

Chapter 10

Seed Libraries in the United States

Regulations, Seed Saving, Seed Sharing, and Seed Sovereignty

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INTRODUCTION

Seeds are the carriers of genetic diversity and express agro-ecological traits that vary over time and space, as the product of evolution or human manipulation (Conner 2015, 17–18). Historically, seed saving and sharing have contributed to the domestication of agriculture, advancing food security, human culture, local food economies, and biodiversity (Musser 2014, 14). Moreover, seed propagation and breeding in the hands of farmers (and gardeners) have helped agro-ecological adaptations and built resilience within agri-food systems (Nabhan 2013, 174–175). Unfortunately, globally, 75 percent of edible plant varieties have been lost in the last century, paralleling the industrial, green, and biotech revolutions (Seed Savers Exchange 2020). The loss of adaptable seed varieties and agricultural biodiversity poses a threat to human welfare. Moreover, crop uniformity, due to the consolidation¹ of seed markets and genetic homogenization² (Soleri 2018, 332), exacerbates risks from pests, disease, and climate change (Atalan-Helicke 2015, 641).

There are several factors that contribute to agricultural biodiversity loss, including the industrialization of agriculture, aging of farmers, reduction of farming population, cash crop cultivation, globalization of agribusiness, homogenization of global diets, and competition from hybrid and genetically engineered seeds (Atalan-Helicke 2015, 637). Technological advances and legislative factors that promote commercialization and privatization of seeds favor the interests of big business and disincentivize farmers' participation in

plant breeding (Atalan-Helicke and Mansfield 2012, 136–138; Kloppenburg 2010, 368). The regulatory environment may also restrict the rights of farmers to grow, save, and exchange open-pollinated seeds³ (Dove 2016, 24).

In response to these problems, a movement of community seed projects has developed globally. Community seed projects have existed in the United States since the 1970s as a reaction to the passage of the Plant Variety Protection (PVP) Act of 1970, giving plant breeders exclusive control over new, distinct, uniform, and stable sexually reproduced plant varieties (Ramsey 2018, 201). In the United States, there has been a notable surge in this movement since the 2000s that incorporates initiatives to maintain and improve open-pollinated varieties (Atalan-Helicke 2015, 637). Developed amid concerns about food security and farmers' rights, these initiatives connect to the alternative food movement (AFM) in terms of resisting and challenging corporate control and consolidation by localization (Soleri 2018, 332). Additionally, they aim to address long-term and more recent policy and fiscal trends related to scientific plant breeding. The purpose of this chapter is to examine the work of seed libraries in the United States and the extent to which they contribute to building sustainable food systems.

As of June 2020, there are about 1,400 self-identified seed libraries in the United States (Seed Libraries 2020). Seed libraries facilitate democratic and semiformal seed collection and distribution systems. They have grown significantly in number since the opening of the first seed library at California in 2000.⁴ While the work of seed libraries represents a renewed interest in community seed stewardship, increased local food access, and resiliency (Musser 2014, 15), it has also revealed tensions surrounding regulations and policies on seeds. An incident in 2014, when a Pennsylvania seed library was closed by the state's Department of Agriculture (DOA) for violating the state's seed law, has raised questions about the "legal grey area" in which seed libraries operate (Ramsey 2018, 201). This incident sparked a conversation about existing federal and state legislation on commercial seeds. It also led seed library activists to craft new laws to protect noncommercial seed exchanges from burdensome policy requirements (Soleri 2018, 332).

Seed libraries (and the movement) are an understudied phenomenon in the American food system. While there is growing attention to the seed libraries in public media (Wang 2010; Shea 2014; Sproul 2017), there is a gap in the literature regarding the policy framework in the United States, and how that intersects with the work of seed libraries. Librarians embrace seed libraries as "an innovative mechanism" to serve the community challenges around food, poverty, health, and sustainability (Peekhaus 2018, 273). Others argue that seed libraries hold the promise of restoring seed sovereignty and provide broader access to regionally adaptable seeds for building resilience (Dove 2016, 46; Soleri 2018, 332). Seed libraries also work to protect local

knowledge and the rare and heirloom seeds⁵ that may not be maintained or distributed commercially (Musser 2014, 15).

