upon release, which in turn supports CSC's mission. This is done through on-the-job and third-party certified vocational training" (CORCAN, 2018b). Four business lines are referenced across their website – manufacturing, textiles, construction, and services – and in some parts of the website, agriculture has been included as a fifth (e.g., https://www.csc-scc.gc.ca/corcan/002005-0007-en.shtml). To date, it is unclear whether or not there will be third-party certification in the agriculture line. The Minister of Public Safety and Emergency Preparedness, Ralph Goodale, explicitly stated in his Commissioner's Mandate letter to Anne Kelly upon her appointment as Commissioner of CSC in 2018, that "vocational programming should be focused on skills development linked to employability" (CSC, 2018a), which would be augmented by certification. Canada's Correctional Investigator, Dr. Ivan Zinger, has highlighted the need for prison work programs to be designed to match the needs of the labour market, recommending specifically training in skilled trades and Red Seal certification (Burke, 2017). CSC has not indicated that prisoners employed in the prison

dairy operations will receive certification of some sort, and given the nature of the industry, it seems unlikely. Moreover, as discussed below, the prison farm program will not "match the needs of the labour market," as recommended by Dr. Zinger.

CORCAN's own research (Nolan et al., 2014) indicates that working while incarcerated does not necessarily translate into reduced risk of recidivism. Controlling for risk factors, they did find that prisoners who participated in a CORCAN program were more likely to gain employment upon release than those who had not participated in a CORCAN program; notably, however, it was participating in the Community Employment Centre and obtaining vocational certification that significantly enhanced the likelihood of obtaining employment (those who attained vocational certification had 1.54 times greater success securing a job post-incarceration). They did not, however, find a relationship between CORCAN work program participation and duration of employment post-release or between CORCAN participation and reduced recidivism.

The evidence regarding the relationship between prison labour programs and recidivism in other populations has been mixed. In a recent review of the literature, Duwe (2015) provides the following apt summary:

> The overall evidence from the program evaluations is not overwhelmingly positive. Nevertheless, there are several considerations that work against drawing the conclusion that employment programming cannot lower offender recidivism. First, research suggests that individuals are *less likely to commit crime when they work more often and have employment that is stable, is considered satisfying, and is perceived as having career potential.* (Duwe, 2015, p. 562; emphasis added)[4]

There is empirical evidence to suggest that employment in the livestock industry does not satisfy these criteria.

The government's own rationale for closing the livestock farm program a decade ago was that it was losing money, it was not teaching prisoners marketable skills, and less than 1% of prisoners secured work in the agriculture industry upon release (cited in Goodman and Dawe, 2016). The number of people the dairy industry employs – which is presumably the industry expected to be the post-release employment destination of prisoners who participate in the goat dairy program – is relatively low. According to the federal government, the dairy industry (dominated by cattle dairy) employed approximately 42,000 people nationally in 2018-2019, 18,805 of whom were employed directly in dairy farm operations (Canadian Dairy Information Centre, 2020). These statistics do not reflect the fact that a portion of those employed on dairy farms have an ownership interest in the farm (often family), thus leaving fewer jobs available for the general public. The numbers from Ontario are instructive: In a survey conducted by the Ontario Ministry of Agriculture, Food, and Rural Affairs (2010), the average reported number of people employed on dairy farms was 5.8 people. Of those people, on average, 2.2 had an ownership interest (e.g., spouses, children) and one other family member was employed on the farm without ownership interest, which leaves only 2.6 "arm's length" employees.

[4] It should be noted that a generally stronger relationship between *educational* programming and reduced recidivism has been documented (Wilson et al., 2000). A recent meta-analysis of nearly 40 years of research found that those who participated in an education program were 28% less likely to recidivate than those who did not engage in such programming (Bozick et al., 2018).

While there is a projected growing need for agricultural workers in some sectors, the dairy industry is not one of them. A report by The Canadian Agricultural Human Resource Council (n.d.) forecasting the conditions in the agricultural labour market to 2025 identifies a labour gap between how many agricultural workers are needed versus how many are employed in the industry. Broken down by commodity, the largest gap currently (and the gap expected to be the largest by 2025) is in the "Greenhouse, nursery, and floriculture" segment; "Other crops" and "Grain and oilseed" round out the top three. Dairy is near the bottom of the list and is projected to have a smaller labour gap than it currently does (approximately half) by 2025. Accordingly, it is stated in the report that "the 'poultry and egg' industry and the 'dairy' industry account for a small share of the gap and are expected to have the most balanced labour markets over the forecast period" (p. 5). Thus, not only is the number of jobs available in the dairy industry currently not plentiful, availability is not expected to expand. Furthermore, as will be elaborated upon later in this report, there is evidence indicating that although the goat dairy industry more specifically enjoyed some expansion in recent years, the growth curve appears to have flattened (see Smith, 2018).

To recap: It is unclear if prisoners participating in the farm program will receive certification that would make them more competitive in the job market upon release, although it is seemingly unlikely, and employment prospects in the dairy industry do not appear particularly promising.

There is one last factor worth considering in this section on vocational skills and employability. If prisoners are indeed able to secure jobs upon release, what will employment in the industry be like for them? Occupational health and safety warrant some consideration. The agriculture sector in general has high injury rates compared to occupations in other sectors. For instance, data from Ontario's Workplace Safety and Insurance Board place it as the sector with the second highest injury rate (second only to transportation) (WSIB Ontario, 2020). More specific to the dairy industry, the conditions documented in empirical research were concisely summarized in an article in the journal *Public Health* as follows:

> The demands of the dairy industry on worker health are many. On a daily basis, dairy workers are faced with diverse challenges, including high workload and time pressures, equipment failures and technological difficulties, and hazardous working conditions. As a result, the dairy industry has long been recognized as a high-risk occupation, characterized by elevated rates of injury, illness, and turnover. In fact, it is one of the few industries that experienced an increase in non-fatal injuries between 2010 and 2011. Some of the more common occupational hazards include risks associated with machinery operation and repair, large animal handling, respiratory exposures, ergonomic risks including repetitive motions and high muscle forces required in parlor milking, and fatigue due to long hours and physical demands. (Menger, Pezzutti, Tellechea, Stallones, Rosecrance, and Roman-Muniz, 2016)

The impacts are not only physical – they can also extend to mental health. As the Ontario Ministry of Agriculture, Food, and Rural Affairs states in their Mental Health for Farmers section of their website, "stress is inevitable, especially if you work in an often volatile and unpredictable industry, such as agriculture" (OMAFRA, 2016b).

Literature specific to Canadian goat dairies is sparse, but there is no reason to think that worker experiences would be significantly different, except that the animals they are handling are smaller, so the potential severity of injuries due to physical animal handling might be attenuated.

Yet, as one former prisoner who worked in one of the old prison farms (with cows), and who has been consulted in relation to the new program, pointed out:

> A cow is an intimidating animal because of its size and its nature. It's an intimidating animal. A little goat, cute little cuddly goat, is not a very intimidating animal. So right there you're opening the door for guys that are having a bad day and they're going to lash out at these animals. If you lash out at a cow you're taking your life into your own hands. If you lash out at a goat, there's no fear factor to keep you from smashing a goat, where there was with a cow. (Interview with Evolve Our Prison Farms, 2019)

The risk of illness in livestock operations is also relevant here and is detailed in the Institution-level section of this report because those risks can extend beyond individual prisoners to the larger institution.

Rehabilitative and therapeutic effects

The second rationale given for the prison farm program is that it will have rehabilitative and therapeutic impacts. Of note, in the Commissioner's Mandate Letter to Commissioner Kelly (2018), Minister Goodale commends the progress that has been made in "reintroducing prison farms as a therapeutic and rehabilitative tool." He goes on to state: "For all offenders, it is critical to continually ensure that CSC's rehabilitative programming is demonstrably effective, with both internal and external analysis and research to back it up. I encourage you to partner with and support community organizations and volunteers in order to provide a greater variety of programming alternatives, such as programs related to the arts, programs involving animals, and programs that include peer mentoring."

There is research that has documented positive impacts of animal assisted therapy and programs where prisoners train animals, specifically vis-à-vis fostering empathy (e.g., Britton and Button, 2005; Furst, 2006; Furst, 2007; Harkrader et al., 2004; Wells, 2009). There is not, however, empirical evidence pointing to rehabilitative and therapeutic benefits of interactions with animals in an industrial livestock operation context. Using animals for therapeutic purposes in an institutional context is not as simple as adding animals and stirring: the ways in which they are integrated is important. Anyone who has been in an industrial livestock operation would be well aware that meaningful engagement with individual animals is impractical, and indeed, not encouraged. To illustrate the point, whereas animals in training programs or therapeutic programs are named, animals in industrial livestock operations are intentionally not named, and instead are numbered. Industrialized animal agriculture requires this objectification, distancing, and the associated efficiencies (see Fitzgerald, 2015, for a review).

There is, however, evidence that work inside intensive livestock operations can have deleterious effects on some people – above and beyond the relatively high injury and illness rates. In her book on perpetration-induced traumatic stress, which details the negative psychological consequences of participating in socially-approved violence (e.g., in the context of war, law enforcement), MacNair (2002) raises the possibility that those whose employment involves harming animals may also suffer psychological consequences. To date there has been relatively little research conducted to investigate this possibility. Of note, one study found that, compared to a control group, butchers (n=82) were significantly more likely to report experiencing somatization, obsessive-compulsiveness, depression, anxiety, anger-hostility, paranoid ideation, and psychoticism (Emhan

et al., 2012). While it is theoretically possible that this line of work could attract those predisposed to these maladies, according to the literature seeking employment in the industry is driven by financial need and other practical motivation more so than a desire to work with dying and dead animals.

These considerations have added relevance given that CSC owns an abattoir located on the grounds of Joyceville Institution, leased to Wallace Beef Inc., where prisoners perform slaughter work as an "industry training program" (CSC statement to the Standing Senate Committee on Human Rights, n.d.). Certain prisoners who have worked in the abattoir have detailed "dangerous and denigrating working conditions, as well as trauma related to inflicting or witnessing violence against animals" (Struthers Montford, 2019).

Other studies have pointed to potential negative community impacts of the animal slaughtering/processing sector of the industry, including documented increased crime rates where large operations are sited (Broadway, 2000; Fitzgerald et al., 2009; Artz et al., 2007). This pattern runs counter to that observed for other industries (Fitzgerald et al., 2009). Although these studies are unable to draw conclusions about causation, they provide evidence of a negative relationship between this type of work and community well-being, even when statistically controlling for predictors of crime rates (e.g., number of young men, measures of social disorganization, unemployment).

Speaking specifically about prison farms, Struthers Montford argues "prison farms represent a specific apparatus of settler colonial territorialisation that expands the footprint of the prison, naturalizes private property relationships to land and to animals" (Struthers Montford, 2019). Interactions with animals that are commodified and objectified are likely not conducive to facilitating empathy and rehabilitation, and if rehabilitation is indeed a goal of the prison farm program, it warrants serious reconsideration (see Fitzgerald, 2012).

Proponents of prison farms will no doubt respond with anecdotal stories of prisoners speaking positively of having worked with livestock animals in prisons, which can readily be countered by anecdotal stories of the reverse: prisoners being traumatized by the work and all that it entails. For instance, one prisoner who worked on a Canadian prison farm in the 1990s reported the following:

> When I had to go in and take a baby calf away from her mother, I was putting my life at risk, because them cows were wanting to kill me when I would go in and try to take the calf. They knew what we were doing, and they were going to do whatever was in their power to stop that. So I mean that affected me. Of course it affected me. It was like, whoa man, what am I doing here? They would cry, the mother and the baby would be talking to each other, and it's – oh my God. And you know that hurt, that affected me. (Interview with Evolve Our Prison Farms, 2020)

This same prisoner reported that some of the cows were abused and chickens went missing.

In sum, positive anecdotes must be evaluated against the backdrop of actual empirical evidence of serious challenges for workers within the industry and claims of the rehabilitative impacts of working in intensive livestock operations need to be supported with empirical research. It is also possible that CSC's proposed goat dairy farm program could infringe upon participants' human rights, discussed next.

2. The prison farm plan could contravene prisoners' human rights

Under the previous prison farm model, prisoners consumed what was produced by the prison farm. Due to the Food Service Modernization Initiative, prisoners now cannot consume the produced food. This altered context is important because now food products produced inside prisons need to be donated or sold. It has been reported by various sources, including by Members of Parliament, that CSC's plan is to sell the goat milk on the private market, with some speculating that it will be sold to Canada Royal Milk, established by Feihe International Inc. (Wright Allen, 2020; Allen, 2019), a Chinese infant formula company which has built a major processing facility in Kingston, Ontario.

Regardless of what company ultimately purchases the product, using prison labour to create a product that is sold privately is a shift in CORCAN policy, as evidenced by the following statement by CORCAN on their website: "CORCAN has traditionally marketed itself to federal departments. Departments such as CSC, the Department of National Defence, and Public Works and Government Services Canada had traditionally bought the bulk of CORCAN's products. In recent years, CORCAN has moved to a more diversified product line and begun to market its products and services to a greater number of departments. Also, CORCAN has begun to explore new markets in a more systematic way than before. This has been accomplished with the help of an increasing number of private-sector partners" (CORCAN, 2013).

The use of prisoner labour to produce products that are sold in the private marketplace raises two main concerns: it raises human rights issues and free market considerations. Regarding the former, Canada has taken a strong position on the international stage against the import of products made with prison labour: under Tariff item 9897.00.00 of the *Customs Tariff,* "The Governor in Council may, on the recommendation of the Minister, make regulations (m) for the purposes of tariff item No. 9897.00.00 (i) amending that tariff item to exclude goods manufactured or produced wholly or in part by prison labour from that tariff item." Exceptions can be made for items intended for personal use and not for sale (see Canada Border Services Agency, Memorandum D9-1-6, 2012).

A review conducted by Queen's University's Business Law Clinic (2020) concluded that in contrast, Canada does not have laws in place specifically prohibiting the export or domestic sale of goods produced through prison labour. The analysts point to the United Nations' International Labour Organization (ILO) as providing the most guidance regarding using prison labour to produce products for private sale. The ILO devised guidelines that countries and businesses can use to determine what constitutes forced labour, and more specifically, provide criteria that can be used to determine specifically if prison labour is forced labour. According to their criteria, in order not to be forced labour: (1) the work has to be voluntary (i.e., there cannot be a penalty for not participating); (2) the wages, security, benefits, occupational safety and health have to be comparable to those provided to employees outside of prison walls, although deductions for food and lodging can be made; (3) the prisoners are supervised by prison staff; (4) they are not hired by private companies; and (5) they must have been convicted of an offence (i.e., they are not awaiting trial) (International Labour Organization, 2015).

As far as we are aware, and if the practices of the new farm program are consistent with those of the old program, criteria #3-5 will be satisfied; that is, only those who have been convicted will be eligible to participate, they will be employed by CORCAN and not a private company, and they

will be supervised by prison staff. The voluntariness of prison labour (criterion #1) has certainly been debated. Critics have pointed out that these workers are not free to walk off job sites and search for other employment, failure to participate in a work program could negatively impact parole decisions, and the wages from work programs may be necessary in order to purchase items at the canteen (e.g., Cao, 2019).

The most significant issue that we foresee is with criterion #2: that the wages, security, benefits, occupational safety and health are comparable to that of free labourers. Internal documents obtained through Access to Information request indicate that the annual cost of (non-prisoner) staff and salaries for the prison farm program is expected to be $832,000 (Cumming, 2020a). For federal prisoners, pay ranges from $5.25-$6.90 per day (CSC, 2016). As it does not even come close to minimum wage, clearly this wage is not comparable with what a free labourer would earn outside of a prison environment.

The workaround on this has been that prisoners in Canada have not been legally treated as employees; however, this has been challenged now on a few occasions. The denial of employment status, and therefore the right to unionize and receive minimum wage, has been based on the rationale that prison work programs are engaged in rehabilitation more so than work (Jolivet v. Treasury Board [Correctional Service of Canada]; Guérin v. Canada [Attorney General]; Cumming, 2020b).

Analysis by Toronto lawyer Asaf Rashid (2018) points to some weaknesses that could be addressed in future litigation. He explains that in the *Jolivet* case, the Board looked to a precedent of prisoners being allowed to unionize and determined that *Jolivet* did not meet that threshold. The case heralds back to the 1970s and involved prisoners being employed in a slaughterhouse. The Ontario Labour Relations Board ruled that prisoners were employees in this case and could unionize with the free labourers who worked in the slaughterhouse. In the decision in the Jolivet case, the Board stated:

> For some purposes and in some circumstances, offenders in correctional institutions who participate in work programs could be found to be employees. Evidence of the nature and purpose of the work, the working conditions, and the work's integration into the employer's operations, among other factors, would be critical to such a determination. (Jolivet v. Treasury Board [Correctional Service of Canada])

Although the Board did not think the characteristics of the specific prisoner work in the Jolivet case warranted consideration as employment, Rashid suggests that if additional evidence had been presented the decision may have been different. Furthermore, he argues that demonstrating the vulnerability of prisoner workers could be decisive and that the precedent cases do not determine that employment and rehabilitation are mutually exclusive; instead "they state that the overall purpose of the program must be assessed and that an employment relationship may still be found if there are enough indicators of such a relationship despite the rehabilitative aspects." He concludes that prisoner workers "cannot continue to be left wandering in the unconstitutional territory in which s. 2(d) of the Charter is entirely unavailable. The exclusion is even more problematic if the employees are vulnerable and in greater need of protective measures, as is the case."

It is our contention that, in a case of prisoners working in an intensive livestock operation where the products are sold to private companies, a determination may indeed be different, particularly if the case can be made that it does not serve a rehabilitative function.

In addition to being paid dramatically disparate wages than free workers, as noted earlier, there are occupational health and safety challenges in intensive dairies. For the purposes of determining if there are human rights issues at play with the involvement of prisoners in this work, one might also consider whether the occupational health and safety inside the prison is comparable with employment in the industry outside of the prison. Working in intensive livestock operations brings with it a risk of zoonotic diseases (i.e., those that can cross species lines) and other illnesses, notably respiratory. The communicability and consequences of some of these illnesses can be worsened by communal living arrangements, such as prisons – a point that is elaborated upon in the next section addressing institution-wide considerations.

In sum, prison farm labour is not comparable to that outside of the prison: the wages and health and safety considerations are markedly different from those in the industry outside of prison walls. Yet the products from the prison farms will be sold in the private market, which also could constitute unfair market practice to use those employed below minimum wage to produce products (a point elaborated upon later in this report). For these reasons, and those delineated below, the new prison farm model is sure to invite legal challenges from a variety of constituencies. Yet, the fear of violating human rights laws and standards is not the only – or even the best – reason for taking the human rights and well-being of prisoners seriously. As the Correctional Investigator of Canada has pointed out, "the best argument for observing human rights standards is not merely that they are required by international or domestic law but that they actually work better than any known alternative – for offenders, for correctional staff, and for society at large… Treating prisoners with humanity actually enhances public safety" (Zinger, 2006).

IMPACTS ON THE INSTITUTION AND CSC

There are a number of institutional-level factors that must be taken into consideration because the impact of the farm programs will extend beyond the individual prisoners who participate in them to the rest of the incarcerated population, corrections staff, others working within the institution, and CSC as a whole. In this section we address what we consider to be the two most significant factors.

1. Risk of illness

The two key risks of illness that we foresee in an operation of this type are viral and those resulting from diminished air quality. Regarding the former, the COVID-19 pandemic[5] has drawn the public's attention to a risk that is inherent to intensive livestock operations: zoonotic illnesses. Academics have been sounding the alarm for years; for instance, in 2015 Fitzgerald wrote "There

[5] It is worth noting the existing vulnerability of incarcerated populations to COVID-19 transmission, even without the increased risks associated with the prison farms. In December 2020, a COVID outbreak was declared at Joyceville Institution, with 160 inmates testing positive to date (CSC Inmate testing and case summary, retrieved January 26, 2021: https://www.csc-scc.gc.ca/001/006/001006-1014-en.shtml).

is growing concern about these zoonotic (meaning that they can cross species lines) [virus] strains and speculation that the next human pandemic will originate in animals and breach the species line with deadly consequences" (p. 98).

In brief, the problem is that large concentrations of animals, kept in close contact and under stress, breed viruses. They can mutate and spread to other organisms inside intensive livestock operations, such as insects, rodents, and people (Schmidt, 2009; Gilchrist et al., 2007; Saenz et al., 2006; Stathopoulos, 2010). While the COVID-19 virus is believed to have emerged in a wet market, the viruses that came to be known as the bird flu and swine flu originated in intensive livestock operations (Stathopoulos, 2010; Mason and Finelli, 2005; Schmidt, 2009).

Goats have also been identified as being responsible for the transmission of zoonotic illnesses. Of note, researchers in the Netherlands are currently hypothesizing that a zoonotic illness originating on goat farms is responsible for a 20-55% greater risk of developing pneumonia among those within a 1.5km radius of a goat farm (Kevany, 2021).

Not only can these locations be sites of zoonotic virus emergence, they are also ripe for transmission between people. Studies documented increased risk among workers in intensive animal agriculture operations of contracting the swine flu. One study compared farm workers with a control group and found that farm workers were 50 times more likely to have the antibodies and their spouses were 25 times more likely (Schmidt, 2009). The increased rates among the workers' spouses points to the fact that these workers are not the only ones at greater risk: those they cohabitate with are as well.

