

## **A livelihoods assessment of new entrants within the US fisheries agriculture continuum**

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### **Abstract**

Commercial fishing and farming are critical industries that ensure national food security, provide employment opportunities, and contribute to the well-being of rural livelihoods and communities. In the U.S., both industries face a looming challenge in the aging of their workforce and concerns about their long-term resilience. In this study, we document the issues faced by young farmers and fishers in the U.S. using a systematic literature review and expert interviews. These issues are analyzed and contextualized using the capital assets framework or livelihoods approach, which includes financial, physical, natural, human, and social capital, to understand the structural issues faced by individuals seeking occupations in commercial fishing and farming. We then examine the diverse programming that has been developed to facilitate entry into both industries across the capital assets framework. Fundamental issues continue to impede entry into both industries, but the mechanisms that have been developed in farming to address these challenges are far richer in variety, scope, and depth. This is at least in part due to the long-term national recognition of the aging crisis in farming and the centralized nature of data collections, funding, and programs that exist to help beginning farmers. In stark comparison, piecemeal efforts have been undertaken across the country to address fisheries entry issues resulting in disparate, micro-level programs that address a singular capital asset at a very localized scale. The interrelatedness of these issues across these industries and how they are being addressed provides a vantage point that is imperative for building knowledge and understanding of dynamics that may be tackled with cross-cutting programs.

Key words: beginning farmers, graying of the fleet, aging demographic, rural livelihood, capital assets

### **1. Intro**

There are marked similarities between commercial fishing and agriculture in the U.S., yet these similarities are often overlooked. Herein we define commercial fishing in terms of the harvest of wild marine fish (not aquaculture) and agriculture as the production of fruits, grains, nuts and vegetables as well as the ranching of livestock. Both industries are the cornerstones of rural life and are critical in sustaining global and national food security, providing jobs, and fueling national and international markets (Carothers and Chambers 2012; Cramer et al. 2018; Johr 2012). In rural America, commercial fishing and farming are also deeply rooted in kinship networks and cultural ties that span generations and underlie personal, place, and social identities (Carothers 2010; Inwood et al. 2013; Liffman et al. 2000).

Farming and fishing in the U.S. are facing a generational turnover crisis, as many in both industries are on the cusp of retiring without anyone who is able or willing to take over their operations (Johr 2012; Calo 2018; Donkersloot and Carothers 2016). The lack of generational renewal may ultimately pose a national food security problem if there are insufficient people with knowledge and ownership of fishing and farming to run these industries (Lobao and Meyer 2001; Ringer et al. 2018). While there is a growing body of literature documenting issues around entry into both commercial fishing and farming in the U.S. (Ackoff et al. 2017; Calo and De Master 2016; Cramer et al. 2018; Donkersloot and Carothers 2016; Johnson and Mazur 2018), there is no examination of the interrelatedness of these issues across these industries and how they are being addressed. This study bridges this gap, documenting the impediments faced by young farmers and fishers in the U.S. and the programming that exists to tackle these issues.

Federal funding in the U.S. for education, mentoring, and technical assistance for beginning farmers and ranchers began in the 1860s, with a grant program that would evolve to the modern day Beginning Farmer and Rancher Development Program<sup>1</sup>. Despite this effort, in 2017 the Census of Agriculture, which has collected detailed demographic data on all U.S. farmers since the 1840s, showed that nearly two-thirds of farmland is in the hands of someone over 35, while the ratio of farmers over the age of 65 to those under 35 is 6 to 1 (Ackoff et al. 2017). Similarly, the aging of fishermen in the U.S., commonly referred to as the “gr(e)aying of the fleet”, is increasingly documented across the country, with an average age in many regions of over 50 years old (Donkersloot and Carothers 2016; Cramer et al. 2018; Johnson and Mazur 2018). Congressional recognition of the issue led to the establishment of the Young Fishermen’s Development Grant Program in 2021, modeled on the Beginning Farmer and Rancher Development Program, to provide training, education, outreach, and technical assistance initiatives for young fishermen, although with a comparatively more narrow scope and lower total budget as described in more detail below.