Our research examined the priorities and concerns of seed libraries in the United States, tensions related to access to seeds, and the policy frameworks that at times challenge the work of seed libraries. This qualitative research employed online surveys and semistructured interviews to better understand: (1) The major concerns of farmers, activists, and seed savers within the seed library movement in the United States; (2) The goals of seed libraries and through what means they are accomplished; and (3) The extent to which seed library effectiveness can be explained. Through archival analysis, we additionally documented the legal and policy framework of six U.S. states (California, Colorado, Massachusetts, New York, Virginia, and Wisconsin), and argue that while the uncertain and challenging legal environment renders seed libraries an underused component in the AFM (Ramsey 2018, 217), seed library expansion nationwide, and their attempts at institutionalization and networking, have increased their significance for access to seeds and resilience of the American agri-food systems. The changes in state policies also raise interesting questions about policy diffusion, and the potential role of state legislatures in shaping and managing relations and transactions related to seeds across the United States.

LITERATURE REVIEW

Governance of Seeds and U.S. Legal Landscape

While the Patent Office Division of Agriculture existed in the United States since the 1850s, broader application of patents expanded in the twentieth century with the development of more sophisticated and scientific techniques in plant breeding. By the 1900s, seed saving, exchange, and cultivation practices of farmers started to change with the establishment of seed certification programs in the United States. These focused on improving seed quality and yields, particularly, through the development of hybrid seeds and publicly funded seed breeding programs. In the United States (during the late 1920s and early 1930s), this led to greater private sector interest in seed breeding (Kloppenborg 2005, 12). The use of hybrid seeds and modern cultivars expanded rapidly after the 1940s, during the green revolution, a technological and agricultural paradigm shift that coupled modern cultivars, often hybrid seeds, with agricultural chemicals, expanded irrigation models, and modern machinery (Kloppenborg 2005, 6).

There are different mechanisms at the global scale that regulate the use of commercial seed varieties for breeding. One of them is the PVP that provides breeders exclusive rights to propagate and sell the protected variety and

derivatives. PVP was established in the 1961 International Convention for the Protection of New Varieties of Plants (the Convention), and it became effective in the United States in 1970 with the PVP Act. For a variety to be protected, eligibility criteria include distinctness, uniformity, stability, and novelty, a set of criteria that generally excluded traditional, farmer-saved seeds (Atalan-Helicke and Mansfield 2012, 134). With the PVP Act, the federal government set the broad parameters, and provided plant breeders control over new varieties for twenty years, and tree/vine varieties for twenty-five years (U.S. Department of Agriculture 2013).

In the United States, despite some exemptions, the 1970 PVP Act imposed limitations on farmers' rights to save and exchange seed, while the seed industry's consolidation spawned seed sovereignty advocacy across different states: Civil society initiatives in the United States such as Seed Savers Exchange and Native Seeds/SEARCH emerged in mid-1970s and early 1980s, reflecting the concerns of gardeners, communities, food activists, and scientists about disappearing diversity and seeds, as well as access to seeds (Atalan-Helicke 2015, 644). Because the PVP Act provided exemptions that were not fully attractive to plant breeders, another regulation, a utility patent that involves the U.S. Patent and Trademark Office came into effect. A utility patent protects specific attributes of individual varieties, applicable to sexually reproducing and GE (genetically engineered) plants (Ramsey 2018, 202–203). A plant variety with a utility patent can only be used for crop production and can't be used for seed saving, resale, given away, or replanted (Johnny's Seeds 2017).

In the United States, there are also other rules at the federal- and state-level regarding the sale, labeling, breeding, testing of seeds, and their movement across state borders. These seed laws aim to protect the farmers and individuals from purchasing poor quality or mislabeled seed. (U.S. Department of Agriculture 1988). They also aim to protect patents and intellectual property rights for plant breeders and reward their innovation associated with modern cultivars (Atalan-Helicke and Mansfield 2012, 134).

The Federal Seed Act (FSA) of 1939 (amended in 1988) aims to regulate interstate and foreign commerce in seeds by requiring labeling with the goal of preventing misrepresentation in interstate commerce and setting standards for imported seeds. The FSA⁶ requires that seed labeling information and advertisements pertaining to the seed must be truthful, further working to protect farmers from receiving wrong (or defective) seeds, thus losing expenses of seed and crops (Ramsey 2018, 202). Moreover, the FSA ensures that seeds planted by farmers are not contaminated with undesirable "weed seeds." Seeds must be certified by a seed certifying agency showing compliance with rules, regulations, and standards of its class (U.S. Department of Agriculture 1988).