But the risk does not stop there. A group of researchers modeled the risk of viral transmission and concluded "the presence of CAFO [Concentrated Animal Feeding Operation] workers increases dramatically the size of the epidemic and that these effects are greater as the percentage of CAFO workers [in a community] increases" (Saenz, Hethcote, and Gray, 2006, 341). Specifically, if 15% of a community is comprised of those who work in intensive livestock operations, the estimated proportion of those infected is 42%; the proportion expected to be infected increases to 86% when these workers make up 45% of the population (Saenz et al., 2006).

The Centers for Disease Control and Prevention (2020) identified risk factors that have contributed to swift COVID-19 transmission in the meat and poultry processing industry, even though it did not emerge there, including working close together on animals, having prolonged exposure to fellow workers, many shared spaces and surfaces, sharing transportation, and having frequent contact with co-workers outside of work (e.g., communal living). Although the concentration of people in dairy production facilities is not as high as in meat processing facilities, having a dairy facility within a prison would bring into convergence two populations that have been identified as particularly vulnerable – those in prisons and those employed in animal agriculture.

In the age of COVID, it is even more prudent to consider the spread of pandemic viruses and viruses more generally within workplaces, and to reflect upon Minister Goodale's urging, in his Commissioner Mandate Letter to the new CSC Commissioner in 2018, to make "progress toward lower rates of infectious diseases" in CSC facilities. Minister Goodale's words are even more pressing now.

The risk of illness is not limited to viruses. There are other risks (e.g., bacterial, such as Q fever, transmissible from cattle, goats, and sheep, and causes pneumonitis [Linaker and Smedley, 2002]), but due to space constraints we cannot cover all non-viral risks here. Instead we will address a key risk that is specifically related to compromised air quality in intensive livestock operations, primarily due to dust and bioaerosols (see, for instance, Donhamn et al., 2007). Empirical studies have demonstrated that dairy workers are at greater risk of several illnesses than the general population, including chronic bronchitis, wheezing, allergies, pneumonitis, organic dust toxic syndrome, and acute airway obstruction (Eastman et al., 2013).

These airborne risks, of course, do not stop at the property lines of these facilities. There is a sizable and growing body of literature documenting increased incidences of respiratory symptoms in communities surrounding intensive livestock operations (see Thu et al., 1997). Moreover, studies have even documented higher rates of mood disorders and sleep disturbances among those who live in proximity to intensive livestock operations, believed to be related to malodourous compound exposure (Schiffman et al., 2000). There is therefore reason to question not only whether or not the planned prison farm would put those working within it at risk, but also whether it could put on-site correctional staff, other prisoners and individuals within the prisons, and the broader community at risk as well.

2. Abundance of uncertainties and unanswered questions

There are a number of uncertainties regarding how the prison farm programs will operate and how CSC will cope with exogenous factors that will introduce additional uncertainties. One such potential issue, which has been unmasked by the COVID-19 pandemic, is the vulnerabilities in the dairy market. As restaurants and schools were closed due to the pandemic, demand for dairy through these bulk purchasers dropped. When demand drops, however, dairy production cannot be quickly corrected for. As one CBC article put it: “as demand fluctuates, cows keep producing milk daily” (Sagan, 2020). So do goats. An unknown amount of milk was dumped because producers could not store it and did not have a market to sell it to. Has CSC thought through these potential market disruptions? We have not seen evidence that they have. The public still does not even know how and where they plan to sell the goat milk that the farms will produce, which was articulated in a recent article in *Ontario Farmer* as follows: “The major worry currently is that no one knows where and when they will be able to sell goat milk if the facility gets built and operating” (Cumming, 2020a).

There are also potential vulnerabilities in the workforce. As noted above, the production of milk by these animals cannot be quickly adjusted. What if there are disruptions in the supply of prison labourers? For instance, what if there is a shortage of workers due to a lack of interest in this type of work? Or what if there are not enough interested prisoners who are considered low enough risk to participate? Or what if there is a prison lockdown and none of the workers are able to be there to milk the goats? The goats will need to be milked twice a day regardless.

Another uncertainty that any goat herd in the country has to deal with is the potential of scrapie (a contagious spongiform encephalopathy that affects goats and sheep). According to the Canadian National Goat Federation, “the continued presence of scrapie in Canada is preventing access to international markets including the United States” (2019a). The symptoms are varied, but can

include aggression, tremors, lack of coordination, and weakness. Identification of a case on a farm requires "humane destruction and disposal of all infected and at-risk animals" (Canadian Food Inspection Agency, 2019). Because genotyping is not a reliable method for detecting susceptibility to scrapie in goats, "all goats are ordered destroyed" (Canadian Food Inspection Agency, 2019).[6] Has CSC thought through the possibility that there could be a scrapie outbreak in their goat herd? What could the impact of having to "destroy" all of the goats in the herd be on participating prisoners and staff?

Moreover, there are two by-products of milk production that must be dealt with. The first is manure. Simply put, animals produce a large amount of manure. A study of goat manure production estimates that adult goats excrete 5.3% of their body weight in manure per day (Ogejo et al., 2010). In Canada, the most commonly used breeds for milk are Alpine, Lamancha, Nubian, Oberhasli, Saanen, and Toggenburg (Canadian National Goat Federation, 2019b). Average adult female weights are 135lb/61kg, 130lb/59kg, 135lb/61kg, 120lb/54kg, 135lb/61kg, and 120lb/54kg, respectively (American Dairy Goat Association, 2020). We can expect then that each goat will produce between 6lbs/2.72kg and 6.75lbs/3.06kg of manure per day. As noted earlier, the likely conservative estimate of the number of goats that will be milked is 2000. This would amount to the production of between 12,000lbs/5,440kgs and 13,500lbs/6,120kgs of manure per day.

Manure is not just a nuisance; it can be dangerous. It can contain a variety of harmful substances, including ammonia, methane, hydrogen sulfide, carbon monoxide, cyanide, phosphorous, nitrates, disinfectants, heavy metals, remnants of drugs given to the animals, and studies have documented the presence of more than one hundred types of pathogens (Hahn Niman, 2009; Tietz, 2010; Stathopoulos, 2010).

According to the Nutrient Management Strategy CSC commissioned, the plan is to erect two large barns and a concrete manure lagoon 14 feet deep and 120 feet in diameter to store manure, while additional manure will be spread on land. These are the two main methods used in the industry to deal with the immense amount of manure produced; each comes with associated problems. The vapors from lagoons pose a risk to workers, and indeed there have been documented deaths (Tietz, 2010). Also, rain can cause flooding of lagoons. As such, Tietz observes that floods in counties with high concentration of pig production "have transformed entire counties into pig-shit bayous" (2010, p. 111). The other commonly used option is to spread the manure on adjacent land. However, whereas human sewage is treated for disposal, animal manure applied to land is not treated because doing so would be too expensive by industry standards (Hahn Niman, 2009; Tietz, 2010). The expected amount of manure would require a sizable amount of land for disposal, and the Nutrient Management Strategy contains a suggestion "to approach at least one of the neighbouring cash crop farmers to 'secure' additional land base for the potential utilization for surplus A. S. M. [Agricultural Source Material] application for future use by Correctional Service Canada, especially once the full livestock volume is realized in the fourth and fifth year of establishing the Dairy Cattle and Dairy Goat herds" (p. 12). If the amount of manure spread on the land exceeds what can be handled naturally, the risk of contamination, by both bacteria and excessive nutrients, increases.

[6] A list of scrapie-infected herds by province can be found at: https://www.inspection.gc.ca/animal-health/terrestrial-animals/diseases/reportable/scrapie/herds-infected/eng/1562600483485/1562600483734

Manure can seep into surface water through lagoon breaches or runoff from manure-treated land. It can spread bacteria and cause eutrophication of bodies of water due to high nitrogen and phosphorous levels (West et al., 2011; Centner, 2006). A number of studies have documented water quality problems around intensive livestock operations. In one such study examining water samples around these operations weekly, 98% had *Escherichia coli O157:H7E* (*E. coli*) levels that exceeded water quality standards (Zande, 2009). Moreover, a comparative study of intensive livestock operations and wastewater treatment plants found that the wastewater downstream of the treatment plants was significantly better than that near the livestock operations. All livestock sites tested exceeded acceptable phosphorous levels, and approximately 42% contained bacteria resistant to multiple antibiotics, compared to approximately 17% of the other sites examined (West et al., 2011).

This is not an abstract concern. A concrete case that occurred only four hours west of the proposed prison farm sites is instructive. Twenty years ago, Walkteron, Ontario was home to one of the world's worst outbreaks of *E.coli* 0157:H7, and Canada's worst municipal water disaster. Seven people died from consuming the water and 2300 others fell ill. Several studies and a public inquiry afterward pointed to a cascade of problems that resulted in the massive municipal water failure, but the original source of the problem was traced to "heavy rainfall (134 mm) [that] resulted in surface runoff containing *E. coli O157* and *Campylobacter jejuni* entering a well supplying drinking water. The bacteria came from manure that had been spread on a nearby farm (using accepted best management practices)" (Salvadori, Sontrop, Gard, Moist, Suri, and Clark, 2009, p. 533).

An environmental assessment at Joyceville Institution (cited in a 2018 environmental effects evaluation of demolishing the old cattle barn, conducted by A & A Environmental Consultants) found an "area of potential environmental concern" related to a manure lagoon that was used for the former livestock farm at the site. Testing of three monitoring wells in 2010 found "elevated concentrations of *Escherichia Coli* and Total Coliforms that exceeded both Health Canada's '*Guidelines for Canadian Drinking Water Quality, December, 2010*' and the province of Ontario's '*Ontario Drinking Water Quality Standards, 2006*' in all of the wells" (A & A Environmental Consultants, 2018). Subsequent sampling also found "*Escherichia Coli,* Total Coliforms and nitrate concentrations were measured above the applicable standards" (A & A Environmental Consultants, 2018). According to A & A Environmental Consultants, that earlier report recommended conducting a survey to see if well users within a minimum one-kilometre radius of the old manure lagoon were using that aquifer as a source of water for human consumption. Through our requests for Access to Information we have only been granted access to the 2018 report by A & A Environmental Consultants regarding demolishing the old cattle barn, and we are therefore unclear what the findings of that survey were and what the status of that "area of potential environmental concern" currently is.

We are left wondering: What risks might be posed to the health of those within and outside of the institutions? And what risks might be posed to wildlife in the area? A & A's environmental report identified several species at risk at the Joyceville site, including Eastern Milk Snake and Grasshopper Sparrow.

The second by-product of milk production that must be taken into consideration, and that to date CSC has not publicly disclosed, is what will happen to the male and excess female goats that result from the process of continually impregnating goats so that they continue to produce milk? According to Ontario Goat (n.d.), goats used for dairy production are mated between 7 and 9 months of age so they are producing milk at approximately one year. They are generally bred once a year thereafter. Kids are removed shortly after birth from their mothers and raised on milk replacer so that the goats' milk production can be diverted for human consumption.

Although dairy production is often perceived as less lethal and therefore less harmful than using animals for meat production, the male animals and excess female goats that are produced in the breeding process are generally killed. "Spent" goats (i.e., those that are no longer producing significant volumes of milk) are also killed. It is unclear what CSC's plan is for these excess animals. Will they be sent to slaughter as kids? Will kids be sold to other parties? Will the kids be kept until they reach market weight and then slaughtered? Presumably prisoners will be involved in separating the kids from their mothers. Will they also be responsible for dispatching them?

In addition, most goats have horns and are generally disbudded/dehorned (to reduce the risk to workers) when young (at approximately one week of age); dehorning later becomes more dangerous. The most common method of disbudding used in Canada is to use a hot iron. The acknowledged disadvantages of doing so include that "it requires training to apply correctly and consistently, [and] potential to overheat the brain and cause damage and death" (Ontario Goat, 2020). Producers are not required to give goats medication to manage pain during this procedure, and Ontario Goat reports that only approximately two-thirds of veterinarians and one-third of producers report providing goats with analgesics for the procedure. They also report that the goats (understandably) scream out (i.e., bleat) when held down and having their heads burned, and that "it is this loud, intense bleating that, for many, makes the process of disbudding a dreaded task" (Ontario Goat, 2020). Will prisoners be expected to do this work? Will CSC be willing to pay for analgesic for the procedures?

IMPACTS ON THE BROADER COMMUNITY

The issues posed by the proposed farm program are not restricted to prisoners and the institutions where farms will be opened – the impacts could potentially extend beyond prison walls. Some of these potential issues have already been discussed, including impacts on water and air quality. There are two potential impacts that have not yet been addressed that warrant attention here. The first issue – decreased property values – is specific to the proximate region around the prisons, whereas the second issue we would like to raise here – the potential of unfair competition with private industry – extends more widely.

1. Reduced property values

In addition to the potential air and water quality issues that can arise in communities surrounding intensive livestock operations, there are other factors, such as noise and odour, that combined can negatively impact property values in surrounding areas. Decreased property values around intensive livestock operations have been quantified by studies in the United States, where the

impacts have varied by state. In Washington and Michigan, the estimated value loss of properties close to intensive livestock operations is 50% (Kilpatrick, 2001); the estimated total country-wide loss is $26 billion USD (Imhoff, 2010).

Summarizing the empirical findings in the literature in a recent issue of *The Appraisal Journal*, Kilpatrick explains:

> The establishment of an AO [animal operation] results in value diminution to nearby properties, both through a negative externality as well as through indirect economic impacts. The amount of the value loss is an inverse function of distance (closer properties diminish more), a function of property type (newer, nicer residences lose more), and a function of property use (farms will lose value due to diminished productivity)… The empirical studies and case studies results indicate diminished marketability, loss of use and enjoyment, and loss of exclusivity that can range up to nearly 90% of otherwise unimpaired value for homes that are adjacent to the facility. Negative impacts are noted at distances exceeding 3 miles, and in the case of a flood or other weather event, waste from the facility can be spread over far greater areas, extending the area of negative impact. (Kilpatrick, 2015, p. 47)

Unfortunately, the literature also indicates that attempts to mitigate the negative impacts of livestock operations do "not appear to have an economically material impact on nearby property values" (Kilpatrick, 2015).

Some of the research has focused specifically on dairy operations. In a study conducted in Ohio and published in the *Journal of Dairy Science*, residents living within 1.6km of a large dairy operation were surveyed one year after it had opened. Among the findings reported, 25% of the 64 participants reported they planned to sell their home in the next five years, 81% reported disconcerting manure smell, 69% reported perceived diminished water quality, and 83% believed dairy operations decrease property values (Schmalzried and Fallon, 2007).

Although we have been unable to locate similar studies conducted in Canada, nor studies that specifically examine the community impacts of prison farms, the broader body of research indicates that there are many reasons to be concerned about potential community impacts.

2. Competition with private industry

The last specific issue we would like to raise has to do with a prison industry competing with private entities. It is unclear that there is a need for another large-scale goat dairy operation. A 2006 report on the Canadian goat dairy industry produced by Agriculture and Agri-Food Canada did not paint a positive picture of the market and warned of shifts in the industry:

> The Canadian dairy goat industry experienced rapid growth and expansion in the late 1990s and early 2000s especially in Ontario and Quebec. During this time, it appeared that demand was outpacing domestic supply. More recently, however, the industry's growth seems to have slowed with demand exhibiting some softness. At the same time, imports as well as production growth have fallen. The unavailability of marketing resources and the lack of official data are impeding industry members' ability to produce strategic business and production plans. High producer/processor turnover rates, inexperience and seasonal supply/demand issues are also challenges facing the industry. (AAFC, 2006, p. 10)

A more recent article in *Real Agriculture* (Smith, 2018) titled "Goat dairy industry facing oversupply, uncertainty with processors," reports that within the recent past there has been an influx of people getting into the goat dairy business (some moving out of the cow dairy business). And a new "mega-factory" being built in Kingston by Feihe International, a Chinese company that produces baby formula, "promised a near doubling in demand for eastern Canada's goat milk. But, as with any free market, good times equate to more production, and now – similar to cow's milk – the world is awash in supply." The president of Ontario Goat was quoted in the article as saying that supply in the industry has increased and demand has declined. According to Ontario Goat's (n.d.) data, the number of goats in Ontario increased by 52.75% between 2006 and 2011. The president of Ontario Goat also rightfully pointed out in the interview that all of this does not mean that the industry is doomed, but it is an inherent risk of doing business in an open market. This kind of volatility might make one question the prudence of investing millions of dollars of taxpayer money in a goat dairy venture.

Regardless of whether or not there is currently enough demand to warrant a new goat dairy operation, or whether there might be in the near future, by entering into the market, the Canadian Government, through CORCAN and CSC, would be taking that share of the market away from a private producer. This could open it up to accusations of unfair competition, given that it would be federally subsidized and that the incarcerated workers will be paid less than $1 per hour, minus 30% for room and board.

In a review of the argument that prison labour programs that sell items on the open market are engaged in unfair competition, economist Frederic Pryor (2005) undertakes an analysis of aggregated industries and demonstrates that the Federal Prison Industries in the United States has taken a small share of sales in any one sector. He states, however, that the impact on "very particular markets" (p. 3) could be significant. He also concludes that the wages paid to prisoners are a fraction of outside wages so that "these prison industries have a certain competitive advantage" (p. 10). Other advantages enjoyed by prison industries include that their workplace health and safety might not be regulated the same way and they may not incur the same production costs that private businesses do (e.g., rent). He concludes:

> In certain ways these complaints of private enterprises against the prison industries have merit. While it is difficult to predict how court rulings about unfair competition might turn out in the future, this means that prison industries might be wise in not aggressively pursuing high market shares of particular products, but rather spreading their production over a number of goods and services, which, in turn, raises many problems and requires entrepreneurial prison officials guiding these programs. (Pryor, 2005, p. 11)

There are only 225 licensed goat dairy farms in the province of Ontario. Further, according to an Ontario Goat (n.d.) fact sheet, "commercial dairy goat farms range in size from 150 goats to over 400 goats. Most farmers that are serious about commercial dairy goat farming are growing their herd to upwards of 400-500 goats, and the largest herd in Ontario has approximately 1,200 goats." Based on these industry statistics and what has been gleaned about CSC's planned farm program, CSC's goat farm would be the largest in the province. This would surely constitute a large share of a relatively small market.

For these reasons, we consider this a risky and unwise venture, and propose instead several alternative programs that would be better for the prisoners, corrections staff, CSC, and the broader community, outlined next.

PART TWO

A framework for transforming Canada's prison farms

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KEY PRINCIPLES

Despite their general popularity among the public, prison farms do not necessarily have beneficial impacts on prisoners, the environment or the broader community. In fact, as we have highlighted in Part One, their impacts can be quite destructive and harmful. However, this does not need to be the case. There are many examples of promising prison farm programs that illustrate the potential for positive impacts on prisoners, the planet, and society as a whole. Speaking of the prison farm program at Cedar Creek Corrections Center, which produces organic vegetables and compost, the Washington Department of Corrections notes: "it reduces cost, reduces our damaging impact on the environment, [and] engages inmates as students" (The Associated Press, 2008).

In this second part of the report, we describe and evaluate different models that offer promising practices for alternative prison farm models that compare favourably against the approach currently planned by the Correctional Service of Canada (CSC). Before directing our attention to specific models, we outline a series of principles or objectives that have guided our evaluation of the models and their implementation. Overall, we have based our analysis and recommendations on available research and evidence to identify promising practices for a renewed prison farms program in Canadian federal prisons.

1. Public, non-profit mandate

The most promising model for a prison farm program is one that is publicly managed, in partnership with relevant external community partners, and focuses on the well-being of prisoners and the wider community. The preference for public management should not be interpreted as an endorsement of previous or current CSC management approaches, but a recognition that the involvement of private entities in the management of public institutions and services (whether through public-private partnerships or contracting-out) rarely ends well. Public management increases the potential for accountability and transparency, an important element for evaluating the progress and impact of the prison farms program. Further, any CSC prison farm program should have as its primary mandate the creation of meaningful training, education and rehabilitation opportunities for prisoners, as opposed to the creation of profit. While some of the

program models outlined in this report will reduce operational costs (food production for food services, reduction in landfill fees), the generation of revenues should not be a primary objective.

The legal and ethical ramifications of prison labour for private enterprises has been well-articulated in Part One. CORCAN has expressed an interest in expanding public-private partnerships as part of its strategic business priorities (CORCAN, 2018a). However, research into public-private partnerships highlights numerous limitations and challenges with the use of these types of partnerships to effectively deliver public services and programs (Gideon and Unterhalter, 2017; Hudon, 2014; Siemiatycki, 2015). While there is ample opportunity to collaborate with non-profit organizations and businesses in programming and employment training, care should be taken to avoid scenarios where private businesses or outside organizations are able to use the labour of prisoners for their own operational objectives and financial benefit. The same caution should be applied to any activities that would see CORCAN financially benefit from the labour of prisoners. As Haffner writes, speaking of the prison garden program at the Rikers Island jail complex in the U.S.:

> There is a fine line between landscape work and landscape therapy. While it's hard to argue that time on Rikers is better spent locked in grim dormitories than in a garden, "getting back to the land" has not been and is not now universally therapeutic. The rhetoric of nature as "healer" … can be used just as effectively to exploit prisoners and former prisoners as it can to enhance their future opportunities. (Haffner, 2018, n.p.)

The public campaigns to save, and then reinstate the prison farm programs frequently cited the soft skills and therapeutic potential of the prison farms. Yet, this was not the core objective of the programs – their primary stated purpose was prisoner employment and training opportunities, as well as the production of food for prisoners. The current plans for the re-opened prison farms will only cement their position as a business stream within CORCAN with a strong profit generation mandate. The prison farm program should be positioned as a social program, which will help to ensure their purpose as a training, education and rehabilitation program remain front and centre, as opposed to an afterthought.