The lack of young participants in fishing and farming is in part associated with broader rural out-migration patterns and the rapidly aging demographics of these communities that represent the employment pool for fisheries and farms (Donkersloot 2005; Glasgow and Berry 2012; Johnson and Lichter 2019). Between the 1980 and the 2012-2016 American Community surveys, the number of individuals in rural areas that are 65 and older jumped from 10.9% to 17.5% (Smith and Trevelyan 2018). Researchers note that in part the tremendous obstacles faced by young participants trying to get into fishing and farming, as the main occupations in rural America, are contributing to this continued outmigration (Lobao and Meyer 2001; Carothers 2010; Szymkowiak and Kasperski 2021). For example in Alaska, where the issue of the graying of the fleet is arguably the most studied, there has been an outmigration of 30% of local fishing permit holders from rural communities over the last several decades, eroding local connections to fisheries that are vital for learning, apprenticeship, and potential business opportunities for young fishermen (Cullenberg et al. 2020).

Fishing and farming are both highly risky businesses – subject to weather, interannual variability in harvests, market fluctuations, regulatory changes, diseases and pathogens, and increasingly climate change impacts (Holland et al. 2020; Johr 2012). Fishermen and farmers face high upfront or startup costs and often lack the capital necessary to purchase farmland, fishing boats, fishing and farming gear, and constantly evolving technology (Ringer et al. 2018; Coleman et al. 2019). The coupling of escalating costs with rising uncertainties from markets and climate change mean that new entrants into these industries face a confluence of conditions that create formidable challenges to entry and success (Nadolnyak et al. 2019; Coleman et al. 2019).

The entangled nature of fishing and farming industries with rural community well-being and national food security points to the necessity of maintaining accessibility to these industries for the next generation. Using the livelihoods approach to contextualize and analyze emergent themes from a systematic literature review and expert interviews, this study points to foundational issues that impede entry into commercial fishing and farming and the mechanisms that can help to facilitate entry. The programming that has been developed to try to address barriers to entry into fishing and farming is then compared across the capital assets captured in the livelihoods approach. We demonstrate the tremendous disparities in targeted programming for new entrants in these occupations borne out of fundamental differences in the national recognition of issues with entry leading to centralized efforts in farming. We conclude with a series of recommendations on how to bridge this gap for new fishermen by equipping them with the most successful tools that have been employed for beginning farmers.

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<sup>1</sup> <https://nifa.usda.gov/program/beginning-farmer-and-rancher-development-program-bfrdp>

## 2. Methods

We employed a multi-method approach including a literature review, expert interviews, and qualitative coding to examine issues and programming related to new entrants into fishing and farming. We conducted an exhaustive literature review to conceptualize the issues new fisheries entrants and beginning farmers face, using the following search terms: "beginning farmer" AND "US"; "beginning farmer" AND "barriers to entry"; "farmer" AND "barriers to entry"; "young farmer problem"; "generational renewal" AND farms; "gre(a)ying of the fleet"; "barriers to entry" and "fisheries". The terms "gre(a)ying of the fleet" and "barriers to entry" are commonly used in the fisheries literature to describe the problem of access, entry, and generational turnover (Donkersloot and Carothers 2016; Cramer et al. 2018; Johnson and Mazur 2018). The term "beginning farmer" is used by the U.S. Department of Agriculture (USDA) in targeted programming for farmers with 10 or fewer years of experience (Ahearn and Newton 2009). The terms "young farmer problem" and "generational renewal" are periodically used to describe US farming (Lautz 2015). Because the terminology describing the lack of new entrants in US agriculture is inconsistent, the literature examined for farming extended to papers referenced in USDA reports. Since much of the impediment to fisheries entry is attributed to the effects of specific management programs that constrain access - catch share and limited access programs - we also used search terms including "catch shares" and "entry"; "limited access" and "fisheries" and "entry". We limited the geographic scope of our study to the United States to facilitate a comparative analysis of programming for new entrants into fishing and farming, much of which is contextualized within the federalism of the U.S. governing approach. With this approach we found a total of 43 relevant fisheries publications and 33 farming publications.

We then conducted reflexive thematic analysis of text specific to issues surrounding new entrants into fishing and farming within these publications (Thorne 2000; Braun and Clarke 2006). Overarching themes were identified from the text and coded using a mixture of inductive and semantic coding. Both approaches utilize the content of the data to derive codes and themes, with semantic coding reflecting the explicit content of the data. We employed semantic coding as much as possible to retain the original language in the analysis but applied inductive coding when the derivation of themes necessitated summary language. Supplementary Table 1 provides the full thematic analysis inclusive of the themes, associated citations and references.