FSA works to promote uniform state laws and since the 1940s, intersects with the work of the Association of American Seed Control Officials (AASCO), representing the seed regulatory officials of the United States and Canada. AASCO meets annually and updates its *Recommended Uniform State Seed Law* (Association of American Seed Control Officials 2017), which provides a model state seed law. This Uniform Law includes an exemption on noncommercial seed sharing, which is critical, as the wording of a state seed law distinguishes between commercial and noncommercial seed distribution, and dictates whether a seed library can operate legally in a given state (Ramsey 2018, 204).

Regulation of Noncommercial Seeds

The Uniform Law defines noncommercial seed sharing as the distribution and exchange of seeds without monetary compensation. While it also clarifies rules regarding the labeling and educational requirements of noncommercial seed sharing, AASCO's model law is important for the functioning of seed libraries: By definition, anyone distributing seeds under seed sharing "may not expect, or create the expectation, that seeds must be returned in exchange for receiving seeds" (Association of American Seed Control Officials 2017). The law also defines the limit on the amount of seeds to be exchanged (Ramsey 2018, 204).

The nuances in state laws affect the legality of seed libraries, as they may be held to the same labeling and testing requirements of commercial seed companies. In 2014, the incident involving Cumberland County Library System (CCLS) and DOA in Pennsylvania was related to violation of state laws on the sale, distribution, and labeling of commercial seeds. The CCLS seed library officials were informed that their seed library was a seed distributor, and should be licensed annually (for \$25), follow labeling requirements, and conduct purity and germination analyses (Carolan 2018, 88). Because the state seed laws work to protect commercial seed quality, the DOA cited violations of labeling requirements as a potential danger to the agricultural system (SELC 2014). However, demanding that seed libraries comply with testing and labeling regulations designed for commercial seed companies places "an undue burden on the resources of nonprofit seed libraries and make it impossible for them to operate as community-based, often volunteer-run, organizations" (SELC 2017, 4). Such interventions facilitated seed activists and the Sustainable Economies Law Center (SELC) to ensure the legality of seed libraries, to clarify the ambiguity in the language of state laws about the "sale" of seed, and to exempt seed that is not sold or offered for sale from state laws (Musser 2014, 15).

The Pennsylvania DOA intervention led to a compromise for some seed libraries, as they decided not to accept returns of seeds from home-grown

plants (Carolan 2018, 91). In other instances, some seed libraries, such as in Pennsylvania and California, decided to close (Soleri 2018, 332). A seed library administrator⁷ interviewed for this research interpreted the incident.

I think the concern in Pennsylvania was if you come to our seed library and I give you seeds that say Sunsweet watermelon, and it's not, I'm participating in some sort of business fraud . . . And my response to that is, we're giving it away. We're telling you it's a local donation. So . . . let the buyer beware. We're not selling you something that's causing you to lose money if it's not pure. We're giving seed away in earnest hope that it is pure and to serve a greater purpose. (Personal Communication 2016)

Following 2014's incident, SELC immediately launched the Save Seed Sharing Campaign to spread awareness and build support for legal protections for seed libraries and other community-based seed sharing initiatives (SELC 2020). In 2015, SELC helped coordinate the first International Seed Library Forum in Arizona, and worked to pass state laws to exempt noncommercial seed sharing from burdensome requirements⁸ (SELC 2020). These new laws set a precedent to provide new guidance and to promote seed sharing among different stakeholders (Dove 2016, 24–25). Broadly, states interact with one another in the environmental policy arena, while interaction also occurs between states and the federal government. In our current interconnected world, understanding policy diffusion aids in the understanding of policy advocacy and change more broadly (Shipan and Volden 2012, 788). Studies demonstrate that strategic interactions in environmental policy are particularly prominent in the Northeast and Western United States (Billard et al. 2020, 15; Rabe 2008, 106). A close examination of select state policies can help us to better understand the broad array of interpretations that states have adopted, especially when confronted with the 2014 incident, and parameters set by the federal government. However, it is not a guarantee that these amendments or new interpretations will result in other states and policymakers following suit as there are several factors to consider, including intergovernmental networks, and time between federal and substate policy adoption (Beland et al. 2018, 535).