2. Tangible and direct benefit to prisoners

Our correctional system is supposedly based on the principle that the removal of an individual from society (through incarceration) is the punishment, not how they are treated while incarcerated ("prison *as* punishment, not *for* punishment") (Zinger, 2016). Despite this, prisoners and their advocates have made note of numerous issues and problems within prisons. Thus, one of our principle starting points for this analysis is that any prison farm program should provide a tangible and direct benefit to prisoners. We have identified three possible avenues: (1) providing healthy and nourishing food for prisoners, (2) employment that offers fair compensation and decent working conditions, and (3) meaningful training, education and reintegration activities. These areas speak to both types of programming offered by CSC: Rehabilitation and Reintegration programming. Meeting these objectives will, of course, require a rethink of the current prison farm model, a task we address in the subsequent pages of this report.

Prioritize healthy and nourishing food for prisoners

A frequent concern raised by prisoners (as well as the Office of the Correctional Investigator) is the lack of fresh, healthy and nutritious foods served in federal prisons (Chow, 2017; Clancy, 2015; Shook & McInnis, 2017; A'Hern, 2017). A recent study found that 73% of prisoners in federal prisons in Canada gained weight during their incarceration. The authors of that study referred to federal prisons as "obesogenic environments"[7] (Johnson et al., 2018). A'Hern, a federal prisoner in the Atlantic region, summed it up as "we get fatter, while at the same time being malnourished" (A'Hern, 2017, p. 83). One prisoner from Collins Bay specifically connects the poor quality of food with the emphasis on processed and packaged food being served, rather than foods produced within the institution:

> It is rather well understood by most informed prisoners that food in its unprepared state is of good quality. But when it is prepared and reaches those going through the food line it's sometimes quite a different story. Somehow, through some process, it has often become literally inedible: in appearance it is drab and even gross; its taste is tasteless; warm but seldom hot, and often cold. (Boomer, 1994, p. 6)

In 2018, there was a riot at Saskatchewan Institution over the poor quality of food and treatment of prisoners working in the kitchens, leading to the death of one prisoner and injuring dozens more (Office of Correctional Investigator, 2017; Prince Albert Daily Herald, 2016). Saskatchewan Institution is directly adjacent to Riverbend Institution, the former home of the largest and most diversified prison farm. It is hard not to draw a connection between the declining quality of food being served to prisoners and the closure of the prison farms. Thus, re-instituting a prison farm program that not only provides meaningful education and employment training opportunities, but also increases the availability of fresh fruits and vegetables makes sense on a number of levels.

Prisoner employment with fair compensation and working conditions

CSC does not consider prisoners to be employees (Ling, 2019a; Rashid, 2018). Rather than a wage, it considers the payment received by prisoners as incentive to participate in programming. A key consequence of this policy is that prisoners do not automatically have access to the same labour standards and protections as other federally employed individuals, nor are they paid the legal minimum wage. The maximum a prisoner can receive per day is $6.90 for full-time work (8 hours), however only a small minority receive that; the average is closer to $3/day (Brosnahan, 2013; Ling, 2019a). Either way, it is clear that prisoners earn less than 1$ per hour. To make matters worse, in 2012, CSC was directed by then-Public Safety Minister Vic Toews to discontinue "incentive pay" which provided prisoners with an additional $0.50-$2.30 per hour while working in CORCAN businesses (Fitzpatrick, 2012). This decision is puzzling, given the conclusion of CSC's own evaluation report in 2008 that "incentive pay is viewed as being a positive motivator and contributing to a sense of independence and self-sufficiency as well as productivity" (CSC, 2008). Since 2013, prisoner pay has also been subject to a 30% administrative deduction for room and board. This is in a context where phone fees are high and purchasing items from the canteen and the "national inmate purchasing catalogue" (Ling, 2019b) is increasingly a necessity rather

[7] While obesity is a problematic term often used to shame bodies of different shape and size, the terminology here illustrates the role that the prison environment plays in undesired weight gain.

than a choice (i.e. personal hygiene items, clothing and shoes, supplemental food from the canteen, over the counter medication, stamps and envelopes). Whether or not prisoners are formally recognized as employees eligible for wages comparable to free workers, they should nonetheless have access to fair compensation (adequate to cost of living) and decent working conditions for any labour performed.

Farm work can be meaningful and fulfilling, but it can also be gruelling, monotonous, physically strenuous and even dangerous. Any prison farm program that provides work opportunities to prisoners should ensure safe working conditions (particularly in relation to machine and equipment operations and proper lifting and harvesting techniques), sufficient training and rest periods, as well as career development. Indeed, the Corrections and Conditional Release Act requires that CSC "take all reasonable steps to ensure that… the living and working conditions of inmates… are safe, healthful and free of practices that undermine a person's sense of personal dignity" (Section 70, Corrections and Conditional Release Act).

Along with the closure of the prison farms in 2009-2011, the introduction of the Food Services Modernization Initiative in 2014 reduced the number of agri-food sector job and training opportunities for prisoners, as there was no longer a full kitchen at each institution preparing meals for prisoners (Office of the Correctional Investigator, 2015). It also led to the cancellation of the Culinary Arts Program in at least one prison, a certification that prisoners were able to get which helped them get a job in the food service industry once on the outside. According to Trevor D. Bell, prisoner at Mission Institution in BC, this program "was one of the longest running and successful programs at this facility, and was truly revered as extremely beneficial by all staff and prisoners" (2017, p. 210). Under the right conditions, reviving and expanding the prison farm programs is an opportunity to increase the number of employment opportunities available to prisoners.

Relevant and meaningful training, education and rehabilitation

Prison farm programs should provide prisoners with support, training and education that will increase their chances of successfully rebuilding their lives upon release. While prison is commonly seen as a place for people who have committed harm, it is equally true that prison is a place that causes harm. Many people come into prisons having experienced trauma, and many experience their time in prison as another form of trauma (McIsaac et al., 2016; Bodkin et al., 2019). Similarly, upon release former prisoners face multiple barriers to finding employment, in part because of the stigma associated with criminalization, compounded by gaps in their employment history. In response, prison farm programs (if properly implemented) provide opportunity to develop relevant and meaningful training, education and therapeutic interventions that counteract some of these broader structural realities.

3. Benefit the broader community

In addition to direct benefits to prisoners, the prison farms can also, and should also, have a positive impact on the surrounding communities. In Part One, we highlighted several possible negative impacts of the planned industrial goat farm. While, at a bare minimum, these programs should not negatively impact surrounding communities, we believe they have the potential to be a beneficial

asset. Internationally, many prison farm programs produce food for food banks and community food centres, something prison farms in Canada have done to varying degrees in the past. In fact, many prisoners have expressed a desire to give back and make positive contributions to the community; growing fresh fruits and vegetables for food insecure families is an excellent way to do this.

Other beneficial impacts include contributions to the local economy, through the purchase of agricultural inputs and services from local businesses and organizations. This was another element frequently mentioned in discussion over the closure and reopening of the prison farms – that the prison farms had a significant impact on the local economy, to the tune of $900,000[8] or more (Dowling, 2010). The models proposed in this report would see the prison farms develop a range of partnerships and collaborations with local community organizations and businesses to deliver its programming. However, as we have highlighted earlier, the central focus of the prison farm programs should be the creation of meaningful training, education and rehabilitation for prisoners. Any added economic benefits for the broader community should be considered as a secondary outcome.

4. Environmentally sustainable and regenerative

There is growing consensus within academic research as well as reports from government and non-governmental organizations that agriculture has an important role to play in our efforts to minimize and adapt to climate change (Senate Committee on Agriculture and Forestry, 2018; Qualman and NFU, 2019). Estimates vary widely, but a conservative analysis suggests at least 10% of greenhouse gas (GHG) emissions in Canada are directly attributed to conventional industrial agriculture, including the use of artificial fertilizers, fossil fuel combustion and synthetic pesticides (Environment and Climate Change Canada, 2016).

CSC has made its own commitments to reducing greenhouse gases, as well as waste and water consumption via its 2018-2020 Sustainable Development Strategy (SDS). By adopting organic and regenerative production methods that emphasize soil health, carbon sequestration and increased biodiversity, the prison farm program has the potential to be a flagship initiative for CSC's Sustainable Development Strategy. Further, the installation of solar power on marginal lands and the re-opening of the compost facility can increase renewable energy consumption and reduce landfill waste.

A 2018 report from the Standing Senate Committee on Agriculture and Forestry highlights the importance and value of organic production practices as key tools to help us move towards a more climate resilient and agro-ecological food system. As part of their recommendations, they emphasize the importance of increasing soil health and biodiversity, and reducing GHG emissions and the reliance on artificial fertilizer inputs. Beyond reducing our carbon footprint, sustainable farming practices can actually lead to carbon sequestration (Fan et al., 2019). Prioritizing organic farming practices that improve soil health and biodiversity will not only improve the health and well-being of prisoners and prison staff, it will position CSC as an innovative leader in climate resilience and environmental sustainability.

[8] This figure was frequently cited by supporters of the prison farms, but it remains an estimation, not a specific calculation.

The current context has exposed many of the inequalities and pressing issues facing communities across Canada, forcing many of us to reconsider what a just recovery could look like, to ensure we emerge from the COVID-19 pandemic stronger and more resilient as a society. Several proposals emphasize the role of agriculture and food systems to be leaders in tackling climate change and building more sustainable and resilient societies (Farmers for Climate Solutions, 2020; see also https://justrecoveryforall.ca/). Encouraging on-farm renewable energy generation and transitioning toward low-emission and low-input agricultural practices are two areas where prison farms could act as innovators and leaders, showcasing and testing emerging models and approaches. This includes organic and agro-ecological farming practices, installing solar panels on marginal lands and farm buildings, battery-powered machinery and energy-saving building retrofits (Qualman and NFU, 2019).

5. Limiting use of animals to therapeutic purposes

Historically animal agriculture has been a part of many, but not all, prison farms in Canada. Part One of this report has focused on the critiques and challenges associated with including animal agriculture within prison farms, leading us to recommend that animals should only be incorporated for strictly therapeutic purposes, under clear animal welfare standards, or not at all. Many advocates of prison farms cite the positive effects of providing prisoners with opportunities to care for and interact with animals. However, it is important to note that the vast majority of research on this topic comes from animal therapy programs, not situations in which animals are farmed, killed, or used for their by-products (Struthers Montford, 2019).

Gorgona Penal Colony in Italy offers a recent example of the conversion of an animal agriculture operation at a working prison farm, to a small-scale "human-animal project" intended to foster positive connections. The island's slaughterhouse was dismantled in June 2020, and the majority of farmed animals were sent to a mainland refuge, with 180 remaining on the island where researchers are collaborating with prison psychologists to study the rehabilitative benefits of the human-animal project devised by the University of Milan-Bicocca (Giuffrida, 2020).

We believe the most prudent approach is a prison farm program that incorporates animals only for the purposes of therapeutic intervention, with full public transparency as it relates to animal care, or not at all. Animal-assisted therapy is described as "a goal oriented, planned, structured, and documented therapeutic intervention directed by health and human service providers in which an animal that meets specific criteria is an integral part of the treatment process" (Villafaina-Domínguez, B. et al., 2020). CSC does have a policy on the treatment of animals for therapeutic purposes,[9] however it is unclear whether this policy was ever applied to the animals within the prison farms. The recent unexplained deaths of 14 calves (Cumming, 2020a) raise serious doubts about the capacity of CSC to provide adequate levels of care. As a result of this and other factors highlighted in Part One, the prison farm models outlined in this report focus on proposals that do not involve the use of animals in any capacity.

[9] According to CSC's guidelines: "The welfare of animals engaged in PFT [Pet Facilitated Therapy] programs is a crucial concern and should be given primary consideration when developing/implementing the program. …The therapy animal is in every way an individual. …PFT programs, when implemented effectively, demonstrate a positive addition to any facility… in such a way as to make a real difference in the lives of inmates, staff and the animals." (Correctional Service of Canada, 1998)

6. Towards de-carceral futures

The proposals outlined in this report seek to improve the conditions experienced by prisoners, and to use the prison farm program as an opportunity to make tangible improvements to the lives of prisoners, while making positive contributions to the broader community and environment. However, it is important to note that the root causes of many of the issues facing prisoners extend far beyond the limits of this analysis. Prison farms, regardless of their orientation or intention, cannot address the deep-seated injustices of the prison system, nor can they generate the scope of transformations sorely needed. This is in recognition of the growing evidence of the undeniable harms and trauma of prisons (Shook & McInnis, 2017; Hannah-Moffat, 2001; Kouyoumdjian et al., 2016), and the need to fundamentally rethink forms of punishment and accountability within Canadian society. In our analysis and recommendations, we have sought to avoid prison farm models that would lead to increased resources directed towards carceral systems, or further entrenchment of carceral systems in society. The question we sought to answer was, thus, how can prison farms contribute to more humane and just conditions within prisons in the short-term, while helping us to reimagine a de-carceral future over the long term?

Many of the principles outlined above are in line with the key objectives of the Correctional Service of Canada, which are, according to the *Corrections and Conditional Release Act*, *s.5*:

1. The care and custody of inmates
2. The provision of programs that contribute to the rehabilitation of offenders and to their successful reintegration into the community
3. The preparation of inmates for release
4. Parole, statutory release supervision and long-term supervision of offenders
5. Maintaining a program of public education about the operations of the Service

Prison farm programs and activities have the potential to make significant contributions to the first three objectives, with a particular emphasis on Objectives 2 and 3. Beyond an alignment with CSC objectives, prison farms can, and should, improve the lives of prisoners, but also make positive contributions to the broader community and surrounding environment. It is important to note that simply declaring a particular mandate is not sufficient; the creation and implementation of programs and activities that reflect this mandate must follow. CSC has long claimed to offer meaningful training and rehabilitation opportunities for prisoners, despite critiques from community advocates, the Correctional Investigator, and prisoners, that suggest otherwise.

Addressing the many challenges and problems with our current correctional system is far beyond the scope of this report (for one recent synthesis, see the Standing Senate Committee on Human Rights' 2019 report). However, an important starting point is acknowledging the racialized, classed and colonial underpinnings of our society's current approach to crime and punishment (Office of the Correctional Investigator, 2017; Maynard, 2017; Office of the Correctional Investigator, 2014; Ling, 2019a; Chartrand, 2019). Our approach to the prison farms is to explore how they could be transformed to improve the lives of prisoners, while recognizing that the Canadian prison system must undergo a much broader transformation to rectify its many harms.

JOYCEVILLE AND COLLINS BAY INSTITUTIONS: AGRICULTURAL PROFILE

Joyceville and Collins Bay are multi-level institutions with both minimum and medium security levels, which are described by the Correctional Service of Canada as providing an environment that encourages prisoners to be more responsible for day-to-day life. Compared to maximum-level institutions, medium and minimum security institutions are said to allow more interaction among prisoners and increased opportunities for employment and training (CSC, 2019d).

Below we present the overall agricultural profile of both institutions where the new prison farms are being introduced as a pilot project, as well as our overall recommendations in terms of production approaches. In reviewing the soil type and quality, and acreage of both institutions, it is clear they have suitability for a broad range of agricultural activities.

Acreage

Collins Bay Institution itself is only 28 acres, but it is located on a Federal Reserve land parcel that is approximately 800 acres, with approximately 450-465 workable acres (Clark Consulting Services, 2007; MacAlpine, 2019). Joyceville Institution is a similar size with just under 450 workable acres (CSC, 2019c). For comparison, the average sized farming operation in Canada is 820 acres, however this is largely due to bigger farms in the Prairies. In Ontario, the average farm size is 249 acres (StatsCan, 2017), making the Joyceville and Collins Bay prison farms significant farming operations for the region.

Historically, the production of fruit and vegetables to feed prisoners has only occupied a very small portion of the overall available lands at these two institutions. Similarly, horticulture therapy programming and personal gardens for prisoners have been at quite a small scale. At present, active production is focused on cash crops, with only nominal space and resources directed to other possibilities. Given the large acreage available, and the good-quality farmland, this is a missed opportunity to develop a much more diversified and impactful prison farm program.

The City of Kingston's own Agricultural Study made note of the potential for the prison farms at Joyceville and Collins Bay to expand its production for both research and marketing purposes:

> Note should be made in the Official Plan of these Institutions and their significance for agricultural and farming operations. Opportunities exist for the farming community to make a broader use of these facilities both for research and for marketing and distribution of produce. This is particularly relevant in view of the more dispersed processing and marketing of facilities available to local farming operations.[10] (Clark Consulting Services, 2007, p. 10)

While the focus of the above analysis was on the potential of the prison farms to contribute to the broader agri-food system in the Kingston region, the same potential exists for production focused on feeding prisoners and community food organizations.

[10] This report proceeds to highlight "a growing concern with large industrial scale farming... Concerns range from smell and odour to questions of sustainability, resource use and safe manure storage and disposal… Recent experience suggests these specialized operations are vulnerable to unforeseen market forces and disruptions." (Clark Consulting Services, 2007, p. 10)

Soil type

Both institutions have predominantly clay soils (Lansdowne and Napanee Clay); Joyceville also has areas of loam (Farmington Loam). With predominantly clay soils, the main concerns in establishing a production plan are compaction and the development of a crust layer on the surface that interferes with drainage. They are a mix of Class 2 and 3 (see maps for further detail), suggesting good suitability for a broad range of crops. Joyceville also has sections of Class 5, which is generally suitable only for forage crops or pasture, or possibly renewable energy production (land must be classified as Class 4 or higher to allow for solar installation, so as not to remove prime agricultural land from production). Joyceville also has a small section of Class 7. Both properties have some fields that are tile drained; the presence of subclasses D and W suggest that drainage could be improved through additional tile drainage.

Class 2 Soils: "have moderate limitations that restrict the range of crops or require moderate conservation practices. Class 2 soils are deep and have good water-holding capacity. Limitations are moderate and crops can be grown on these soils with little difficulty. The limitations of the soils in this class may be for example, adverse regional climate, moderate erosion, poor soil structure or low fertility which is readily correctable."

Class 3 Soils: "have moderately severe limitations that restrict the range of crops or require special conservation practices. Although these soils have more severe limitations than those in Class 2, they are still fair to moderately high in productivity for a fairly wide range of field crops adapted to the region. Limitations may be a combination of those described under Class 2, or are of the following; moderate climatic limitations, moderately severe erosion, intractable soil mass or very slow permeability, correctable low fertility, moderate to steep slopes, frequent runoff accompanied by crop damage, stoniness necessitating some clearing, etc. Classes 1 to 3 are considered to be capable of sustained annual production of common cultivated crops."

Class 5 Soils: "have very severe limitations that restrict their capability to produce perennial forage crops. Class 5 soils have such serious physical, climatic or other limitations that they are not capable of use for sustained production of annual field crops. Class 5 soils are amenable, however, to improvement and, with intensive management practices, may be used for permanent pasture. The limitations described in Classes 2 to 4 may be present for Class 5 areas. Cultivated field crops may be grown in Class 5 areas where adverse climate is the main limitation but crop failures will occur under average conditions. Soils of Classes 4 and 5 are considered suitable for most varieties of forage crops."

(Canada Land Inventory, 1978)

Table 1
Soil type and class

	Collins Bay	Joyceville
Soil Type[11]	● Lansdowne Clay (2D) ● Napanee Clay (3W)	● Lansdowne Clay (2D) ● Napanee Clay (3W) ● Farmington Loam (5R)
Soil Class	● Class 2 ○ Subclass D ● Class 3 ○ Subclass W	● Class 2 ○ Subclass D ● Class 3 ○ Subclass W ● Class 5 ○ Subclass R ● Class 7 ○ Subclass R

Notes:
Lansdowne Clay: gentle slope, often experiences water saturation
Napanee Clay: generally poorly drained, average clay content 45%, low organic matter
Farmington Loam: generally high organic matter, flat soil surface
D (Undesirable Structure and/or Low Permeability) = "critical clay contents in the upper soil profile" – indicates soils are prone to compaction and likely absorb and release water more slowly
W (Excess Water) = this subclass refers to the presence of excess soil moisture, which could be the result of inadequate drainage or a high water table
R (Shallowness to Consolidated Bedrock) = this subclass indicates the presence of bedrock at a level that would interfere with typically rooting depth (100 cm from the surface)

Both institutions are located in regions with a 6a hardiness zone, which lends itself to a range of fruit, vegetable and nut crops, as well as some frost sensitive fruits on a more experimental basis.

Vegetable production generally requires a soil that is well drained with a high level of organic matter (generally between 3-6%, but for clay soils, 5% or higher is desirable) (Fenton et al., 2008; Magdoff and van Es, 2010). It is recommended that soil testing be completed prior to finalizing any crop plans, so that any necessary amendments can be added, along with the development of a long-term nutrient management plan. Key nutrients to consider include phosphorous, potassium, nitrogen, as well as monitoring pH levels. It is likely that CSC has already conducted some degree of soil testing, however that information has not been made public. An Environmental Effects Evaluation was completed for Joyceville in 2018, which notes of possible soil and groundwater contamination from previous farm activities, as well as the presence of two species at risk within the farm properties and possible habitat for other at-risk species (A & A Environmental Consultants, 2018). Similarly, a 2018 Species at Risk Survey completed for Collins Bay Institution found the presence of several species-at-risk and makes recommendations related to field management and rotation to minimize the impact on their habitats (Natural Resource Solutions Inc, 2018). While these are helpful starting points, it is important to note that these assessments were done in reference to the proposed goat dairy operation and related building demolition and construction. A separate assessment may be required for the models proposed in this report.