Select State Laws

We focus on policy in six states: New York, Massachusetts, Colorado, California, Virginia, and Wisconsin, as the representatives from their seed libraries completed both our survey and semistructured interviews. We focus on these six states to contrast the state-level approaches to seed libraries and provide a regional sampling across the United States. Moreover, some states have been examined in literature more than others (e.g., Pennsylvania,

California, Nebraska, Minnesota), and this research effort contrasts these highly examined states with other less-studied states. While all state laws address commercial seed sale and distribution, they differ in terms of how they address seed exchanges and seed libraries. While California's amendments specific to noncommercial seeds enabled room for seed libraries, several states (including Colorado) did not amend their laws because seed libraries did not work with patented seeds or engage with the "sale" of seeds.

California has long played a pioneering role in environmental protection and progressive policies. Indeed, the "California Effect" refers to the cross-state diffusion of its policies, pulling other states into its orbit when they adopt similar policies, as has been the case with climate change policy and efforts to reduce greenhouse gas emissions (Rabe 2008, 111). Because the first seed library was established there, and there is a well-established AFM,⁹ California chose to amend its state law. Representing a "departure from California's previous stance on seed sharing" (Ramsey 2018, 207), California became one of the first states to amend its seed law for exclusions on noncommercial seed sharing. While emphasizing the seed industry's role and commitment "to improve the quality and variety of seed available to the consumer-buyer," the amendment clarified that noncommercial seed-sharing "activity does not include receiving, storing or distributing patented seed" and thus "does not violate the federal PVP Act" (California Seed Law 2016). Several seed libraries in California also make few requirements on seed borrowing to fulfill a seed distribution role¹⁰ (Soleri 2018, 338).

The Colorado State Law regulates licensing, labelling, and sale of commercial seeds with specifications for germination and purity testing (Colorado Department of Agriculture 2020), emphasizing consumer and environmental protection. After the DOA's intervention in Pennsylvania, the Colorado DOA plant industry division released a statement clarifying seed sale and small-scale exchanges at seed libraries. The program manager Laura Pottorf stated: "The purpose of our seed law is to regulate business transaction with seed. At local seed libraries, no money is exchanging hands." These assurances gave a green light for seed libraries in Colorado to continue operations (Livick 2015).

Similar to Colorado's interpretation, seed libraries in Massachusetts also chose to emphasize the free nature of "borrowing" rare or heirloom seeds (Shea 2014). A similar emphasis also allowed the functioning of seed libraries in Wisconsin where policies exempt seed libraries from requirements of the state law provided there are no monetary or seed exchange requirements. The director of the Wisconsin Plant Industry Bureau, Brian Kuhn, emphasized that the state seed law's goal was "to create a system so that regulators know where all of the distribution points are," and thus, they asked seed libraries "to get a \$25 license" (Shepel 2016). Whereas some seed libraries in Virginia

adapted a Seed Protocol to ensure that “seed borrowers get accurately labeled seeds, and that participants share only healthy plants” (Lewis Ginter Botanical Garden 2020), others now emphasize a Borrow-Grow-Return policy with specific instructions on returning or donating seeds (Salem Public Library 2020).

Like California, New York had one of the first seed libraries established¹¹ in 2004, and as of March 2020, New York hosts more than twenty seed libraries (Beglinger 2020). While the state does not require licensing to sell or distribute seeds, its state law regulates the inspection and sales of seeds with a specific emphasis on “truth in labeling” (Westra 2016).

METHODS

Our qualitative case study research was conducted between January and April 2016 and triangulated both sources and methods (Creswell and Poh 2018, 53). We collected online (Qualtrics) and identical paper surveys from representatives at sixty-one U.S. seed libraries, and conducted ten semistructured interviews via phone and in-person with representatives from U.S. seed libraries (librarians or volunteer coordinators) and individuals involved in the organic agriculture movement in New York (e.g., garden manager, seed company representative).¹² Further, we conducted participant observation at two regional organic food conferences of the Northeast Sustainable Agriculture Working Group and the Northeast Organic Farming Association of New York. Respondents for semistructured interviews were selected among those who provided their contact information within our surveys, and agreed to follow-up with an in-depth interview. Semistructured interviews were conducted in English, recorded using digital voice recorders, transcribed, and coded. The participant observation during the conferences (where authors also *worked as volunteers*) provided a unique opportunity to document and collect data about seed-related conversations among stakeholders in the Northeastern United States, better understand emerging priorities and issues, assess concerns, and understand seed systems beyond what stakeholders say publicly (Creswell and Poh 2018, 18). Additionally, archival research was used to explore seed library websites, newsletters, and popular media articles.