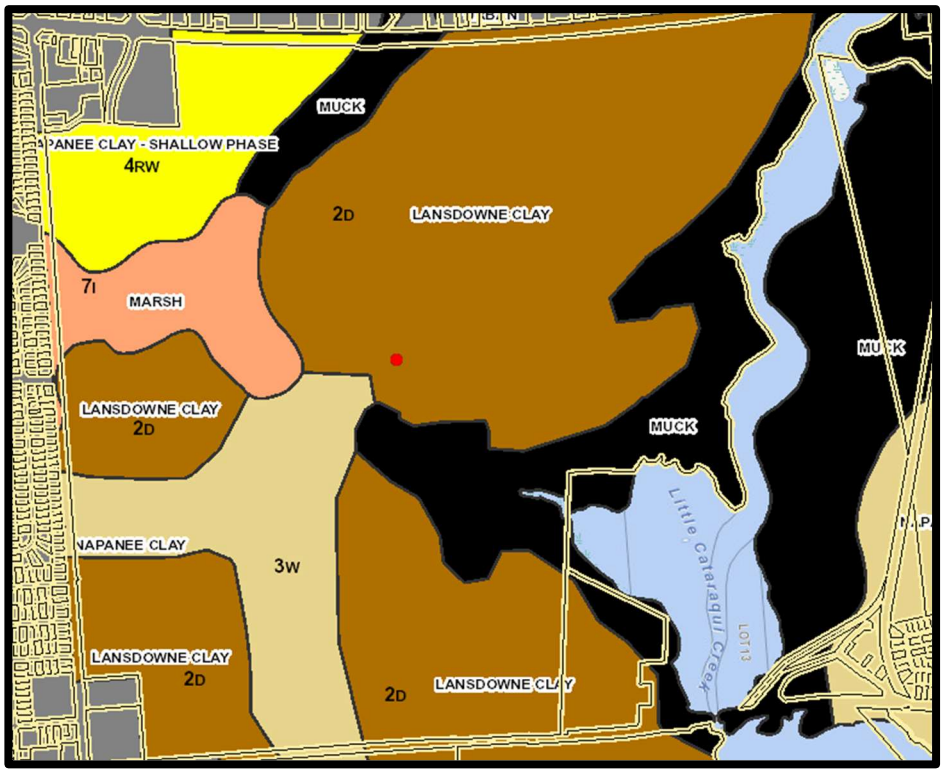
[11] This information is based on the Canadian System of Soil Classifications.

COLLINS BAY INSTITUTION

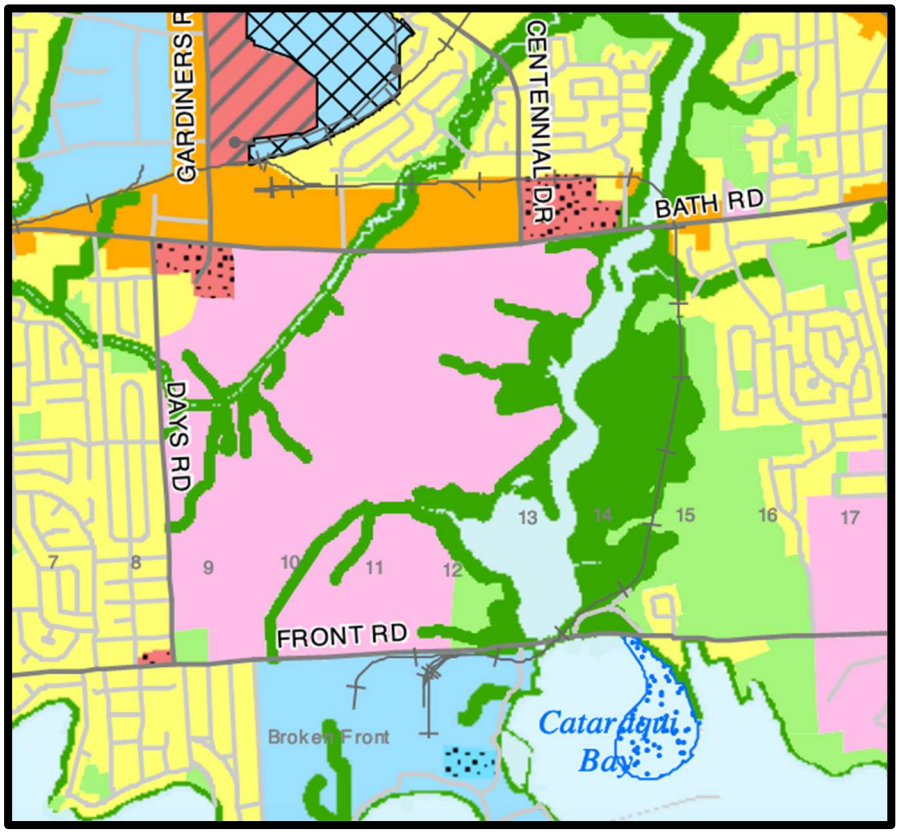
A **AERIAL VIEW OF COLLINS BAY, GOOGLE MAPS 2020**

B **SUGGESTED INITIAL PRODUCTION AREAS HIGHLIGHTED IN WHITE.**

C **CURRENT VEGETABLE GARDEN AREA**



D **SOIL TYPE AND CLASS**



E **ZONING MAP, IDENTIFYING INSTITUTIONAL BOUNDARIES (OMAFRA AGRICULTURE INFORMATION ATLAS)**

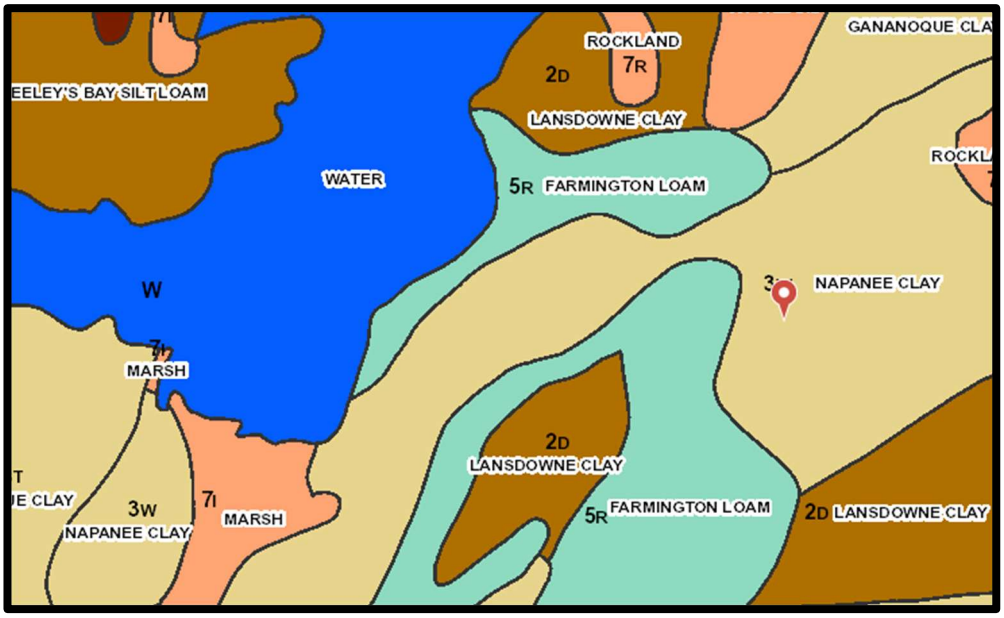
JOYCEVILLE INSTITUTION

G **AERIAL MAP OF PRISON FARM LANDS, GOOGLE MAPS, 2020**

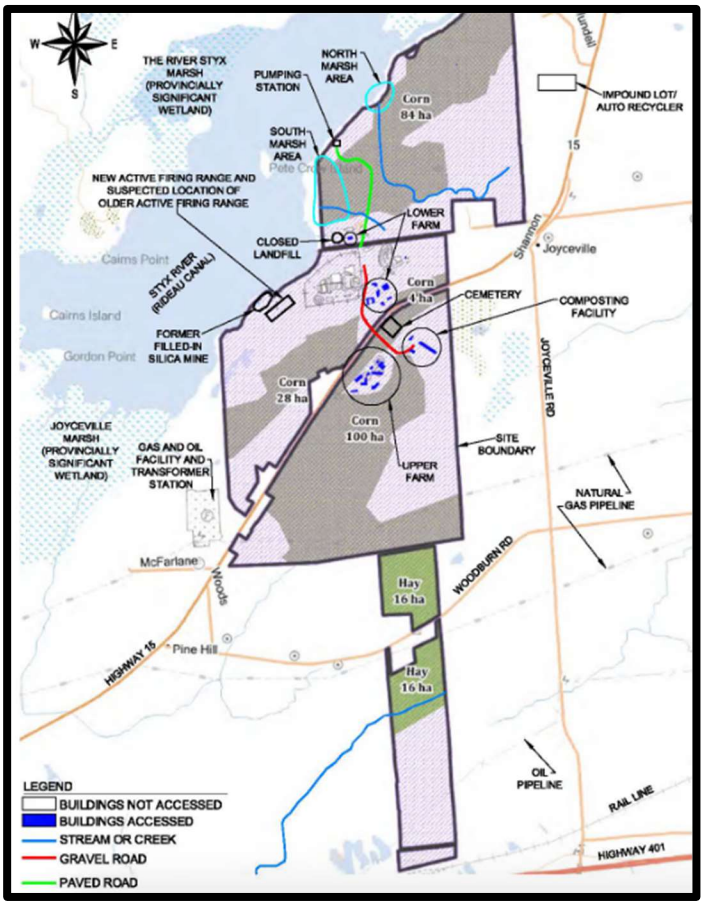
F **SUGGESTED INITIAL PRODUCTION AREAS HIGHLIGHTED IN WHITE.**

Note: According to an Environmental Review conducted by Golder Associates, a small area next to the abattoir buildings on the Pittsburg side required soil remediation and ongoing groundwater monitoring to assess potential contamination (Golder Associates, 2014).

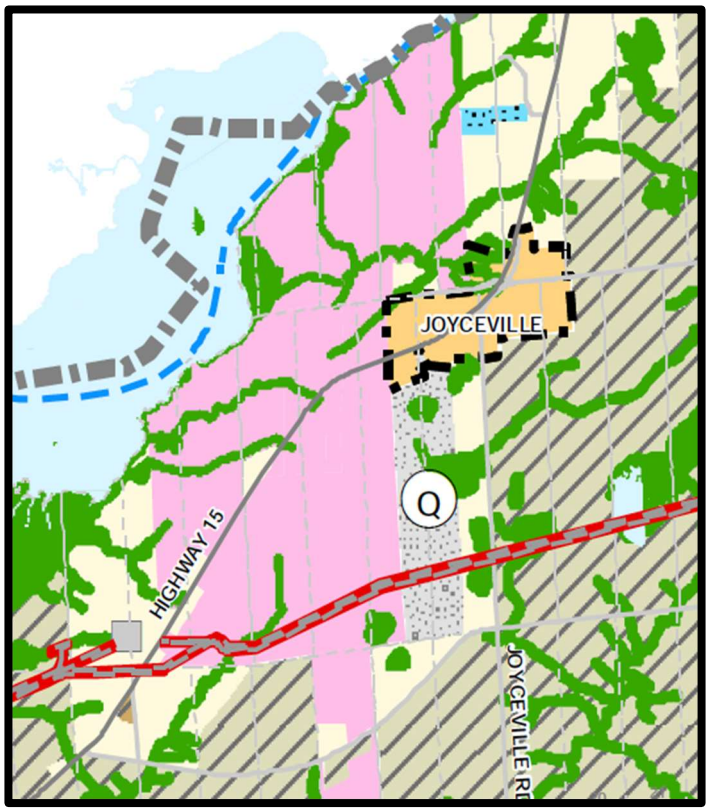
H **CLOSE-UP OF THE ABATTOIR BUILDINGS AND GREENHOUSES ON THE PITTSBURGH SIDE**



I **SOIL CLASS AND TYPE (OMAFRA AGRICULTURE INFORMATION ATLAS)**



J **INSTITUTIONAL MAP (GOLDER ASSOCIATES 2014)**



K **ZONING MAP IDENTIFYING INSTITUTIONAL BOUNDARIES (OMAFRA AGRICULTURE INFORMATION ATLAS)**

Crop planning and production models

A diversified farm model provides several benefits. Crop and production diversity provide better overall resilience and adaptation to yearly fluctuations in weather (heat, moisture levels, extreme weather events); in addition, it maximizes the learning and employment training available to prisoners. Outlined below is an approach that includes both large-scale crop production as well as intensive market-gardening style production.

Depending on the objectives of the prison farm program, different crops and production methods will be preferable. For instance, if the primary focus of the program is prisoner training and employability, a larger-scale, more mechanized production model will provide prisoners with opportunities to gain valuable hands-on experience in machinery repair and operating machinery and heavy equipment. On the other hand, if the program adopts a horticultural therapy model, more intensive, manual production methods will be preferred, which maximizes an individual's interaction with the plants and garden environment. To accommodate horticulture therapy programs and/or agri-food education and training programs, sections of the farm could easily be converted to a smaller, more intensive bed system.

We recommend a farm design that incorporates different scales of production, depending on the overall acreage in production, to accommodate each of the three models proposed.

- Raised beds, which provide improved drainage and meet accessibility requirements (¼-½ acre)

L **A PRISONER (JAMES) AT RIKER'S GREENHOUSE PRISON GARDEN. PHOTO CREDIT: LUCAS FOGLIA**

M **GRAFTON COUNTY PRISON FARM. PHOTO CREDIT: ELODIE REED**

- Intensive bed system that uses a mix of mechanical and manual weeding and harvesting (1-5 acres)

- Mechanized production (10+ acres)

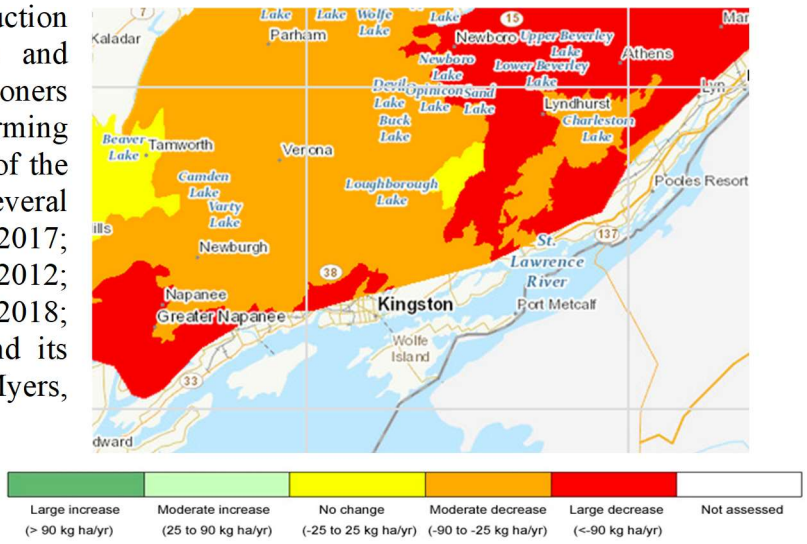
N **PHOTO CREDIT: NORTH CAROLINA DEPARTMENT OF PUBLIC SAFETY**

In line with the models and recommendations outlined in this report, we recommend the prison farm programs at Joyceville and Collins Bay start with the following:

- Permanent raised beds = 10,000 ft^2
- Intensive market-garden (5 ft rows) = 1-5 acres
- Field crops = maintain current production scale at both institutions, transition to organic

Organic production

Overall, we recommend organic production methods for several reasons. First and foremost, it poses the least risk to prisoners and CSC staff involved in the farming operations. There is growing evidence of the serious health impacts of exposure to several pesticides and herbicides (Kim et al., 2017; Benachour et al., 2007; Bolis, 2012; Bouchard et al., 2011; Équiterre et al., 2018; IARC, 2015; Zhang et al., 2019), and its impact on the broader environment (Myers, 2016). There are also serious health questions about the health impacts of consuming food products grown with the use of pesticides or herbicides (Cohen, 2007; Rekha & Naik, 2006; Holden, 2019; Zikankuba et al., 2019). Organic production methods, by contrast, prioritize the long-term health of the soil – a key ingredient to any successful farming operation



O **SOURCE: AGRICULTURE AND AGRI-FOOD CANADA, SOIL ORGANIC MATTER INDICATOR, 2011**

(Reeve et al., 2016; Lynette et al., 2015; Suja, 2013; Lupatini et al., 2017). In addition, as a growing industry (COTA, 2017, 2019), giving prisoners the opportunity to develop skills and knowledge specific to organic production and certification systems will increase their employability once released.

Agriculture and Agri-Food Canada notes a moderate to large decrease in soil organic matter within Eastern Ontario (measured as a change in kilograms per hectare, per year), meaning that building organic matter in the soil is all the more important (AAFC, 2011). A meta-analysis conducted by Bengtsson et al. (2005), comparing biodiversity on organic vs. conventional farms, concluded that organic farming generates approximately 30% higher species richness and 50% higher abundance of organisms compared to conventional farms. Several other notable prison farm programs utilize organic production methods. Oregon State Correctional Institution, for example, is said to be almost entirely organic (Alvarez & Patil, 2017).

For more information on organic production see https://www.cog.ca/home/about-organics/what-is-organic/. Note that for certification purposes the land must be without prohibited substances for a minimum of 36 months. Depending on the distribution model selected, certification may or may not be necessary, or desired. The Canadian Organic Growers (COG) have been running an innovative project entitled Growing Eastern Ontario Organically (GEO-O) that offers training, mentoring and on-site experiential learning to support farming operations in the transition to organic agriculture. There may be an opportunity for CSC to collaborate with COG, to draw on the resources and expertise developed through this project, and to support the transition of prison farms to organic production methods.

Season-extension and year-round production

Remarkable innovations exist to extend the growing season, and in certain cases to enable year-round production. This is an important element of an effective prison farm program as it allows the educational and therapeutic programming to extend beyond the typical growing season.

The use of greenhouses is a well-established method for extending production into the early spring and late fall. High tunnels (or hoop houses) are the most widely used – relatively inexpensive "passive solar structures" that extend the season by protecting plants from adverse weather conditions (in particular frost and wind). High tunnels are generally soil-based growing systems. Depending on the polyethylene film thickness, and whether the greenhouses are heated (wood, propane or gas), greenhouses can extend the season by weeks or even months. Bluegrass Farm, an organic vegetable farm near Smith Falls, Ontario, has established an innovative heated greenhouse system that enables them to produce year-round. Their greenhouses are heated using radiant floor heating, fueled by a wood-fired broiler. In 2015, they were awarded the Premier's Award for Agri-Food Innovation Excellence. Joyceville Institution currently has seven greenhouse structures, however their condition is unknown, and they will likely require considerable repairs. At the very least they would require new poly film.

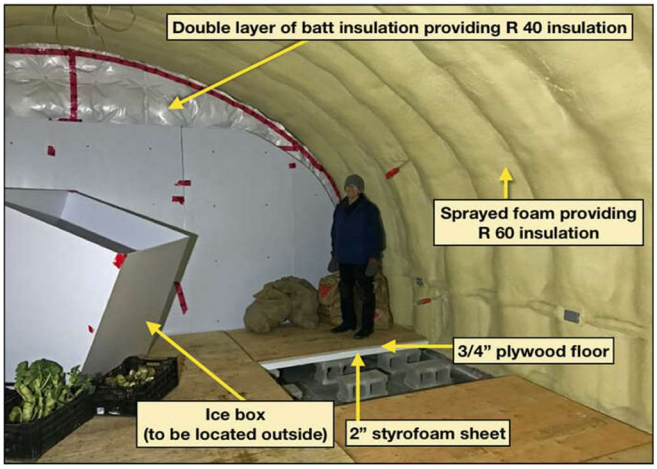
Hydroponic greenhouses, or fully heated greenhouses, provide added season extension, but at greater cost. SunTech Greenhouses, south of Ottawa, are one such example. On roughly four acres, they grow primarily tomatoes and other vegetables year-round in a climate similar to that of

Joyceville and Collins Bay. However, the upfront investment was over $1 million in 2015 (Hein, 2016).

In recent years there has been an explosion of modular indoor growing systems (also referred to as container or vertical farms) – everything from modified shipping containers to indoor growing towers. Examples include Food Security Structures, as well as Local Leaf Farms, based in Kingston. These are usually soilless growing systems, meaning plants are grown in a medium of water and nutrients. By definition soilless growing systems are not organic, and the nutrients are typically chemically derived (similar to chemical fertilizers in conventional farming) rather than from natural sources. They can also be very resource intensive, in terms of energy consumption and nutrient inputs, in addition to a hefty price tag. For instance, a unit from Freight Farm costs over $100,000 USD and uses between 150-165 kWh of energy per day (Freight Farm, 2020). The co-founders of the Growcer estimated the cost to install one of their units and train staff to be $200,000 (University Affairs, 2020) with the unit itself costing in the range of $140,000 (Feibel, 2017). Given that there is ample acreage available at the prison farm sites, in general we would recommend the use of high-tunnel greenhouses to provide season extension, rather than indoor growing systems for year-round production. Indoor growing systems may be worth exploring on a smaller scale to provide a year-round supply of greens, as well as year-round employment and programming opportunities for prisoners. Year-round programming could also be achieved through storage (discussed below) as well as the development of food processing programs.

Another, complementary option would be building a cold storage facility. This would enable the prison farms to store a variety of crops (potatoes, cabbage, beets, carrots, squash, sweet potatoes, apples) and make use of them throughout the winter.

One example comes from the Deep Roots Food Hub, west of Ottawa. The community non-profit organization built an off-grid cold storage facility for use by area farmers. Heated by ground-sourced geothermal heat, it can store an estimated 60,000 lbs of produce (Deep Roots Food Hub, n.d.).



P **COLD STORAGE CELLAR, DEEP ROOTS FOOD HUB**

Equipment needs

A diversified prison farm program growing mixed fruits and vegetables would require different tools and equipment depending on the different production methods used. At a minimum, we could suggest the following:[12]

[12] It is likely that CSC already has some of this equipment given the previous and current crop production.

3 tractors, each with 3-point hitch and power take-off (PTO):[13]

- 40-50 horsepower (possibly up to 75h depending on acreage) with front loader
- 30-45 horsepower – bed preparation, cover crops management
- Small cultivating tractor (creeper gear, PTO)

Implements:

- Cultivator (rotary plow or spader) (primary tillage)
- Flail mower
- Seed drill
- Field cultivator, spring harrow (secondary tillage)
- Potato digger
- Cultivator (weeding)
- Bed shaper or disc hillers (for raised beds)

Other:

- Bird and insect netting, row covers
- Irrigation system
- Garden carts and wheelbarrows for harvest and transportation within raised beds and rows
- Hand tools for raised beds and intensive production models (ex. wheel hoes, loop hoes, bow rakes, round point shovels, greens harvester, harvest knives)

Buildings/infrastructure

As can be seen on the maps of both sites, there are several existing farm buildings. CSC is also apparently in the process of constructing two grain storage bins at Collins Bay (MacAlpine, 2019) and barns are being retrofitted with new barn construction expected at Joyceville for the proposed goat-milking operation. The following is a list of required infrastructures for the models outlined in this report – the existing and planned prison farm buildings could easily be retrofitted to meet the requirements:

- New greenhouse poly film for Joyceville greenhouses (6 inch) and any necessary greenhouse repair

[13] This equipment lists assumes that the use of combine harvesters for cash crops such as corn or soy would be procured through service agreements with area farmers.

- Small seedling greenhouse for Collins Bay
- Cold storage building for long-term storage
- Walk-in fridge for post-harvest and short-term storage (farms frequently retrofit a section of an existing building or a shipping container with insulated walls and a CoolBot)
- Pack house and wash station – new build or retrofit of existing building (requires a concrete floor or gravel for water drainage as well as large wash sinks or tub basins)
- Tool storage shed, and machine shed for equipment storage and repairs

Staffing

CSC's budget for reinstating the prison farm includes staffing costs of $832,000 per year (Cumming, 2020a). At present, the prison farms at Joyceville and Collins Bay have 6 farm instructors employed between the two sites (4 full-time and 2 part-time) as well as a CORCAN Farm Manager (MacAlpine, 2019).

Without knowing the precise salaries of correctional staff working (or having previously worked) within the prison farms, it is difficult to provide a precise human resource costing analysis of the models presented. However, based on an evaluation of publicly available collective agreements, job board sites and CSC's recruiting portal we estimate the following annual salaries for possible prison farm personnel, based on the models proposed in this report. This does not include payment to prisoners working as part of the program.

Table 2
Estimated annual salaries for alternative prison farm models

Personnel	**Salary or Hourly Wage**
Agro-Food Education and Training Coordinator: 1 (individual courses to be taught through service agreements negotiated with outside organizations)	$70,000
Horticulture Therapist (MA-level social worker): 1	$85,000
Farm Manager (comparable to building services worker): 1	$65,000
Food and Farm Staff and Instructors: 6, part-time, 35$/h	$205,000
TOTAL	**$425,000**

Current production activities at Joyceville and Collins Bay

As of 2019, the prison farms at Collins Bay and Joyceville already had several hundred acres in production, however it was predominantly commodity field crops including barley, soybeans, hay and corn. While current production is conventional, one field at Collins Bay has apparently been identified for future organic production (MacAlpine, 2019).

According to Chris Stein, CORCAN Operations Manager, there are plans to allow prisoners to grow vegetables for their own consumption (for prisoners in the minimum security sections) as well as to donate to local food banks.[14] According to a CORCAN statement, there are also plans for trees, native species, and flowers: "CSC and CORCAN are working with various partners to incorporate flowers, plants and trees as part of developing environmentally friendly aspects into the farmland and to contribute to natural species in the area, as well as items for use in cultural ceremonies" (MacAlpine, 2019). These statements are encouraging, and if implemented, would indicate a positive shift in the prison farms program. However, at present, there is little in the way of details on the actual implementation of these activities, and important questions remain as to the scale and scope of these proposals. The models outlined in this report have taken these initial plans into consideration and provide a pathway for CSC to expand and deepen these initial planned activities.

In the subsequent sections we outline three proposed program models for CSC's prison farms: (1) food production for prisoners and community food organizations, (2) horticulture therapy and (3) training and employability programs. These models are not mutually exclusive, in fact we recommend developing a prison farm program that incorporates elements of all three of the models discussed. Taken together, these models offer a framework to develop a sustainable and beneficial prison farm program supporting prisoners and the broader community, and contributing to the health of our environment.

MODEL #1: FOOD PRODUCTION FOR PRISONERS AND COMMUNITY ORGANIZATIONS

Food for prisoners[15]

Prison farms in Canada have a long history of producing food to be consumed by prisoners. While historically, this was partly driven by a misguided and harmful belief that prisoners should perform hard labour as part of their sentence (Struthers Montford, 2019), it also provided prisoners with regular access to fresh and nutritious foods. While the prison farms at Joyceville and Collins Bay were best known for their dairy operations, both sites also housed other agricultural activities, and farms at other CSC institutions had diversified operations including a range of fruit and vegetable crops. For instance, back in the 1970s, the Riverbend prison farm in Prince Albert was considered the largest and most diversified prison farm in Canada, with over 40 prisoners growing "grains and nearly every type of vegetable on 1,800 acres" (Prince Albert History Blog, 2019). Not so long ago, CSC was actively seeking to increase the amount of food produced for prisoners at the remaining prison farms. In 1983, CSC stated a goal of 30% of food for prisoners coming from the prison farms and hoped to increase that percentage in the coming years (CSC, 1983).

[14] The production of food for food banks has taken place for many years on the grounds of Kingston-area prisons. However, it is important to note that these gardens are not formally part of the CORCAN prison farms, and are relatively small in size.

[15] In this section we make use of the terminology of both prison garden programs and prison farm programs. The distinction between the two usually comes down to size and associated production model and use of machinery. However, these are not hard and fast distinctions, and thus they may be used interchangeably.

As mentioned in the previous section, both Joyceville Institution and Collins Bay Institution have a strong agricultural profile that makes them well suited to a diversity of food crops and production models. Given the relatively large size of both sites, focusing on the production of fruits and vegetables to incorporate into CSC food services could substantially improve the availability of healthy meals in both institutions.

The introduction of the Food Services Modernization Initiative (FSMI) in 2014 made several changes to the food services in prisons, including switching from fresh milk to powdered milk. As noted by CSC staff, this meant it would be very difficult to re-incorporate milk produced on prison farms back into food services. However, fruit and vegetables do not face the same obstacles, particularly as most vegetables are added to meals in the finishing kitchens of individual institutions, as opposed to the regional distribution kitchens where meals are "cook-chilled." This means it should be feasible to incorporate fruit and vegetable products produced at prison farm sites. The proposed food production model below would see prisoners, in collaboration with CSC staff, produce a range of fruits and vegetables that could be incorporated into the food service, or sold through the canteens or through prisoner fundraisers.

Production for community food organizations

Many prison farm programs internationally include donations to local food organizations and food banks. Whether surplus from food produced for prisoners, or harvests from horticulture therapy programs, prison farms can be a great way to give back to the community and support food insecure households.

It is important to note that research on food insecurity suggests that the roots of food insecurity are not a lack of food, but a lack of income. The problem is not that grocery store shelves are bare, but that individuals and families lack the necessary resources to purchase or procure healthy, affordable and culturally appropriate foods. In the context of COVID-19, this dynamic has become all the more clear. The lack of food is not the problem, in fact many producers experienced unprecedented levels of surplus as many of their restaurant suppliers dried up. However, this does not mean the food automatically lands in the hands of those who need it. The federal government recently announced funding to support efforts to direct that surplus food to area food banks and community centres (Harris, 2020). Thus, prison farms producing food for food banks can support short-term responses to food insecurity, though not necessarily addressing the underlying causes.

Many prisoners appreciate the opportunity to give back to the community (Timler et al., 2019). When the Conservative federal government brought in a slew of changes to federal prisons in 2006-2011, one of the complaints raised by prisoners was that they were no longer able to hold group food drives. For instance, the Inmate Committee at Bath Institution conducted a consultation with prisoners to generate a list of things they thought should be changed; at the top of their list was the reinstatement of group food drives. They were upset that they were no longer able to organize food drives to raise money for organizations in the community that they cared about, something that enabled them to maintain a connection with the community: "Group food drives enabled us to maintain community contact and raise money for organizations such as the Make a Wish Foundation. I would like to see a return to the previous policy" (Anonymous Bath Prisoner 1, 2017). Even during the current pandemic, prisoners at both Collins Bay and Joyceville made

cash and food donations to the food bank and the Humane Society (Mazur, 2020), as well as a local animal shelter (Joyceville Inmate Committee, 2020).

Collins Bay currently has a Grow-A-Row partnership with Loving Spoonful, where a portion of produce from prisoners' personal gardens is donated to the Kingston-area community food organization. Grow-A-Row programs are a common feature of community gardens and local food systems, whereby farmers and gardeners plant and grow an extra row of food to donate. In Kingston, Loving Spoonful coordinates this program and facilitates drop-offs and donations to local agencies and fresh food market stands (free, fresh food available to individuals in communities in need). There is ample opportunity to significantly expand this partnership. For example, Caledonia Correctional Institution in the United States runs a 5,500-acre farm. Most of the produce goes towards feeding prisoners, however any surplus harvest is donated to their local food bank. Between 2009-2014 the prison donated over 2 million pounds of food (Brumbaugh, 2014). While their farm is considerably larger than the farms at Joyceville and Collins Bay, the example nonetheless highlights the potential beneficial impact Canada's prison farms could have.

Objectives and possible outcomes

Improving the availability of healthy foods within prisons and community food organizations is the most direct benefit of a prison farm program focused on growing food for prisoners or the community; however, it is not the only one. It can also reduce institutional costs by providing a low-cost reliable source of fresh fruits and produce, provide employment opportunities for prisoners, and positively contribute to the local economy of the regions in which they are located.

For 2017-2018 (the most recent data available), CSC spent a total of $54,587,374 on Food Services (which includes $22,448,275 in Salaries and $32,139,099 in Operations and Maintenance) (CSC, 2019b). Divided by the 14,015 prisoners in federal custody, that equals $3,895 per prisoner. CSC policy allows for a maximum of $5.41 to be spent on food per prisoner per day ($1,974.65 annually), however CSC does not release information on the breakdown of that cost according to categories of food. This makes it impossible to provide a specific projection of the possible financial impact of (re)incorporating fruits and vegetables grown on the prison farms into Food Services. In addition, estimates of the revenue per acre for intensive organic mix-vegetable production vary widely – anywhere from $15,000 to $100,000 per acre, depending on crops, production techniques and market access (Frost, 2016; Acorn Organic, 2014).

Under the previous prison farm model, CSC did not release details of the cost savings of producing its own milk, eggs and produce, however other prison farm programs have noted significant savings. Corrective Services in New South Wales reported a cost savings of over $3.5 million a year through their prison farm program that engages prisoners in a variety of production and processing roles (Chettle, 2014; Connor, 2018). Washington State Penitentiary reported an annual savings of $122,677 as a result of produce from its 10.5-acre prison garden program in 2018.

The Sustainability in Prisons Project, a partnership between Evergreen College and Washington State Department of Corrections, oversees a range of prison farm and garden projects. The table below provides a snapshot of how much produce is produced at various institutions.

Table 3
Annual production yields of prison farms

Institution	Size of gardens	Pounds of food produced
Cedar Creek Corrections Center	40,000 ft^2	8,500 lbs
Airway Heights Corrections Center	100,000 ft^2	37,000 lbs
Clallam Bay Corrections Center	5,850 ft^2	1,200 lbs
Mission Creek Corrections Center for Women	10,890 ft^2	12,000 lbs
Stafford Creek Correctional Centre	25,000 ft^2	36,036 lbs
Washington Correctional Centre	43,560 ft^2 + 1,440 ft^2 greenhouse	41,840 lbs
Washington State Penitentiary	457,380 ft^2	110,000 lbs

(Source: Sustainability in Prisons Project, 2008; see also Trivett et al., 2013, for similar calculations)

Taken together, these institutions are producing an average of 27,878 lbs of produce per acre (or 0.64 lbs/ft^2). Given that the majority of prisons in Washington State are located in climates that are 1-2 hardiness zones higher than the Kingston region, a more conservative average of 0.5 lbs/ft^2 is likely appropriate, which would equal 21,780 lbs per acre. These numbers would undoubtedly fluctuate depending on the particular crops grown. Lettuce, compared to squash or potatoes, would clearly have a much different productivity in terms of weight and space required. Taken together, this data suggests that CSC could produce a significant amount of food that could have a noticeable impact on its annual food budgets.

Prisoner employment is another potential beneficial outcome of growing food for prisons and the community. CSC estimates that the fully implemented prison farms in Kingston will create up to 60 work positions of some kind for prisoners[16] (Cumming, 2020a). Leaving aside questions as to whether this is a realistic estimate for the highly mechanized and automated system proposed by CSC (see Part One of this report for further discussion), it is entirely reasonable to assume an equal or higher level of employment opportunities for prisoners under the model discussed in this section. Fruit and vegetable production is a much more labour-intensive operation than goat milking (or cash crops); furthermore, organic production methods lead to greater employment per acre of production than conventional farming (Finley et al., 2018). CSC should be actively seeking opportunities to increase meaningful prisoner employment opportunities; the labour costs are minimal but the impact for prisoners can be substantial. The possible employment opportunities for prisoners go far beyond field work. For instance, Caledonia Prison Farm in North Carolina

[16] It is unclear whether these positions would be full or part-time, seasonal, temporary etc. According to internal documents obtained through Access to Information request, the average amount of time a prisoner spends in CORCAN employment is 3-6 months (CORCAN, 2018a).

employs prisoners as forklift and equipment operators, tractor drivers, inventory managers, office clerks, maintenance workers and cannery workers (Hart, 2017).

Fruit and vegetable crops, as well as other forms of plant-based agriculture, also have the benefit of a more flexible schedule compared to farmed animal operations. Milking tends to have a very strict schedule, over a 24-hour period, which does not necessarily easily fit with prison schedules. Production and harvest schedules could easily be developed to fit within other programming and daily requirements.

As we noted in the previous section on Key Principles, it is important that any prisoner work opportunities provide adequate compensation and health and safety protections, as well as meaningful training and skill development. Fruit and vegetable farming can be labour-intensive operations. This can provide employment and training opportunities for prisoners, but it also requires an investment on the part of CSC to ensure sufficient well-trained human resources are available to oversee the farm management. This includes knowledge of the particular crops as well as organic production methods.

Promising practices

The following examples provide a snapshot of the successes and lessons learned from prison farm programs growing food for prisoners and/or that donate food to the community.

Farm-to-Table: Oregon State Correctional Institution prison farm produces over 20,000 pounds of vegetables in their greenhouse. The produce is divided between the prison food service and donations to food banks. In addition to increasing the availability of fresh healthy vegetables for both prisoners and the local community, the program provides prisoners with hands-on job skills in sustainable agriculture (Bulger, n.d.). The program benefits from a collaboration between Oregon State Correctional Institution and Oregon State University.

Sagebrush in Prisons Project: Not all prison farms grow food. A partnership between the Federal Department of Corrections, the Institute for Applied Ecology and Bureau of Land Management, the project focuses on growing native plants to restore habitats of the greater sage-grouse and surrounding ecosystems, particularly sagebrush. In 2019, the project produced 441,926 sagebrush and 8,200 bitterbrush through activities in nine prisons across five states in the U.S. (Institute for Applied Ecology, n.d.).

Non-profit organizations such as Growing Gardens out of Portland, Oregon have been partnering with correctional institutions and other agencies to offer gardening programs for prisoners that help supply fresh food for the prisons as well as local communities. In 2019, the garden crew produced more than 11,000 lbs of food, donating over 10,000 lbs to four area food banks (Sustainability in Prisons Project, 2019).

Many programs focused on food donation do not allow prisoners to participate in the donation process itself. Programs that do include prisoners, however, offer opportunities for community connection and increase the rehabilitation potential (Timler et al., 2019). The prison garden founded in 2012 at Mission Institution in Mission, BC, demonstrates the impacts of donating food.

On a rotating basis, the men are given escorted temporary absences (ETAs) to deliver food directly to the community (Strijack, 2019). Not only are the men able to draw parallels between food insecurity and their own circumstances, but active participation in the donation process allows them to connect to communities, face to face. It cements their work in the prison garden as meaningful and impactful, and allows them to imagine plans for life outside prison, such as volunteering in the community.

Recommendations for Collins Bay and Joyceville Institutions

There are several different options that can be pursued in terms of food production activities. Certain activities could be up and running within one year (ex. annual mixed vegetables), while others crops require several years of preparation and growth (perennials, fruit and nut trees). We recommend a scaled approach – beginning with mixed vegetables in year 1, with plans to plant fruit and nut trees, along with select perennials in years 2 and 3. We have also suggested several complementary activities (non-food agricultural crops as well as non-crop activities) to explore as part of the prison farm program.

A mixed vegetable production involving the crops outlined in Table 4 would provide CSC with an excellent diversity of vegetables that could easily be incorporated into meals at finishing kitchens, distributed to community food organizations, and in some cases, provided directly to prisoners through the canteen. In selecting possible crops, we have considered nutrient and soil requirements, soil preparation, planting and harvest considerations, as well as post-harvest factors (storage and/or distribution).

Table 4
Suggested crops (annual vegetables) for prison farms

Crop	**Preparation/Planting Considerations**	**Harvest/Storage Considerations**	**Prison Food Services or Community Distribution**
Potatoes	Mechanical planting and hilling Late planting (end of June) to avoid 1st generation Colorado potato beetle	Mechanical harvesting Stores well	Both
Sweet potatoes	Planted from slips	Stores well	Both
Squash	Seedling started inside 4-6 weeks before planting	Stores well	Both
Pumpkins	Seedling started inside 4-6 weeks before planting	Stores well	Both

Sweet Corn	Direct seeded	Mechanical harvesting	Community
Soy beans (fresh pods)	Harvest green pods for edamame	Mechanical harvesting	Both *Also potential to connect to a food processing program (tofu/tempeh)
Garlic	Planted in the fall, mulch recommended	Mechanical harvesting Stores well	Community
Onion	Can be planted from seeds or sets, but seeds must be planted inside 10 weeks before planting in spring	Stores well	Community
Cabbage	Seedlings started inside 4-6 weeks before planting	Stores well	Both
Mixed greens	Recommended for raised beds	Delicate post-harvest	Prison
Tomatoes	Seedling started inside 8 weeks before planting Suitable for greenhouse production	Good option for canning/processing	Both
Peppers	Seedling started inside 8 weeks before planting Suitable for greenhouse production		Both
Carrots	Mechanical weeding possible if spaced appropriately	Mechanical harvesting Stores well	Both
Cucumbers	Seedling started inside 4-6 weeks before planting Field or greenhouse	Good option for processing depending on variety (pickling)	Both

Field crops

Given the size of acreage available, it is reasonable to assume that the prison farm programs will continue to produce several field crops (also referred to as cash crops), on a rotational basis (see below). Corn and soy remain the most widely produced field crops in the region (followed by hay and wheat) (OMAFRA, 2017). Hay may also be a suitable crop for areas with more marginal soil quality (ex. Class 5). Rough production costs for organic corn and soy are estimated at $570.80 for corn and $379.60 for soy per acre (OMAFRA, 2020), numbers that are comparable with estimates for conventional production. CSC may also wish to explore oats or spelt as possible field crops to incorporate, as well as the hay, corn, soy and barley already in production on the prison farms.

Cover crop rotation

Cover crops are crops that increase the nutrients in the soil; they are typically ploughed under and tilled in the fall or spring depending on the crop in question. Incorporating a cover crop rotation into the prison farm production plan is an important element of maintaining and building soil health. They can also be beneficial in pest management and can reduce soil compaction (OMAFRA, 2016a). Common mixtures include: buckwheat, medium red clover and peas, oats and vetch (see https://eorganic.org/node/467). A buckwheat and clover mix can help to break up clay soil and increase available phosphorus in the soil.

Perennials

In addition to common annual vegetables, perennials offer an interesting complement to provide a more diverse array of fruits and vegetables. These crops would be a good fit both for prison food services and for distribution to community food organizations, as most can be eaten raw without added preparation (or with limited preparation). Popular perennial crops include asparagus and berries, as well as fruit and nut trees. Most perennials take several years before they can be harvested, thus we advise planting them as soon as possible in Year 2. In general, perennials require well-drained sites and mulch, and some require trellising or supports. One important consideration is the up-front planting cost of perennials, which is considerably higher than annual vegetables.