FINDINGS

Functions and Priorities of Seed Libraries

As the literature suggests (Peekhaus 2018, 273; Soleri 2018, 332), a majority of seed library respondents were hosted in public libraries. Respondents

described free membership and simple borrowing rules. The majority, 80 percent, of respondents described open access, while a mere 5 percent limited membership by geographic region. As many seed libraries aim to enhance access to seeds, they also described their role in distribution of organic, local, open-pollinated, and heirloom seeds, free to the public.

Seed library functional development was better understood after isolating emerging concerns and priorities from their mission statements. We categorized these priorities as (a) education of the public on topics related to gardening, seed saving, culture of sharing, and community building; (b) expansion of seed access; (c) access to locally sourced food for food security; (d) creating locally and/or regionally adapted seeds; (e) preserving biodiversity; (f) promoting health of local communities; (g) resistance to corporate control in the food system, and (h) empowering local communities (table 10.1). Surveys showed that “resisting the power of multinational seed corporations” was mentioned across mission statements, particularly due to the role of corporate dominance in the seed sector. In most cases, the lines between different priorities were blurred. For instance, one administrator stated that their mission is to provide alternatives to the genetically engineered seed and processed foods by promoting self-resilience and locally grown food. While most of them focused on bolstering access and availability of seeds to aid regional food system resilience, addressing global climate change was also repeatedly listed.

Several seed library mission statements emphasized their “free” services as they provide “a *free* source of locally adapted, open-pollinated seeds,” “a *free* community service for home gardeners to exchange seeds,” or “*free* information on seed saving and growing food.” These statements highlight the sharing function that seed libraries emphasize to differentiate their role from commercial seed companies.

Effectiveness of Seed Libraries

We devised five measures to assess the relative resilience that seed libraries contributed to their regions: years active, partnerships, membership, funding, and volume of seed varieties (stored and exchanged) and categorized seed libraries regionally. We predicted that the most effective libraries would have been active the longest, established extensive partnerships, received external funding, maintained a large base of active members, and hosted a diverse seed collection.

External Partnership and Funding

In their rarity, heirloom seeds require expensive initial investments. The cost to build the original seed stock and replenish seed stocks require stable

Table 10.1 Seed Library Mission Statements Coded by Theme

Education	Seed Access	Local Food/Food Security	Regionally/Locally Adapted Seeds
<p>"To create a culture of learning, sharing, and community through sustainable seed saving that reclaims seeds as a public resource."</p> <p>"To provide a free service committed to enriching our community by educating its members in the practice of gardening and seed saving . . ."</p>	<p>"To encourage seed saving in our local area and to make seeds available for low income and less experienced members of our community."</p>	<p>"To access locally grown food and to build authentic connections with neighbors to create a vibrant, thriving . . . community."</p> <p>"To crate sustainable local food sourcing as well as growing a healthier . . . community through feeding ourselves and learning together the skill and art of [seed] saving."</p>	<p>"To create a publicly accessible source of regionally adapted seeds that is maintained by our community of novice and experienced farmers and gardeners."</p>
Preserving Biodiversity	Health	Food Sovereignty/Resistance to Corporate Control in Seed and Food System	Empower Local Communities/Gardeners
<p>"To collect and share bio-diverse, locally adapted plant seeds, cultivated by and for area residents."</p> <p>"To increase biodiversity of locally adapted seeds . . . by providing open pollinated heirloom seeds, encouraging people to garden, and sharing the knowledge of seed saving."</p>	<p>"To provide our local populace with the seeds and the information to assist them in growing wholesome food for their families and communities."</p>	<p>"To educate patrons on the practice of saving seeds for self sustainability . . . provide information on [GE food] and organic alternatives to processed food, educate low income patrons on cost effective ways to grow their own food and replenish their own seed stock."</p>	<p>"To bring back seed-saving traditions of many ethnic groups; to empower individuals and communities to produce the foods and seeds that do best in their environment."</p>

financial sources. "You can't run a seed program based only on donated seed," reads a survey response from one administrator who heads one of the most community supported seed libraries (over 1,000 active members). Although there is no clear trend that solidifies the relationship between community partnerships and financial assistance, 63 percent of libraries had at least one partner and received assistance in the form of seed and monetary donations. For the Northeast region, all seed libraries have at least one community partner and received financial assistance and seed donations.

Active Membership and Seed Varieties in Circulation

Our survey results found that 60 percent of seed libraries sampled were operating for only one to three years. The more years a seed library was active, the more connections they had to other seed libraries. Further, active membership was at the core of seed library functionality, with one respondent stating: "The folks who show up and make it run, [who] let their minds and hearts holds seeds" (survey respondent). To assess the true influence of membership, we looked at the relationship between the number of active members and the number of seeds in circulation (at each library) to determine a relative measure of resilience. The assumption was that seed libraries with most number of active members would also have the highest diversity of seeds in circulation. As a baseline assumption, we predicted that a robust base of twenty active members or more is likely to have more than 100 seed varieties in circulation. Nationwide, seed libraries boasting at least this level of active membership (twenty members) and seed circulation volume only comprised over a quarter of the total seed libraries that we sampled. Interestingly, we found that the limiting factor that yielded only a quarter of the seed libraries to qualify was not the number of members they had, but the number of seed varieties available for borrowing. Raising the stakes to fifty or more members but decreasing the benchmark of seed varieties from 100 to at least 50, we found that the same percentage of libraries qualified (about a quarter). At the extremes, active membership seemed to bear a positive correlation to the breadth of seed diversity. For example, the library with the topmost active membership circulated more than 1,000 seeds, while the least utilized library with no active members possessed only twenty-four varieties. This correlation was not an anomaly; seed libraries with the lowest active membership were often the same libraries that possessed the least diversity of seeds available. Meanwhile, the top five libraries with memberships exceeding 400 people had, on average, one hundred times more seed varieties in circulation (313 varieties) than the five seed libraries with the lowest membership (33 varieties). This trend was especially robust in the Northeast region, where we found that memberships of 100 or more also had over 100 seed varieties. This

suggests that active community involvement in a given seed library increases seed diversity.

Years Active and Interconnectivity

Our research aimed to understand how years of being an active seed library influences the number of formal and informal connections to other libraries. Seed exchange between seed libraries magnifies the scope of opportunity for each heirloom variety to be saved, redistributed, and replanted. To assess the level of interconnectedness between seed libraries, we cross-tabulated the number of years each seed library had been active and the frequency of interlibrary seed exchanges (table 10.2). Out of 61 respondents, 77 percent of libraries do not exchange seeds with other libraries. For the remaining 33 percent that have swapped seeds with other libraries, we found the highest level of interconnectivity were among libraries that had been active for four to seven years. In this particular bracket, seed libraries were more than three times as likely to exchange with other seed libraries compared to younger libraries aged one to three years. In addition to the increased likelihood of exchange, libraries aged four to seven participated in double the frequency of those exchanges compared to the newcomers.

Since we found that interconnectedness tends to increase with number of years established, it is logical that only about a quarter of seed libraries have exchanged with other seed libraries before, since the majority were just getting established (figure 10.1). Contrary to our hypothesis that interconnectedness enhances with age, we found that only one out of the four oldest seed library respondents has ever exchanged seeds with another library. Overall, most seed library administrators described these exchanges as informal or need-based only. As one seed library representative attested, “we have done so, but only occasionally, and not in any highly organized manner.” The hesitancy to exchange seed stocks with other seed libraries could also stem from limitations on interstate distribution of seeds specified in state laws, and a concern about limiting problems that could stem from purity to the specific local area in which the seed library functions.