Table 5
Suggested crops (perennial fruit and vegetables)

Shrub/Plant	Years to production	Growing considerations
Asparagus	3	-harvest in early spring -approximately $1.10 per plant (depending on quantity) -100 plants per 100 ft row (4 ft spacing between rows)

Raspberries	1-2	-brambles should be trellised -tunnels can be used to extend season -approximately $1.50 per plant (depending on quantity) -100 plants per 100 ft row (8 ft spacing between rows)
Strawberries	1	-plants should be mowed following June harvest -plants should be covered with straw in late fall to protect from frost -approximately $0.25 per plant (depending on quantity) -100 plants per 100 ft row (4 ft spacing between rows)
Haskaps	3-4	-increasing in popularity as an early and extremely hardy berry -similar to blueberry/raspberry cross in terms of taste -harvest in early spring -approximately $7 per plant (depending on quantity) -30 plants per 100 ft row (8 ft spacing between rows)

Fruit and nut trees

Joyceville currently has some older apple trees on the property. These trees are likely quite old and perhaps past their production prime. Planting a new, expanded orchard of predominantly apples, pears and plums would provide an excellent source of fresh fruits for prison food services. For instance, the Philadelphia Prison System established a 200-tree orchard in 2014, with everything from apples to paw paws, figs and peaches. It is worth noting that most of the fruit produced is donated to the community, as "the city is not permitted to sell the produce since the orchards are tended by workers who are getting paid far below the minimum wage" (McKeever, 2016). This is a principle that CSC would be wise to follow as well.

Table 6 lists several trees suitable for a 6a hardiness zone and could easily be served fresh to prisoners or donated to community food organizations. We recommend purchasing 1-year-old bare root trees, to be planted in the spring. Depending on the number of trees purchased and the supplier, cost is approximately $35-50 per tree. Developing an orchard is a medium- to long-term commitment, as it takes several years for the trees to reach fruit-bearing age.

Table 6
Suggested fruit trees

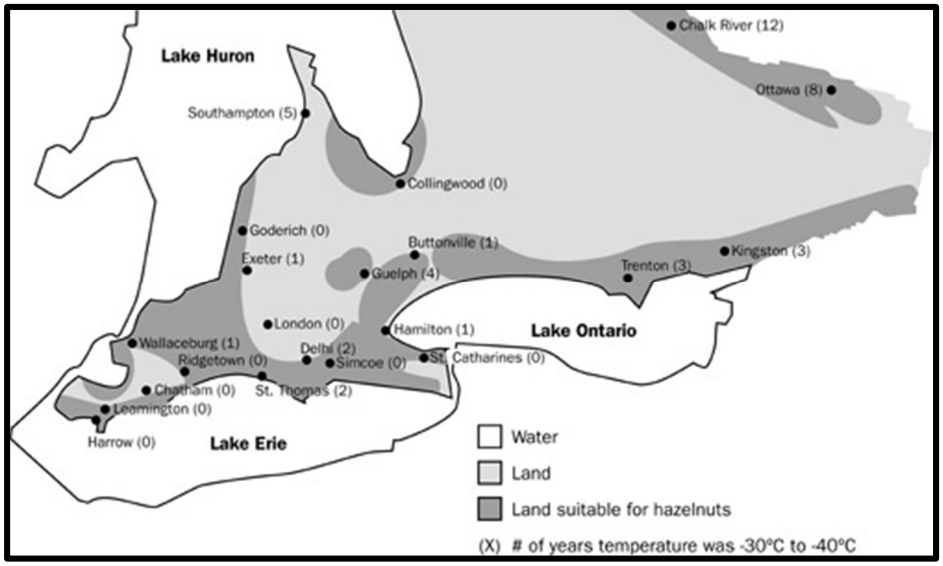
Tree	Years to production	Growing considerations
Apple	3-7	Suggest dwarf or semi-dwarf rootstock able to tolerate heavy soils (ex. B118) Requires pollinator trees Prefers loam soil
Pear	5-7	Full-size rootstock is recommended as it increases frost resilience, Bartlett is the most common in Ontario Requires pollinator trees Prefers loam soil
Plum	5-7	Select varieties with Zone 5 hardiness, such as Frost, Reliance or Harrow Diamond Full-size rootstock is recommended as it increases frost resilience Prefers loam soil

Table 7
Suggested secondary trees

Tree	Years to production	Growing considerations
Hazelnut	4-7	In selecting varieties, disease resistance (particularly Eastern Filbert Blight) and hardiness are two concerns (the Society of Ontario Nut Growers has a list of suggested varieties) Aim for 15% of pollinator trees
Peaches	3-4	Suggest Bailey rootstock, as well as cold hardy "Northern" varieties with good disease tolerance
Maple	30-40	Sugar Maple and Black Maple are the two most dominant varieties in Ontario Grows best in well-drained loam soils, with pH of 5.5-7.5

There is currently a small sugar bush at Joyceville and prisoners have produced maple syrup in the past. However, according to one prisoner, the products of their labour were made available exclusively to prison staff to purchase (Cumming, 2020b). Donating the syrup to local community organizations, or producing maple syrup products that could be served with meals or sold at the canteen for prisoners would represent far better uses, ones that would be line with the Key Principles previously identified, namely tangible benefits for prisoners and the broader community.

Hazelnuts are an emerging market in Ontario, with researchers at both University of Guelph and Queen's University exploring options to expand commercial production in Ontario. OMAFRA suggests planting orchards close to large bodies of water, as the "lake effect" helps to mitigate temperature fluctuations, making both Collins Bay and Joyceville potentially suitable sites. Hazelnuts grow best in loam to sandy-loam soil types however they can also adapt well to clay soils as long as there is sufficient drainage and the pH is above 5 (OMAFRA, 2012). Tile drainage may be something to consider to improve drainage.[17]



While hazelnuts present an interesting market opportunity (Drake, 2015), from the perspective of producing food for prisoners and for community food organizations, they are not a crop that provides many options, as they cannot be easily integrated into food services or food donations. One option would be to use hazelnuts as part of a food processing training program for prisoners, such as turning the hazelnuts into hazelnut butter or a chocolate spread (see Model #2 for a discussion of training and education opportunities).

Peaches are another experimental crop, with growing interest in northern varieties that have up to a Zone 5 hardiness. Researchers at the University of Guelph saw promising results with HW271 and Redhaven varieties (University of Guelph, 2012).

[17] According to the Ontario Agricultural Atlas maps, a portion of the farms are currently tile drained, through there are apparently issues with sediment build-up that is limiting their effectiveness.

Non-food agricultural crops

There are several non-food agricultural crops which could provide a useful complement to food crops. The two most common non-food agricultural crops in Ontario, hemp and tobacco, are not suitable for a prison farm program. However, landscaping and nursery crops (trees, shrubs, flowers) would expand the available training and education opportunities for prisoners, as well as generate supplemental income for the farms – or donations to community non-profit organizations (housing cooperatives or social housing, for instance).

There is also emerging evidence of the environmental benefits of so-called "mini-urban forests," to act as carbon sinks. Also referred to as Miyawaki forests, these dense plantings focus on native tree species and vegetation to create relatively small but highly biodiverse forested areas in urban settings (Nargi, 2019; Thornton, 2020). Complementing the large cultivated field areas of the prison farms with several Miyawaki forests would improve the biodiversity and overall environmental impact of the prison farm program.

Table 8
Native tree and shrub species, Ontario

Evergreens	**Shade trees**
White pine	Red and Pin oak
White cedar	Paper birch
Balsam fir	Red, Sugar and Silver maple
White spruce	Butternut Juglans cinerea
Eastern hemlock	Shagbark hickory
Small trees	**Shrubs**
Serviceberry	Red Osier, Gray or Alternate-Leaf Dogwood
Red mulberry	Gray dogwood
American mountain ash	Honeysuckle Lonicera, Native Bush
Staghorn sumac	Honeysuckles
Nannyberry	Winterberry holly
Redbud	Witch Hazel
ChokeCherry	Ninebark
Eastern Redbud	Elderberry
	ChokeBerry

(Source: Ontario Native Plant Council, 2016; Landscape Ontario, 2013)

Secondary Non-Agricultural Activities

Compost facility

Incorporating a compost facility into the prison farm model would not only reduce institutional expenses (landfill costs), it would also provide a revenue-generating product and a source of high-quality nutrients for the prison farm fields and gardens.

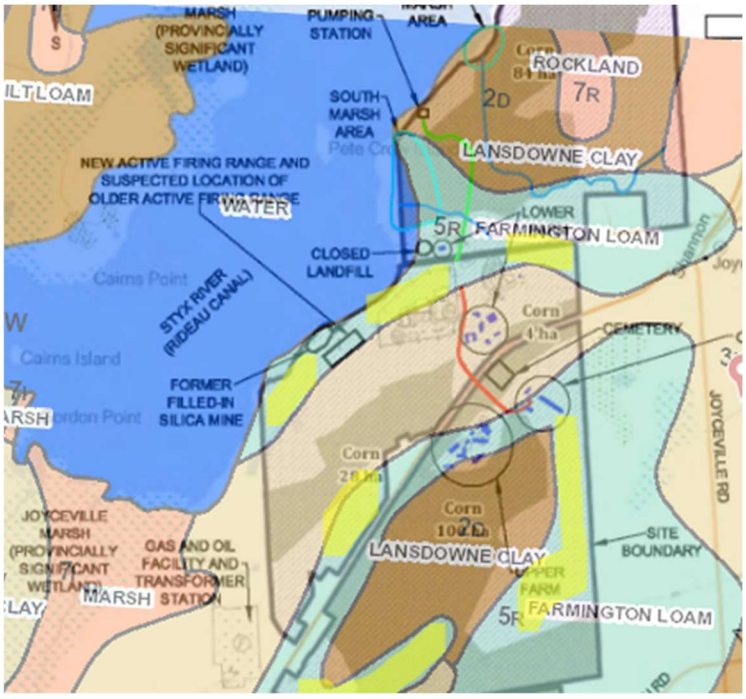
Prior to the closure of the prison farms, Bowden Institution, in Alberta, had a Class II Compost Facility – turning leaves, yard waste, food waste and biosolids into high quality compost (Class A according to the CCME) (CH2M HILL Canada Limited, 2010). The facility used both internally generated green waste as well as materials from grocery stores, including Safeway stores in both Calgary and Edmonton (CSC, 1999). At the time of operation, the composting facility enabled Bowden Institution to reduce its landfill utilization to 0.15 (kg/occupant/day), compared to the national average of 0.6 (kg/occupant/day) (Antler, 2005).

Pittsburgh Institution (now amalgamated with Joyceville) also had a compost facility. In the early 1990s, CSC signed an agreement with the Townships of Kingston and Pittsburgh, the City of Kingston and the Canadian Forces Base Kingston to build the centralized composting facility as a cooperative venture. At the time, the composting facility was considered one of the more advanced technological systems in operation. The finished compost was sold in bulk, however there was interest in developing a sales system of small amounts for the local market (CSC, 1994).

Other prison programs, including the Philadelphia Prison System, have established composting facilities, reducing food waste from the prisons and donating finished compost to the community (McKeever, 2016).

Solar energy production

Solar panels offer another complementary activity to consider incorporating into the program farms. According to the 2016 Agricultural Census, "Ontario had the highest percentage of farms with renewable energy-producing systems on their operation at 10.4%" (Ag Census, 2016). The vast majority of these projects are solar. While wind farms have, at times, been met with community opposition, solar installations have not seen the same levels of concern.



According to the Canada Energy Regulator (2020), most commercial-scale solar projects can expect to save money, as the "breakevens" are lower than the current cost of electricity (meaning the cost to produce solar electricity is less than the cost to purchase electricity from a utility). In Ontario, the commercial breakeven rate is 53% – meaning the cost to produce solar electricity is 53% of the cost to purchase electricity from a utility. This means that not only would solar panels reduce CSC's environmental footprint, it would also lead to cost savings in the long term.

Solar installations should only be considered on marginal lands not suitable for most crops, or on farm buildings. For instance, the Ontario Federation of Agriculture is supportive of small-scale solar projects as long as it does not take valuable farmland out of production (OFA, n.d.). In the case of Joyceville and Collins Bay, there are several areas of Class 5 lands at Joyceville that could be suitable for solar installation (see areas highlighted on the map).

Table 9
Synthesis of agricultural and complementary activities

Activity	**Institution**
Annual vegetables	Both
Perennials	Collins Bay
Fruit and nut trees	Collins Bay
Field/Commodity Crops	Both
Non-food native trees and shrubs	Collins Bay
Composting facility	Joyceville
Solar Panels	Joyceville

Possible stakeholders and collaborators

The Kingston and surrounding areas have a strong and diversified agricultural community. There is ample opportunity to collaborate with area farmers to assist in the planning and development of crop and production plans, or to bring in local farmers as guest instructors or mentors to share their expertise on current best practices with prisoners and CSC staff.

Both the National Farmers Union and the Canadian Federation of Agriculture have active chapters in the area: NFU Local 316 and the Frontenac Federation of Agriculture. In addition, the Kingston Horticultural Society and the Collins Bay & Area Horticultural Society may also be good partners for workshops, instruction, and garden support. In the case of the garden program at Rikers Island in New York (one of the most well-known prison garden programs in North America), their main community collaborator is the Horticultural Society of New York.

OMAFRA could also be a valuable collaborator in developing possible research projects that could be housed with the prison farms, to explore new emerging crops or production techniques. Similarly, the Departments of Environmental Studies and Biology at Queen's University would be natural potential collaborators, as faculty in both departments engage in agricultural and environmental research.

Building partnerships with community food organizations from the get-go is a key component to a successful donations program. There are a range of community food organizations and food banks in the Kingston area that would be suitable partners for food donations. We provide a listing of several of them in Appendix A, noting organizations that provide both food boxes or hampers to those in need, as well as offering free community meals.

Risk management

In implementing a food production model for the prison farms, there are several considerations CSC should be aware of as part of its risk management strategy.

There is an inherent risk and level of unpredictability in any agricultural operation. In the first few years there are likely to be errors and unforeseen consequences that affect production levels. We recommend that CSC keep production estimates conservative, particularly as they pertain to food produced for prison food services. Further, it is important that CSC invest sufficient resources in the necessary infrastructure to support a mixed fruit and vegetable operation. Appropriate wash stations to clean produce and ensure it stays fresh, as well as packing and storage facilities to ensure it is ready for distribution (whether to the prison kitchens or external community food organizations), are key components of a successful farm operation.

As we have highlighted earlier, ensuring the employment experience is valuable and offers fair compensation is an important consideration. Research by Timler (2017) found that the prison garden program in a Mission, BC, prison had difficulty maintaining enough workers to operate the farm. Interviews with the prisoners confirmed that there was a draw to other jobs that were considered less strenuous, paid more and operated year-round (Timler, 2017). Appropriate plans should be made to continue some level of operation during the winter months, whether it be greenhouse work, food storage and processing, or preparation for the upcoming season.

Whenever there are goods entering and leaving prisons there is a concern of possible contraband material. To minimize this risk, we would propose that one community partner be responsible for picking up donated produce at each institution and coordinating distribution with any secondary community partners, so that specific protocols can be developed and maintained. Loving Spoonful and Partners in Mission Food Bank both have experience coordinating pick-up and delivery of donation food, making them natural partners to coordinate distribution from the Joyceville and Collins Bay prison farms.

Partnering with community organizations or food banks who are connected to the local food system, is an important risk management consideration that ensures donated food is being used and consumed. Examples from other community donation programs with prison farms have demonstrated that without a direct connection to a food bank or community partner, food could potentially be given to communities that do not have an immediate need or who do not have the capacity or expertise to make use of it (Timler, 2017).

MODEL #2: HORTICULTURE THERAPY

In addition to producing food for prisoners and the community, CSC should consider the development of a horticultural therapy program. Horticultural therapy is a therapeutic method, in which individuals may alter mental or behavioural difficulties and improve well-being through active or passive involvement in gardening and plant related activities (Khatib & Krasny, 2015). Horticultural therapy programs focus on the development of life skills such as self-care, nutrition, teamwork, and personal responsibility. Therapeutic horticulture can be understood on a continuum, ranging from a formal therapy model with gardening as the primary tool, to less structured rehabilitative programs in which basic gardening activities occur without oversight from a professional therapist. In either case, the cultivation and care of plants is seen as part of a strategy for personal change (Sandel, 2004). Horticultural therapy takes place in relaxing and non-threatening environments such as greenhouses, outdoor garden spaces, kitchens or classrooms (Frisbee, 2018). A horticultural therapy program could become a main adjunctive therapy program available to prisoners at both Joyceville and Collins Bay Institutions.

Establishing therapeutic garden space through horticultural therapy programs can have multiple positive environmental, social and economic impacts. In particular, horticultural therapy programs offer an affordable and accessible tool to improve the mental health and overall well-being of prisoner populations (Jiler, 2006). As CSC is responsible for the healthcare of prisoners, extending partnership models and delivering specialized health services and tailored interventions to support prisoners' mental health and well-being is of utmost importance (Simpson et al., 2013).

Horticultural therapy programs promote prosocial behaviour and social interaction, and can help to reduce violent and aggressive behaviour in prison populations (Jenkins, 2016; Rice & Remy, 1998; Sandel, 2004; Timler et al., 2019). Prison horticultural therapy programs also provide an opportunity for leisure and to participate in a healthy physical release of stress (Khatib & Krasney, 2015). Gardening can also be effective therapy for managing and reducing symptoms of mental illness (Jenkins, 2016), and gardening activities have been found to serve as complementary additions to existing substance abuse interventions (Sandel, 2004). Multiple studies have demonstrated significant reductions in symptoms of mental illness and mental health disorders in prisoner populations upon implementation of horticultural therapy programs (Baybutt & Chemlal, 2016; Cammack et al., 2002; Lindemuth, 2007; Seymour, 2019; Farrier et al., 2019; Linden, 2015). Findings from these studies demonstrate impressive results including decreased signs of anxiety, depression, and stress, as well as improvements in attentional capacity, self-esteem, interpersonal relationships, and social behaviour (Jenkins, 2016). The intention of this proposed program is in line with the Key Principle of providing tangible and direct benefits to prisoners. A horticulture therapy program could provide a unique space and opportunity for prisoners to heal and develop outside of the general milieu of institutional prison culture.

Prisoners experience much higher rates of mental health issues compared to the general population (Sandal, 2004; Simpson et al., 2013); thus, prison programs such as horticulture therapy programs have the potential to improve the mental health and wellbeing of some of the most disadvantaged individuals in society (Baybutt & Chemlal, 2016). Horticulture therapy programs can not only reduce the suffering of prisoners, but can also help to create safer communities by facilitating the development of healthier individuals released into the community.

Horticultural therapy programs also help to engender important life skills necessary for successful community integration. The opportunity for prisoners to care for living things, through gardening initiatives, has been highlighted as a profound and transformative learning opportunity otherwise inaccessible through other rehabilitative programming (Feldbaum et al., 2011). The implementation of horticultural therapy as part of the prison farms at Joyceville, Collins Bay, and other penitentiaries across Canada, would be an investment in prisoners' mental health, and the social condition of the institutions' community as a whole.

The implementation of horticultural therapy gardens may also provide a dual purpose as an interactive outdoor environment to facilitate visitations. Horticultural therapy gardens have been shown to vastly improve visitation experiences from family members of prisoners (Toews, 2020). In a study exploring this relationship, four main themes were highlighted, demonstrating an overall improvement in affective experience, the creation of a home-like environment, the creation of a child-friendly environment, and improved child-parent relationships (Toews, 2020). The quality of visitations is an integral piece in the facilitation of mental health and overall well-being of prisoners and visiting community members alike (Claire & Dixon, 2017).

Horticultural therapy programs are a cost-effective program model, one that could also create financial savings for CSC. Horticultural therapy has been shown to be one of the most cost-effective methods of reducing stress in both staff and prisoners within institutions, by providing a healthy physical release of stress, and a respite from the stresses of indoor institutional living (Feldbaum et al., 2011; Khatib & Krasney, 2015). In a comprehensive report for the U.S. National Institute of Corrections' "Greening of Corrections" initiative, Feldbaum et al. (2011) emphasized that horticultural therapy programs demonstrated better results at lower costs, compared to other therapeutic programs. In a study by Sandel (2004), staff participating in supervision of the prison garden reported lower levels of anxiety and stress in their work and professional lives. This finding demonstrates that the introduction of a horticultural therapy program may lower the potential for burnout in staff members and reduce rates of staff absences and turnover. Furthermore, the findings from multiple empirical studies highlight that recidivism was greatly reduced in prisoner populations that participated in horticultural therapy programs, compared to prisoner populations that did not participate (Khatib & Krasny, 2015; Jenkins, 2016; Timler et al., 2019; Feldbaum et al., 2011). Horticultural therapy programs also require less resources, in terms of land, equipment, consistent labour and food contracts, than agricultural focused prison programs (Reeve, 2013).

Finally, horticultural therapy programs can foster connections that promote a community-based response to crime and improve society's attitudes towards prisoners and formerly incarcerated individuals (Khatib & Krasny, 2015). Many horticultural therapy programs work with various community organizations, bringing in experts and leaders in agriculture to run workshops and facilitate programming. Additionally, produce grown within these programs is often donated to local food banks, and organizations in need (as discussed in the previous model). In this way, horticultural therapy programs can create socio-emotional benefits to both prisoners and the larger community, as well as improve public relations (Timler et al., 2019). Overall, the program would be therapeutic in nature, the horticultural tasks and activities rehabilitative, and the partnerships community-oriented. The goals of this proposed program are to care for and rehabilitate the prison farmland, community-prisoner relations, and most importantly, the prisoners themselves.