Table 10.2 Inter Seed Library Loan in Relation to Years Active

<i>Years Active</i>	<i>Do Not Interexchange</i>	<i>Percent Total (%)</i>
1-3	5	87.5
4-7	8	55
8-11	1	0
12-15	1	66
All	46	75

For how long has your seed library been active?	Do you exchange seeds with other seed libraries?	
	Yes (If yes, how often and with how many seed libraries?)	No
1-3 years	4	
4-7 years	9	28
8-11 years	1	11
12-15 years	1	0
16-19 years	0	2
20 or more years	0	0

Figure 10.1 Active Years of a Seed Library in Relation to Interlibrary Loan. *Source:* Authors

Limitations and Barriers for Effectiveness of Seed Libraries

We found that the majority of administrators facilitate seed exchange on a volunteer basis, many in the confines of local public libraries. Stemming from the volunteer basis of their jobs, interviewees explained: (i) gaps in financial and community support for their seed library, (ii) challenges and obstacles for implementation, and (iii) effective methods for long-term success. A volunteer seed library coordinator in Virginia expressed their concerns with entrusting the integrity and survival of heirloom seeds to inexperienced seed savers, but commended their operation for offering educational resources that address heirloom seed mismanagement: “[operating with volunteers], we’re not going to be able to guarantee the biological efficacy of every seed. [Yet] I think we do pretty darn well because we educate people” (Personal communication 2016). The coordinator also noted “time constraints,” and added the challenges due to “logistics of running a pretty functional program [without] having the connect- edness that a full-time employee would have” (Personal communication 2016).

These findings confirm the literature that seed libraries require operating costs that mainly stem from purchasing seeds and paying for staff time. Peekhaus (2018) argued that the estimated operating costs of a seed library is \$2,500 annually, and it tends to decrease as more patrons return seeds, or the library receives more seed donations (275). In general, a public library contributes to the seed library by providing staff time to facilitate seed library operation, although there is no specific line item for this budget. Because the labor requirements of a seed library tend to be seasonal, a public librarian can run seed library operations with volunteers (Peekhaus 2018, 276). Soleri’s (2018, 332) findings also confirmed that public libraries are critical to the functioning of seed libraries, as they provide

a physical space, access to library webspace, scheduling ease with complementary activities, and an opportunity to stay open for more hours.

Seed Return Policy

Seed libraries organize seed-saving workshops to teach about seed-saving skills, even though 50 percent of our respondents did not expect members to return seeds. While 15 percent encouraged returns on easy-save seeds, only 5 percent expected returns of borrowed seeds that exceeded double the amount borrowed. Similar to how seed libraries emphasize borrow and grow function, our respondents emphasized that “only those who attended educational workshops or are advanced gardeners” to return seeds, “take a class” before return, “return only the seeds that one is comfortable” with saving and identifying. Indeed, 30 percent of seed libraries had incorporated some criteria for returning seeds, including no hybrid or genetically engineered seeds accepted, only open-pollinated seeds accepted; only heirloom seeds accepted; donations from regional companies or regionally adapted seeds accepted. No seed library required lab germination tests upon return of the seeds to the library to ensure the quality and growth viability of the seeds being returned. While requiring germination tests would ensure heirloom purity, it could also pose a hurdle for members with a lack of time and/or funding.

DISCUSSION AND CONCLUSION

Seed libraries serve multiple functions in the American agri-food system to establish local food systems and build resilience. While concerns about agri-food system changes have facilitated the emergence and initial expansion of seed libraries, policy amendments and/or reinterpretations, particularly in the state seed laws, have facilitated their recent expansion. Policies that allow for noncommercial seed exchange and distribution are critical, as they allow public exchange of locally adaptable, open-pollinated seeds, and promote seed-saving knowledge in the hands of gardeners and local communities. Seed libraries have also bolstered broader conversations about seed sovereignty, as seed libraries emphasize the role of local farmers, gardeners, and the community, in conserving agricultural biodiversity (Atalan-Helicke 2015, 646). In the AFM, seed libraries, like farmers’ markets and community gardens, also hold the promise of heightening equity, providing healthy food to low-income community members (Ramsey 2018, 216).

These case study findings suggest that (a) The more years a seed library is active, the more connected they are (formally/informally) to other seed libraries; (b) Active community involvement increases the manifold of seed diversity in exchange; and (c) Community partnerships, at least in the Northeast region of the United States, likely lead to financial assistance and a

greater quantity of seed donations. Formal development of state and federal policies and the creation of supportive legal environments for seed libraries (to operate) is critical for providing broader access to locally adaptable seeds and preventing the loss of traditional seed saving knowledge and networks. While bolstering public education of gardeners, policymakers, and communities about the role of seeds in food systems, seed libraries also promote an interest in gardening among younger generations.

The quality of returned seed and the (sometimes) inadequately labelled seed packets are still a concern for seed libraries. With an emphasis on “free” services, seed libraries face challenges in terms of guaranteeing that patrons will return and exchange seeds. Because many seed libraries are understaffed, they may also have difficulty maintaining their return procedures, despite measures to maintain quality in their collection (Dove 2016, 44). Seed libraries are also cognizant of seed quality for agricultural purposes, and sometimes hesitant to accept donated seeds, or may limit donations to certain types of seeds. Further, seed libraries are not likely to exchange seed stocks with other seed libraries, due to concerns about purity and/or legal limitations on interstate distribution.

Our research found that policy decisions at the state level have at times addressed noncommercial seed exchange, with these interpretations serving as models for action in other states, which in turn could further protect seed libraries from uncertain legal environments. In the environmental policy arena, states interact with one another, as well as with the federal government. And while it is important to consider the role of federal legislation in shaping and managing intergovernmental relations, it is also important to consider the role of policy diffusion *across* states. State policy innovations may also trigger a national debate *vis-à-vis* seed systems instigating bottom-up policy changes. Yet, as the nuances in interpretations show, the outcomes of these debates vary by state. Enabling policies at the state level, coupled with supportive legal environments for seed libraries (to operate and expand), are critical for facilitating the suite of social and environmental benefits that we have documented above.

NOTES

1. The seed industry which was characterized by thousands of small, mostly family owned business before 1970s has now become dominated by just three agrochemical firms controlling more than half of the global proprietary seed market (Howard 2015, 2489).

2. Genetic diversity refers to the genetic variability among or within a sample of individuals of a variety, population, or species. “A broad genetic base is necessary to keep plant populations strong” (Conner 2015, 17). Unfortunately, the loss of seed varieties is connected to the loss of genetic diversity (Conner 2015, 19).

3. Open pollinated plants are those, if properly isolated from other varieties in the same plant species, will breed true. That is, the seed will produce a plant very similar to the parent (Conner 2015, 8).

4. The first seed library, Bay Area Seed Interchange Library (BASIL) was established at the Berkeley Ecology Center in CA by Sacha DuBrul and run by volunteers (Conner 2015, 13).

5. A seed can be rare for several reasons: A variety or strain that has been stewarded by a family or community for generations and not shared beyond or a family heirloom which has been passed down only through the hands of the same family would be rare. Some of these are also called heirloom varieties. An ex-commercial variety that has been dropped from seed catalogues or a new variety created by a producer would also be rare (Dove 2016, 25).

6. The FSA covers seed used in the agricultural production of food, feed, fiber, and turf, but does not regulate flower, tree, shrub, or seeds used primarily for revegetation purposes (United States Department of Agriculture 1988).

7. There are no interview subject names used in this chapter. Only pseudonyms were used during coding and analysis stage of the research.

8. The first state law for exemptions for noncommercial seed distribution passed in Minnesota. Nebraska followed suit (Ramsey 2018, 205–206).

9. Such initiatives emphasizing localization of food systems in California include “Good Food Purchasing Pledge” by school districts, “California Regional Seed System” chapter of Organic Seed Alliance’s farmer-plant breeder collaboration to develop locally appropriate seed for organic production as well as passage of GE free agriculture measures in several countries in California (Soleri 2018, 333).

10. In a qualitative study with forty-five seed library managers in California, Soleri (2018, 336) found that annually 6,456 packets of seeds, mostly of commercial seeds from small seed companies, are distributed by seed libraries in California.

11. In 2004, Hudson Valley Seed Library was established by Ken Greene in Gardiner, NY. It went online in 2008, and in 2009, the Hudson Valley Seed company began. Since then, the company has propagated heirloom and open-pollinated vegetable and flower seeds for Northeast climate, and started collaborations across farmers and various stakeholders for seed sovereignty and sustainable and resilient food systems (Hudson Valley 2020).

12. We did not collect demographic data about the research subjects (gender, age).

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