Promising practices

In our research we found many promising models of prison-based horticultural therapy programs, both here in Canada and internationally. The following are some key principles and practices of some of the most successful models:

1. Expanded therapeutic care model

The Pacific Institution and Regional Treatment Centre (Matsqui Complex) in Abbotsford, British Columbia runs a successful horticultural therapy program that provides a promising model for both Joyceville and Collins Bay penitentiaries (Frisbee, 2018). At this institution, a trained horticultural therapist oversees the program, and reports on the participants' progress and behaviour to their case workers. Prisoners enroll in the program through referral from the prison therapist. The program has a rehabilitative focus, aimed at improving participants' social and cognitive skills, confidence, self-esteem and motivation (Frisbee, 2018). Rikers' GreenHouse program, on Rikers Island New York, is a very successful and well-known prison agricultural program. In the past few years, this program has shifted to a therapeutic model, overseen by a horticultural therapist and a number of trained instructors (Jiler, 2009). The program now focuses on building life skills such as self-care, nutrition, teamwork and personal responsibility (Jiler, 2006). In both programs, an important part of the therapist's role is to highlight and identify themes and metaphors within the horticultural activities to bring into group and individual counselling with prisoners (Jiler, 2006). These programs expand upon the therapeutic supports currently in place and provide a more comprehensive model of care for prisoners.

2. Community support model

At Mission Institution, in Mission, BC, the garden program grows food for donation to surrounding Indigenous communities that experience food insecurity. Participants in this program emphasized that the community connections they built through the food donations was an important part of their healing journey (Timler et al., 2019). Similarly, the Matsqui Complex horticultural therapy program helps to fill gaps in food services, providing consistent and dependable donations to local food banks in Abbotsford, BC (Frisbee, 2018). Participants reported that the donation of food to the community provided them with a sense of purpose (Frisbee, 2018). Timler highlights how impactful the donation of the garden produce can be for prisoners:

> For some of the men the connections they drew between their food insecure childhoods, their crimes and their incarcerations provided a space for not only reflection, but the ability to develop responsibility and feel hopeful that they could not only change their futures but perhaps impact the chances of children growing up in similar circumstances. That being said, the impact of growing vegetables for donation, including increases in self-esteem, ideas of self-worth and positive identities were not restricted to the men who could personally relate to the experience of economic vulnerability, food insecurity, and hunger. (Timler, 2017, p. 48)

3. Opportunities for traditional cultural practices

Canadian prisons disproportionately imprison Indigenous individuals (Jeffries & Bond, 2012). While this overrepresentation is a larger systemic issue that should be addressed, incorporating

and highlighting Indigenous cultural and healing processes into horticultural therapy programs is one way to make these programs particularly useful and relevant. For instance, Mission Institution and Rikers' GreenHouse program both incorporate Indigenous planting schemes into their gardens (Timler, 2017; Jiler, 2006). The use of the three sisters planting system (of pole beans, corn and squash) and the planting of sacred medicinal herbs such as sage, cedar, sweetgrass and ceremonial tobacco are some examples that could be used in horticultural therapy to incorporate and develop Indigenous practices within the carceral system.

Recommendations for Collins Bay and Joyceville Institutions

A diversified organic mixed vegetable garden is the most promising model for horticultural therapy programs (permanent raised beds and intensive row system, as outlined in the Agricultural Profile section). More intensive, manual production methods are preferred in order to maximize interaction with the plants and garden environment. Organic gardening methods take more patience and intention throughout the growing season than chemical-based gardening. Organic growing will create an increase in prisoners' immediate involvement in the garden's progress, and subsequently the healing benefits of the tasks. The use of organic practices would not only improve the health and well-being of prisoners, prison staff, and the agricultural land, it may bolster CSC's efforts toward building more environmentally sustainable and regenerative programming, as highlighted in the previous section.

Communal growing spaces provide prisoners with an opportunity to build skills around communication and teamwork. This format also provides a straightforward framework of shared responsibility and purpose, as the food produced may be used in the prison kitchens or donated to local food banks. The programs may also propagate plants for prisoners to choose for their cells, as is done at the Matsqui Complex (Frisbee, 2018). The presence of plants in living spaces improves mental health and increases overall well-being (Hall, 2019).

We recommend allocating approximately one acre to the horticultural therapy program. This space would accommodate some large in-ground beds for popular crop production, as well as some raised beds for herbs, medicinal plants and perennials. Ideally, this space would also have open green space, to provide a relaxing, welcoming, open and diverse environment for various activities, gatherings, visitations, and personal reflection. In line with the guiding principle of working towards de-carceral futures, the horticultural therapy program would aim to contribute to a more human environment within the prison setting. The horticultural therapy program could allow prisoners to build a sense of self as part of something greater than, and separate from, the prison institution. Providing a dynamic garden space will be important in order to ensure programming caters to prisoners of all capabilities, regardless of age and capacity. The use of a greenhouse is necessary for early plant propagation, as well as indoor space for programming and preparation during the winter months. We also recommend a gazebo and picnic tables to provide outdoor gathering space for reflective activities, project planning, and visitations.

Drawing on the experience of Pacific Institution/Regional Treatment Centre, we recommend that prisoners at Joyceville and Collins Bay enroll in the horticultural therapy program through referral from the prison therapist (Frisbee, 2018). Based on the success of similar programs, we recommend a maximum 25 participants in the program at a given time. With the proper

infrastructure, such as a classroom and greenhouse, a successful horticultural therapy program could run year-round. Participants may spend two to three hours a day in the garden during the growing seasons, and in relevant workshops and courses during the winter months. Rikers' GreenHouse program has made their program's curriculum available for free online, through the website of the Horticultural Society of New York (www.thehort.org/programs/greenhouse/). This resource may be a helpful starting point in developing programs at both Joyceville and Collins Bay Institutions.

Similar to the horticultural therapy program at the Matsqui Complex, Collins Bay and Joyceville should hire a horticultural therapist to lead the program, or identify a therapist currently employed by CSC, who is willing to lead and participate in the horticultural process (Frisbee, 2018). This program lead would be responsible for overseeing the program and reporting on prisoner progress and behaviour to their respective case workers. The therapist would be required to highlight and identify themes and metaphors within the horticultural activities to bring into group and individual counselling with the prisoners. CSC program staff would supervise and support this program, as they do for any adjunctive therapy program. The appropriate prisoner-to-staff ratio for programming is not available to the public. Current staff requirements should be geared to meet current CSC protocol. Ideally, CSC supervisory staff will be interested and engaged in this programming, in order to advance the effectiveness of the program. As discussed below, many local educators and civil society organizations would be willing to provide workshops and support to develop and maintain this program. Some local organizations, such as the Kingston and Collins Bay & Area Horticultural Associations, may be willing to provide ongoing programming and deliver certification to prisoners upon completion.

Although the goals of a horticulture therapy program are focused on healing, this program could easily be linked to other vocational and educational models (discussed in the next section). Completion of the horticultural therapy program could provide prisoners with certifications or educational credits towards the completion of their high school diploma. Giving prisoners an active role in the program's work planning and food production schedule could provide prisoners with the opportunity to develop business and entrepreneurial skills. A social model of programming may also be complementary to the goals of a horticultural therapy program. Through a social model, gardening programs may be viewed as a leisure activity aimed to improve prisoners' general well-being through recreation. Goals are directed at social benefits for the larger group, community pride, and communication skills. Horticultural therapy programs have been shown to improve the socio-emotional culture of prison institutions, better prepare prisoners for reintegration into civil society, and facilitate the healing of prisoners' psychological and behavioural needs. As a result, horticultural therapy programs strongly complement social and vocational models of institutional programming.

Possible stakeholders

Through the review of successful horticultural therapy programs in prisons, it is clear that strategic partnerships are critical to their success. Even with a horticultural therapist on staff, having outside organizations as partners and collaborators greatly enhances the capacity and sustainability of the program, and enables prisoners to develop connections and relationships with organizations in the community. Partnerships with colleges and universities, non-profit organizations, education and

workforce supports and other civil society organizations, play a large role in the provision of programs, garden projects, and landscaping operations at correctional facilities (Jiler, 2006). These organizations often have the resources necessary for successful programming, as well as the ability to work with at-risk populations. Further, we believe many local farmers, local food advocates, politicians, and socially conscious residents would support the implementation of a horticultural therapy program, and would readily foster beneficial relationships between civil society organizations and prisons given the opportunity.

In the Kingston area, the Addictions and Mental Health Services (AMHS) centre currently runs a horticultural therapy garden and program, and may provide helpful guidance and support in the integration of a program at Joyceville or Collins Bay Institution. The Canadian Horticultural Therapy Association may also be a helpful resource for finding a certified horticultural therapist to manage and oversee horticultural therapy programs. Although it may be beneficial to have a certified and experienced horticultural therapist manage these programs, the Toronto Botanical Gardens offers horticultural therapy certification programs, which could equip therapists currently employed in Kingston penitentiaries with the skills and knowledge necessary to implement and support a horticultural therapy program. Additional organizations that could provide resources, workshops and programming for the implementation of a horticultural therapy program are listed in Appendix A.

Risk management

Although the cost of a horticultural therapy program is minimal, the allocation of secure funding may pose a challenge. As a result, strategic partnerships with other federal institutions and agencies, as well as collaborations with civil society organizations, should be prioritized (Reeve, 2013). In addition to funding, significant institutional support (from the warden and correctional staff) will be necessary in order to integrate horticultural therapy into prison programming and culture. The need for qualified and skilled staff, particularly in the management of horticultural projects, was a key finding within a comprehensive study of 104 horticultural programs in carceral and psychiatric institutions (Grimshaw & King, 2018). It may pose a challenge to find an appropriate number of prison staff willing to engage and participate in the program.

Another challenge, true for any prison farm program, is the off-season, as the Canadian winter provides an average of 150-170 frost-free days per year in the Kingston area (Zone 6a). A number of strategies and suggestions for extending the growing season can be found in the Agricultural Profile of Joyceville and Collins Bay section in this report (see *Season-extension and year-round production*). Beyond season extension strategies, it will be important for a horticultural therapy program to incorporate relevant programming throughout the winter months to engage and support prisoners year-round. Similar to the program curriculum in Rikers Island, winter programming could include the use of herbs from a medicinal and herb garden in the making of products like lotions, lip balms and soap. Greenhouses could be turned into a carpentry shop for making items useful in the garden, or to be donated to schools and parks (Jenkins, 2016). In preparation for the growing season, workshops could be organized with community members or knowledgeable staff on a wide array of agricultural topics such as: integrated pest management, trees and shrubs, garden design examples, maintenance and plant record keeping, soil management, propagations, greenhouse management, botany and more.

MODEL #3: TRAINING AND EDUCATION

The third model we propose is the creation and expansion of relevant agriculture and agri-food training and education opportunities. One of the core mandates of CSC is to provide prisoners with programs that will support their reintegration back into the community and prepare them for release. This includes both employment and employability skills training while incarcerated in federal penitentiaries, and after they are released (CSC, 2018a). Currently, CORCAN's vocational training opportunities offer limited programming related to food, farming and agriculture, but CSC has made reference to program reviews and expansion of programming on the newly reopened farms (CSC, 2019a).[18] The reopening of the prison farms at Joyceville and Collins Bay represents an opportunity to expand vocational training as well as offer more holistic education opportunities for prisoners. CSC has indicated that the Joyceville and Collins Bay farms will be used as a model to assess future employment training programming for other potential prison farm locations. They have also committed to providing prisoners with education programs (prioritizing secondary education) to help them develop literacy, academic, and personal development skills with the goals of enhancing employability and improving their overall capacity to successfully reintegrate into the community (CSC, 2019a). Assuming CSC follows through on these commitments, there is a strong potential to link the prison farms with quality job skill training and educational opportunities as well as connecting community partners to better prepare prisoners for release.

As the demand grows for local food, there is an opportunity for prison farms to provide relevant job training and skill-building that would prepare prisoners to take on diverse roles within agri-food systems and foodways. Through the incorporation of a farm-to-table model, small scale food production operations, and a horticulture program, there is an opportunity to provide quality education and training experiences that are beneficial to the growing local food system. The recommendations below are in line with several of the Key Principles outlined at the outset of this report: namely, tangible benefit to prisoners through meaningful work in safe, fairly compensated conditions, and supporting community reintegration. The practices and skills emphasized in this section also reflect a commitment to environmentally sustainable and regenerative practices.

Outcomes and impact

A prison farm program that incorporates job training, education and employment opportunities can provide benefits to prisoners, as well as the local community and economy. These include:

- Enhanced opportunities for vocational and job skill training in areas related to food processing, horticulture, cooking, gardening, greenhouses, composting and landscaping
- Opportunities for the development of life skills and personal fulfillment
- Hands-on experiential learning opportunities
- Increased connection to community

[18] At one time, CSC offered a *Food Industry and Food Safety Training* program, focused on food safety and culinary skills. However, the most recent reference to its existence is from 2013, and it is unclear whether this program is still being offered (Correctional Service Canada, 2013).

Drawing on a review of promising prison farm models and vocation training programs in Canada and elsewhere, we outline several key potential benefits below.

Post release employment outcomes

Employment is often considered to be critical in helping prisoners successfully transition from prison back to the community. Various studies have shown that having access to educational and job skill training opportunities while incarcerated improves employment rates once released (Duwe, 2017). Research by CSC confirmed that obtaining at least one vocational certificate while incarcerated was associated with higher rates of employment post-release. In particular, participation in work programs is beneficial if it leads to a provincially-recognized trade certificate, if the hours worked can count towards an apprenticeship, or if the work is in a field that matches the future employment aspirations and plans of prisoners (Nogueira Menezes Mourão, 2018).

The link and benefits between vocational training and post-release employment go beyond skills specific to the agricultural sector. Prison farms can also be an important avenue for prisoners who have obtained vocational certificates (tickets) to gain practical experience in their trade. As John Leeman, a formerly incarcerated individual, noted in his testimony to the Standing Committee on Public Safety and National Security:

> Even with the welding tickets that I brought in there from the machine shops, to use when the machines were breaking down, I was never able to utilize the trade I had; I found out while I was in there that a farm boss had to teach me how to re-weld some of the stuff, because welding two plates gets you your ticket, but it doesn't give you the experience... so it's nice that I had the fundamentals, but *I didn't actually get to demonstrate some of these work ethics until I got to the farm.* (Standing Committee on Public Safety and National Security, 2010, emphasis added)

Recidivism

Recidivism is a common measure of correctional program effectiveness (Duwe, 2017). Some research suggests that individuals are less likely to re-enter the prison system when they work more often, and have employment that is stable, satisfying, and perceived as having career potential (Uggen, 1999; Huiras et. al., 2000; Crutchfield & Pitchford, 1997). In research conducted on the reintegration and recidivism of prisoners who participated in GreenHouse or GreenTeam programs at Rikers Island, Laichter (2008) found that these prisoners had lower rates of reconviction, and were more likely to have obtained viable employment opportunities.

Interpersonal and life skills

In addition to positive impacts on post-release employment and recidivism rates, the personal and life skills that can be obtained while participating in prison farms can help support individuals as they transition back into the community, or even while still incarcerated.

The Master Gardener program at HMP Rye Hill Institution in the UK provides a clear example of some of the positive personal outcomes for prisoners. Intentionally designed as an intervention for prisoners with substance abuse challenges, the program goes beyond benefits for addiction recovery and mental health, by offering a space for participants to work together and build a sense

of community. The inclusion of a peer support model also encouraged prisoners to make positive behavioural changes inside and outside the prison. Furthermore, prisoners gave input into the garden design and maintenance, which was important to their sense of ownership and achievement, and served as motivation to engage in the program. Overall, the data revealed how in addition to improvements in health and well-being, participants in the Master Gardener program spoke about feeling a sense of pride, achievement and self-worth (Brown et al., 2015).

Types of training and education

As we have highlighted in the previous two sections, the kinds of programming developed and actually implemented is a crucial factor in determining the overall impact of the prison farms. Not all training and education is necessarily beneficial. Meaningful and relevant training and education opportunities are those that are geared towards particular certifications or career prospects, or that otherwise provide prisoners with a tangible skill that can help them once their sentence is complete. Training and certifications offered should be equivalent to programs offered outside of prison, ensuring that prisoners are receiving the same quality and level of skill development and capacity building. This is not to suggest that all education and training programs need to have a credential associated with them, but that the implementation of these programs requires considerable thought and attention to create programs that provide tangible benefits to prisoners, and by extension, to the overall community.

There is a wide variety of education and job skill training opportunities that could be leveraged to enhance the impact and contributions of the prison farm programs. These include vocational training and instructional programs or courses that focus on the skills required for a particular job function or trade. In Ontario, skilled trades are divided into four sectors: construction, industrial, motive power, and service. Relevant skilled trades related to agriculture and food include chefs and cooks, horticulture technicians, and food production technicians.

Educational degrees typically offered by colleges or universities (diplomas, certificates, bachelor's degrees) can also prepare prisoners for careers in the food and agriculture industry, but focus more on knowledge acquisition and an understanding of the sector. As the demand for local food increases, alongside a growing awareness of the challenges facing our food systems, more universities are developing food systems and food studies programs. St. Lawrence College, Durham College and Ryerson University all have innovative online programs in sustainable food systems which prepare students for careers in non-profit organizations, research centres, community organizations, restaurants, and grocery stores.

There are also numerous programs offered in Ontario that provide life skills and offer opportunities to build on general interest knowledge in gardening and agriculture. Though not considered essential for employment, these programs provide additional experiences and may be useful in a variety of different settings. Examples include Master Gardener and composting certifications.

Appendix B provides a summary of the opportunities available across Ontario. This list, though not exhaustive for all of Ontario, focuses on the Kingston area and online programs. The scope of programs covers vocational certifications, certificates and diplomas, and general interest programs, which are all designed to support holistic experiences for prisoners working on prison farms.

Promising practices

Many of the successful or promising prison farm models identified in our research had built-in opportunities for skill development and job training. Based on our research, the following are common key principles and practices of some of the most successful models:

1. Opportunities for self-direction and ownership

Many prison farm programs, such as HMP Rye Hill Institution (cited above), deliberately incorporate opportunities for prisoners to have direction and take ownership over aspects of the farms or gardens (design, training or food/menu preparation as examples). In Norway, Bastoy Prison offers a unique take on rehabilitation and reintegration. With structured guidance, prisoners make many of their own decisions, such as where they work and what they eat. They operate on the principles of attitude, respect, and self-discovery, and focus on rehabilitation through daily living. Scott and Gillis (2011) point out that it is extremely important to provide prisoners with resources that will increase confidence in their ability and skills, and teach them how to overcome the belief that they are not worthy or capable of something better. A prison farm program that fosters community connections and social integration would also serve to promote a sense of belonging and agency.

2. Peer-to-peer teaching model

Roots of Success, a program out of Washington State penitentiaries, emphasizes job readiness and re-entry skills while teaching prisoners about environmental topics. Graduates of this program become equipped to enter the workforce in the green economy. Classes are taught by prisoners who have been trained by recognized experts in the green economy. Once prisoner-instructors gain sufficient experience in the program, they are candidates for advanced training. These candidates show exceptional teaching and leadership skills and become certified as Master Trainers, which enables them to train and certify more instructors. This has the added benefit of creating a sustainable cycle of instructors for the program.

3. In-prison work placement model

Northeastern Correctional Facility in West Concord Massachusetts is a minimum security and pre-release all-male prison with a unique and highly successful horticulture and farm program – complete with an open-to-the-public restaurant that employs prisoners. This restaurant, called the Fife and Drum, offers culinary training for prisoners and is run and overseen by a trained instructor. Prisoners apply to the program where they can work as the cooks, bakers, servers, or dishwashers.

In the UK, many prisons are providing opportunities to work in retail farm shops which sell vegetables, herbs and fruits. Similar to Northeastern Correctional Facility, the goal is to give relevant and meaningful work experience to prisoners who are in low security and pre-release prisons. The prisons either partner with local shops or sell produce grown onsite at the prison and work in partnership with local organizations (Don, 2019).

4. Bridged training and work placement program models

Programs affiliated with the Cook County Jail in Chicago offer three programs: an agriculture program inside the Cook County Boot Camp that instructs prisoners in basic gardening and composting; a transitional jobs program that works with former prisoners in horticultural and agricultural job training; and a nine-month certificate program that provides adults with a comprehensive sustainable urban agriculture and horticulture education through a partnership with Chicago City College. This model works in close partnership with Cook County Jail and Chicago Botanic Garden's Windy City Harvest program (Roots of Success, 2012).

Through their GreenHouse and GreenTeam programming, Rikers Island bridges in-prison programming with employment opportunities. The GreenTeam is a post-release internship program that provides formerly incarcerated GreenHouse participants with employment immediately upon release (The Horticultural Society of New York, 2020).

Recommendations for Joyceville and Collins Bay

In addition to the food production and horticultural therapy models outlined in this report, complementary training and education opportunities should be implemented to support prisoners in developing employability and general life skills as well as specific training and certifications relevant to the growing agri-food sectors. Our recommendations build on some of the programming that has already been implemented and some of the current employment training offerings, as referenced above.

Prison farm programs provide a unique opportunity to establish a farm-to-table approach, with education and training offerings that incorporate agriculture, culinary, and food processing sectors. Building a model that includes educational opportunities, job skills training, and post-release services can support prisoners holistically as they transition back to the community.

Foundational to a model that holistically supports re-entry into the community are education and employment training certifications. Kingston-based Queen's University and St. Lawrence College currently offer programming that would be supportive to the objectives outlined in this report. It would also be beneficial to explore online education and certifications as this offers more opportunity and the chance to partner with other institutions which may be able to enhance offerings.

The Walls to Bridges (W2B) project is an educational program that brings together incarcerated and non-incarcerated students to study post-secondary courses in prisons across Canada. Courses are offered through universities or colleges and taught in correctional settings. Students who are incarcerated study together with students enrolled in university/college programs (Walls to Bridges, 2020). CSC has indicated an interest in expanding partnerships with W2B to offer more post-secondary educational opportunities. An expanded partnership would support universities and professors, and create a wider variety of options for course offerings and educational experiences.

On the foundations of education and certification, job skill training equips prisoners with experience that can be credible and transferrable. Training and skills in the culinary arts,

agriculture or horticulture (combined with relevant certifications), opens up a wide variety of careers in the agri-food industry. These include chefs, landscape gardeners, horticultural technicians, agricultural technicians, all of which are certified trades in Ontario.

Community-based programs can also be an important part of the reintegration process and add benefits beyond employment such as personal fulfillment. For example, the Cook County Jail outside of Chicago offered a Master Gardener's Certificate, in partnership with University of Illinois. Using a 10,000 square foot garden, the program awarded 36 certificates to prisoners who completed the program in 2009. The food produced by the prisoners is donated to local food banks (Walker, 2009).

The table below outlines potential opportunities for education and employment training, with recommendations for each institution. These recommendations are based on programming and infrastructure that already exists at each site. In the Kingston area, Queen's University and St. Lawrence College could be potential partners in education and vocational training. To offer further opportunities, particularly those relating to sustainable food systems, remote learning courses are available with other institutions. St. Lawrence College offers an online certificate in Local Sustainable Food and has programs in business and landscape management.

Table 10
Education and training recommendations for Joyceville and Collins Bay

Focus	**Course or Certification**
Employment-geared Training and Certifications	• Certified Horticultural Technician (Durham College) • Social Entrepreneurship certificate (Humber College) • Landscape Gardener (St. Lawrence College) **Joyceville only* • Recipe for Success (Small Scale Food Processor Association) **Joyceville only*
Continuing Education Certifications or Programs	• Sustainable Local Food Certificate (St. Lawrence College) • Food and Farming Certificate (Durham College) • Certificate in Food Security (Ryerson University) • Certificate in Urban Agriculture (Ryerson University)
Community-based and/or Professional Education Programs	• Master Gardener (University of Guelph/ Dalhousie University) • Composting with "Bugs" Program **Joyceville only* • Compost Operations Training **Joyceville only*

As referenced above, specific job skill training and experience is considered highly valuable for prisoners (Duwe, 2017). Given the existing infrastructure already in place at Joyceville Institution, emphasis on small scale food processing would be appropriate. The land at Collins Bay has a stronger profile and already had one field identified for organic farming, thus larger agricultural production would be suitable there. Cooking/culinary training and experience in the kitchens at each institution would also be feasible if the appropriate infrastructure was in place.

As partnerships are built with the recommended colleges and universities, care should be taken by CSC to incorporate employment and education support services for prisoners. Support such as résumé and interview skills, computer skills and general literacy will be important for prisoners as they prepare for employment or enter the classroom as a student. Finally, partnering with local organizations to support employment opportunities in the community for those recently released or in a pre-release phase, would offer some stability and further opportunity to gain meaningful employment. Community organizations listed in Appendix A are already integrated into Kingston's local food system and could be approached for employment opportunities for prisoners upon release.

By establishing key partnerships with post-secondary institutions and local community organizations, the prison farms can provide prisoners with relevant and rewarding job-training, education and skill-building programs that will improve the social and economic outcomes for prisoners, and help CSC fulfil its mandate of ensuring both the rehabilitation and reintegration of prisoners in their care.

Risk management

In the CSC report, *Offender Perceptions on the Value of Employment*, Scott and Gillis (2011) identify a number of barriers for prisoners who are seeking employment. These include intrapersonal (physical/psychological health, substance use/abuse, education/skills, poor work history and a lack of qualifications), subsistence (finance, housing, poverty/debt) and support conditions (e.g., a lack of social support), employer attitudes or discrimination, as well as legal barriers or formal restrictions for certain professions. While many of these are broader structural issues, these barriers are nonetheless important to consider upfront when designing programming and seeking out appropriate supports or partners.

Community partnerships were central to the success of many of the models cited above. Whether seeking out partnerships with local horticultural societies, post-secondary educational institutions, or non-profit community organizations, they come with some specific considerations for the participating prisoners as well as for the institution.

Many programs geared towards incarcerated individuals accept small numbers into the program and thus any corresponding training or education must take this into account when planning for instructors, supervision and proposed work outputs. Considerations for staff security clearance (particularly for outside instructors and contractors) must be taken into account as well as any succession planning for these types of staff. Incorporating peer-to-peer training and instruction can help alleviate any pressures with succession.

Limited educational background is one of the most prominent factors that prisoners face when looking for employment upon release (Scott & Gillis, 2011), and thus ensuring that prisoners have the necessary support is an important element of program success. A CSC evaluation on their Education Programs and Services (CSC, 2015) reported that across many federal institutions, the library and computer resources were limited. With many courses being offered online and students using various software for studying and assignments, investing in upgrades and services will support prisoners through their educational journeys. Burke (2019) highlights some of the possible solutions for prisons with higher security controls, including "lockdown browsers" that allow specific access to sites for online learning. Support from university/college partners will be needed to ensure appropriate books and resources are supplied for prisoners to access. It would also be beneficial to provide basic literacy and computer courses, and résumé building and interview support to prisoners enrolled in educational programs, to further their success while incarcerated and post-release.

Ensuring the legitimacy of any work skills gained through prison farms is important to facilitating future opportunities. Incoming instructors and supervisors should have credible experience in the field. Additionally, any credentials earned while in prison should be transferable to other campuses within the university/college so a prisoner may continue or upgrade once released.

The costs associated with providing educational opportunities are relatively low, particularly compared to costs of reincarceration (CSC, 2015). As we have outlined above, education and job skill training contribute to positive post-release outcomes such as employment and reduced recidivism. CSC calculated (using RAND methodology) that the average cost per participant for an education program is $2,950 compared to the average cost of reincarceration which was $241,407 over a 2-year period (CSC, 2015). To effectively implement the proposed recommendations, cost considerations include:

- Upgraded resources: computers, books (to be available at prison libraries)
- Lab materials: culinary and/or food processing equipment for training
- Instruction: part-time course instructors
- Staff allocation: dedicated CSC staff to support education initiatives and prisoners working through programs, and to liaise with partnering schools and organizations

Any combination of the three distinct but interrelated alternative models outlined above for CSC's prison farms would be considerably better for the prisoners, corrections staff, CSC, and the broader community, than the proposed dairy goat agribusiness.

CONCLUSION

This in-depth review of the Correctional Service of Canada's current plan for the prison farms determines that it will provide little in the way of benefits to prisoners, CSC, or the broader community. In fact, as the evidence demonstrates, it is much more likely that an industrial goat operation will cause harm on a variety of fronts. This does not need to spell the end of prison farms in Canada, as we have outlined alternative approaches to prison farms that offer a much more promising way forward. These alternative proposals are feasible, innovative and effective. The analysis presented throughout this report is based on a review of the academic literature and current evidence, as well as promising practices drawn from existing prison farm programs in Canada, the United States and Europe.

As detailed in Part One of this report, we foresee numerous problems with CSC's proposed prison farm program, which will be composed primarily of an industrial-scale goat dairy. This report has focused on three levels of consideration – the prisoners, the institution and CSC, and the broader community. First and foremost, there is no empirical evidence to suggest that CSC's proposed farm program will meet the stated objectives of the program for participating prisoners, i.e. providing vocational skills that make employment post-release more likely (and recidivism less likely by extension), as well as having rehabilitative and therapeutic impacts. In contrast, there are empirically documented reasons (detailed herein) to conclude that the program will not only run into problems actualizing the stated goals, but could also contravene prisoners' human rights.

Second, the externalities produced by industrial livestock operations have been well documented in the literature. There is reason to believe that the presence of livestock animals in the numbers that have been proposed could have deleterious effects on the participating prisoners, as well as on other prisoners and staff in the institutions where the prison farms are sited. These externalities include the transmission of illnesses, and decreased air quality. There are also a number of uncertainties regarding how the institutions (and CSC more generally) plan to deal with the concomitant complications of the dairy industry, including manure (which comes with its own associated risks), the risk of serious communicable diseases (e.g., scrapie) in the herd, and the excess kids that are produced by the need to annually impregnate the goats to ensure milk production.

Finally, there are potential impacts on the broader community. Based on a number of studies documenting decreased property values surrounding intensive livestock operations, due largely to concerns and realities regarding noise, air quality, water quality, and odours, it is possible that homes in the areas surrounding the institutions where these farms will be sited will be negatively impacted. A second potential economic impact could be felt by others in the goat dairy industry. Evidence provided in this report suggests that the size of the goat dairy that CSC is proposing could make it the largest goat dairy in Ontario, and possibly even in Canada.

CSC may have thought that a prison goat dairy operation would be less objectionable than a meat-producing livestock operation or less problematic than a cattle dairy operation faced with Canadian quota controls. Or perhaps a few years ago they saw an opening in the market with the arrival of the Chinese infant formula processing facility in Kingston, Ontario. Regardless of their motivation

for centering their farm program on a goat dairy, it is clear that the scale will be immense. This will not be a setting where prisoners are able to gain useful vocational skills or engage in meaningful and therapeutic interactions with animals – this will be an intensive livestock operation that brings with it all of the externalities and risks of other intensive livestock operations, without evidence to support CSC's claims regarding benefits for participating prisoners.

On any scale, animal agriculture requires numerous practices (including slaughter) which are inconsistent with every recognized animal therapy model, including CSC's own guidelines for incorporating animals in prison programs. Considering the potential for abuse (recognized by CSC in its guidelines), the heightened risks posed by the COVID-19 pandemic, the difficulties associated with any form of animal management, as well as CSC's lack of transparency surrounding the unexplained deaths of numerous animals already in its care, this report concludes that the prison farms should not involve animals in any capacity.

In response to these conclusions, the second half of this report outlines three distinct but interrelated alternative program models: re-orienting them towards organic fruit and vegetable production for prisons and community organizations; horticulture therapy; and agri-food education and training. We believe that these models represent the most promising and effective path forward for the prison farms, balancing benefits for prisoners and advancing CSC's overall objectives, alongside positive contributions to the broader community and the environment. We have recommended modest proposals that offer CSC a starting point, with additional activities that could be incorporated over time. Further, we have provided specific recommendations for Joyceville and Collins Bay Institutions, to illustrate what first steps CSC could take to shift course towards a more just, sustainable and effective prison farm program. Each program model offers its own specific benefits, as well as minimal risks that must be carefully evaluated by CSC. It should be noted that a more detailed cost analysis would need to be conducted, as many specifics of the previous and current prison farm activities have not been released to the public.

Re-opening the prison farms is a historic opportunity for CSC to establish itself as a leader in innovative rehabilitation and reintegration programing, based on active community collaboration and environmental stewardship. This will require an openness on behalf of CSC leadership to explore new ideas and implement new approaches. However, the long-term impacts of transforming Canada's prison farms have the potential to be deep and far-reaching.

Transforming Canada's prison farms will not solve the totality of problems endemic to the prison system, but it would constitute a step in the right direction.

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APPENDIX A

Possible Community Partners and Collaborators

Agriculture and Gardens – Production and Education

The Canadian Organic Growers, Growing Eastern Ontario Organically (GEO-O)

Kingston Horticultural Society (https://kingstonhort.ca/)

Collins Bay & Area Horticultural Society (http://www.collinsbayhorticulturalclub.com/)

NFU Local 316 (https://nfuontario.ca/new/locals/local-316/)

Frontenac Federation of Agriculture (https://ofa.on.ca/federations/frontenac/)

Community Food Donations

Loving Spoonful (https://www.lovingspoonful.org/) already has an existing collaboration with CSC, having received donations of produce from some of the prisoners' gardens.

Partners in Mission Food Bank (https://www.kingstonfoodbank.ca/). This is the central food bank for the Kingston area.

The Food Sharing Project (http://www.foodsharingproject.org/) is an initiative of the Kingston-area school boards, along with several community groups and businesses to provide healthy meals to students in need.

Martha's Table (http://www.marthastable.ca/) provides daily free hot meals for those in need, seven days a week.

St. George's Cathedral runs a free meal program, LUNCH by George (http://www.stgeorgescathedral.ca/index.cfm/outreach/lunch-by-george-a-drop-in-program/)

St Vincent de Paul Society (http://www.svdpkingston.com/) offers several free meals.

The Salvation Army runs the Rideau Heights Emergency Food Bank and the Break of Life Club.

Good Food Box Kingston and Good Food Stand - two non-profit initiatives providing affordable fresh fruit and vegetables to Kingston residents.

Horticultural Therapy and Social Supports

Kingston Addictions and Mental Health Services (AMHS) Centre (https://www.amhs-kfla.ca)

Canadian Horticultural Therapy Association (https://www.chta.ca/)

Collins Bay & Area Horticultural Society (http://www.collinsbayhorticulturalclub.com/)

Kingston Horticultural Society (https://kingstonhort.ca/)

KEYS Job Centre (https://keys.ca/)

John Howard Society of Canada (https://johnhoward.ca/)

APPENDIX B

Potential Training & Education Opportunities

Vocational Training

These programs provide individuals with essential job training skills and are offered by accredited universities and colleges in Ontario.

St. Lawrence College

Sustainable Local Food Certificate (online, part time)
This certificate program teaches the practices, principles and philosophies involved in local food system development. The focus is on increasing both academic and hands-on knowledge of regional food initiatives across Canada, alongside international best practices. There is a specific concentration on applied learning, online networking, and community research. It is designed for those working, or hoping to work directly in local food system development or who want to learn more about this area. Courses cover topics such as: food system trends and policies, sustainable farming principles, local food businesses, food justice and urban agriculture.
https://www.stlawrencecollege.ca/programs/sustainable-local-food/online-part-time/online

Culinary Skills Training (1-year program)
This is a certificate level program that provides individuals with the skills and training needed to achieve entry level positions in the professional culinary industry. Students learn the entry level aspects of food production through demonstrations by culinary professionals, followed by hands-on practice. Courses will cover basic nutrition, kitchen management and fundamental food and labour controls.
https://www.stlawrencecollege.ca/programs-and-courses/full-time/programs/a_m/culinary-skills-chef-training/kingston/

Culinary management (2-year program)
This is a diploma level program that provides individuals with the skills and training needed to achieve higher levels of employment in the professional culinary industry. The program will include all of the necessary foundational skills including courses in Culinary Techniques, Vegetarian and International Cookery and Bakery Skills. Culinary Management students will also study business communications, management practices, nutrition, menu planning and development and applied computer skills.
https://www.stlawrencecollege.ca/programs-and-courses/full-time/programs/a_m/culinary-management/kingston/

Landscape Gardener (1-year program)
This program gives students a strong foundational knowledge about hundreds of common plants grown in Canada, soil and plant physiology, and garden design and maintenance. This program is

designed for the home gardener and persons interested in finding employment with nurseries, garden centers or as landscape contractors.
Source: https://www.stlawrencecollege.ca/programs-and-courses/full-time/programs/a_m/landscape-gardener/kingston-part-time/

Continuing Education

These programs and courses can help prisoners continue to develop knowledge and skills specific to farming, food and sustainability.

Durham College

Food and Farming Program (online, 4 semesters)
Guided by a field-to-fork philosophy, this program prepares individuals to be leaders in the rapidly evolving food sector. Students in this program will learn how to create wholesome, locally produced, farm-fresh food. The program will also bring about enhanced awareness of local food production. There are field placement opportunities (work on farms, greenhouses etc.) and a final project that requires the development of a value-added food product. Incoming students are required to have an Ontario Secondary School Diploma, Grade 12 English and Grade 11 math.
https://durhamcollege.ca/programs/food-and-farming

Ryerson University

Certificate in Food Security (online, 4 courses)
A fully online program that explores food-related health and education issues, food policy, environmental sustainability, human rights, and alleviation of food insecurity. Students will gain an understanding of food security, be able to plan and undertake assessment of household and community food security, apply economic thinking to strengthening food security and learn how to initiate the development of food policy and programs. They will also gain an understanding of urban food security and initiatives to strengthen urban food systems. Required is an undergraduate degree or 5 years experience with food security work, or a 3 year baccalaureate.
https://continuing.ryerson.ca/public/category/courseCategoryCertificateProfile.do?method=load&certificateId=194754

Certificate in Urban Agriculture (online, 4 courses)
This course equips individuals with the knowledge, skills, and practical experience to address food system challenges in local and global contexts. Students will learn different types of urban agriculture, as well as explore policy and governance issues for strengthening the sustainability and resilience of urban communities and healthy, livable food-growing cities of the future. Mature students with experience or an Ontario Secondary School Diploma (OSSD) with six Grade 12 U or M credits (including English) is required for admissions.
https://continuing.ryerson.ca/public/category/courseCategoryCertificateProfile.do?method=load&certificateId=3820596

Coursera

Coursera is an online learning platform that offers open-source online courses, specializations, degrees and professional certifications. They collaborate with universities and companies to deliver the courses and are often delivered free for anyone to register. Highlighted below are some general interest courses in food systems that are offered via Coursera.

- Unravelling solutions for Future Food problems - Utrecht University
- Agriculture, Economics and Nature - University of Western Australia
- Social Entrepreneurship Specialization - Copenhagen Business School
- Small Scale Food Processor Association

Small Scale Food Processor Association

Recipe for Success (online)
From planning through pricing, "Recipe for Success" offers both prospective and current food processors the tools to build a strong foundation on which to grow a successful business, and provides them opportunity to move into retail with greater confidence. The course offers free modules that covers the full scope of the food processing process. Courses include business planning, understanding the market, food processing and regulations, product development, labelling and packaging, distribution and pricing.
https://www.ssfpa.net/index.php?option=com_content&view=article&id=124&Itemid=91

HACCP Training (online)

The SSFPA offers education and funding to food processors to implement food safety systems based on Good Manufacturing Practices and HACCP through the Food Safety Systems Implementation Program.

In partnership with the Small Scale Food Processor Association, Intrisk offers online courses in HACCP. It takes up to 16 hours to complete the course and costs $400. The online course meets Canadian National Occupational Standards for Food Processing Workers.
http://www.intrisktraining.com/index.php?p=2

Compost Operator Training

The Ontario Chapter of the Solid Waste Association of North America, in partnership with the Compost Council of Canadian, has developed a three-day training on Compost Facility Operating Practices. Should CSC decide to re-start the compost facility located at Collins Bay, this would be an excellent training to offer to prisoners to involve them in the operations of the compost facility and help prepare them for a career in this sector.
https://swanaontario.org/training/compost-facility-operations/

Supportive Employment Training Programs

St. Lawrence College

Business Diploma (2 years)
This program provides fundamentals in business and allows students to specialize in one area in their second year. It provides strong foundations in marketing, human resources and accounting but also offers courses in entrepreneurship, leadership and project management. Required for admissions is an Ontario Secondary School Diploma (OSSD) with the majority of Grade 11 and Grade 12 courses at the C, U or M level (including English and Math).
https://www.stlawrencecollege.ca/programs-and-courses/full-time/programs/a_m/business/kingston/

Queen's University

Graduate Diploma, Business (4 months)
The Graduate Diploma in Business program is designed for recent undergraduates from any university and any discipline. The program provides foundations in business and is delivered over the summer months (May-August). It is delivered via remote learning.
https://smith.queensu.ca/grad_studies/diploma_in_business/index.php

Humber College

Social Entrepreneurship certificate (online, 6 courses)
In this program students will learn how social entrepreneurs have developed innovative and profitable solutions to social problems. The aim of the program is to expose students to the concepts of social entrepreneurship and social enterprise and how these are transforming communities and society at large. Taking courses in business writing, ethics, economics and entrepreneurship, students will learn how to build a venture plan for a social enterprise and how to apply basic business knowledge and practice.
https://liberalarts.humber.ca/programs/social-entrepreneurship.html

Life Skills & General Interest Programming

Master Gardener Certification

A Master Gardener is a trained volunteer who provides free reliable horticultural advice to home gardeners. Master Gardeners must pass an entrance exam demonstrating basic garden knowledge. As a master gardener-in-training, you then have three years in which to complete a series of required horticultural correspondence courses. To complete the educational component for certification, you can either complete online study through Dalhousie University, University of Guelph, or by Certification Examination. Master Gardeners in Training (MGiT) must successfully complete an educational component and also complete the required annual volunteer hours before

they become certified as Master Gardeners. Individuals who have recently completed a diploma or degree in horticulture or comparable education, have experience in the industry or extensive horticultural knowledge, you may choose to write the Certification Exam.
https://www.mgoi.ca/education/education.html

Composting with "Bugs" Program / Tilth Alliance Master Composter Program

The Composting with "Bugs" program is housed by the Washington State Reformatory Unit (WSRU) at Monroe Correctional Complex. The program worked with Seattle's Tilth Alliance to create formal education and certification for technicians in prisons. Programming was built off an already established model by the Tilth Alliance that runs a Master Composter/Sustainability Steward Program for city residents. The Master Composter/Sustainability Stewards course is a five week, nine session volunteer training program with a community outreach component. The training course covers topics such as: improving soil health; understanding the small scale composting process; preventing waste, sorting compostables; managing stormwater and teaching others about composting and conservation practices.
http://sustainabilityinprisons.org/spp-programs-in-wa/conservation/composting-w-bugs/
http://www.tilthalliance.org/learn/mcss/mcsstraining

Zero Waste Canada

Training Programs (online)
Zero Waste Canada offers training programs for individuals and organizations and provides foundations of zero waste practices, policies and concepts. There are various online courses that are geared towards those working in facilities or out in the community.
https://zerowastecanada.ca/education-training/

ABOUT THE AUTHORS

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