The other component of this research project focused on understanding the programs that have been developed to address issues surrounding new entrants into fishing and farming. The literature review outlined above provided some information about this programming, which we further supplemented with Internet research using the same terms as specified in the literature review above, as well as program specific language including "Beginning Farmers and Ranchers Development Program", "Young Fishermen's Development Act", and "crew apprenticeship".

Finally, we conducted interviews with experts about issues and programming related to new entrants into fishing and farming. Expert interviews are qualitative interviews focused on topical knowledge of the interviewee, specific to a given area of inquiry (Meuser and Nagel 1991; 2009). We interviewed Sea Grant and Cooperative Extension agents, who apply research-based information to constituents working in marine and agricultural environments, respectively. We conducted interviews with Sea Grant agents in states that have developed programming for fisheries new entrants including Alaska, California, Oregon, Washington, Georgia, Texas, and Louisiana. Similarly, we conducted interviews with beginning farmer training program representatives and Cooperative Extension agents in states with large agricultural production and/or wide distributions of beginning farmers including Alaska, California, Maine, Florida and Iowa.

### 2.1 Capital Assets Framework (or Livelihoods Approach)

We applied the capital assets framework (also known as the livelihoods approach) to examine the diversity of issues faced by the next generation of farmers and fishers. This framework is widely used in the literature to understand the underlying vulnerabilities and strengths of individuals and households in the context of their livelihood strategies, and allows for a comprehensive understanding of the socio-economic conditions and constraints underlying livelihood strategies (Chambers and Conway 1991). People can use or develop a mix of capital assets - human, social, natural, physical, and financial capital - in the pursuit of their livelihood strategies (Badjeck 2010).

The livelihoods assets are comprised of:

- Human capital - including physical and mental health, knowledge and skills, capacity to work, personal resilience
- Social capital - including kinship ties and heritage, networks and connections, norms and values, social trust, collective representation, political participation
- Natural capital - including access to wild foods, food security, resource stewardship, environmental services
- Physical capital - including equipment, infrastructure (e.g., working waterfronts, transportation, energy), tools and technology
- Financial capital - including savings, credit and debt, financial assets, wages

Although the capital assets framework is largely applied in the developing country context, it has been used to explore issues of access and community resilience in U.S. fisheries (Himes-Cornell and Hoelting 2015; Lavoie et al. 2018). The application of the capital assets framework in our study emerged from the thematic analysis of the literature rather than being a predetermined method for this work. The literature contextualizes barriers to entry into farming and fishing within broader social, economic, biological and cultural environments that are inherently grouped into the asset categories that underpin the capital assets framework. We therefore applied the framework to group the themes that emerged from our analysis, populating each of the assets with a diversity of components that impact new entrants into fishing and farming. The capital assets framework allows for a broader and more comprehensive understanding of the socio-economic conditions and constraints underlying livelihood strategies. In the context of farming and fishing this implies understanding the complexity of issues faced by those entering or in the early stages of their careers in these industries beyond simply looking at access to land and fishing capital alone.

### **3. Results and discussion**

#### **3.1 Examining access into farming and fishing using the livelihoods approach**

The issues faced by new entrants into fishing and farming are greatly intertwined and mirrored in the themes that emerged from our analysis. Table 1 documents those themes across the five different types of capital assets - human, social, natural, physical, and financial capital. While costs loom as the overarching constraint on entry, the landscape of issues for both industries is diverse, complicated, and multifaceted across all components of capital assets.

At the core of issues surrounding entry into fishing and farming is the fundamental loss of access to harvesting privileges for the former and land for the latter. This is contextualized in the literature in terms of the intersection of physical and natural capital. In fisheries, much of the entry discourse focuses on the impacts from limited access privilege programs (LAPPs), which restrict access to a limited number of participants at a given point in time with following generations having to buy access or harvesting privileges (Donkersloot and Carothers 2016; Cramer et al. 2018). In many cases, LAPPs have resulted in increasing entry costs for fishermen due to consolidation and increased earnings for remaining fishermen (Carothers 2010; Cramer et al. 2018; Ringer et al. 2018). In turn, high entry costs

leave new entrants with high debt and less money for vessel maintenance or upgrades, which permeates throughout communities in reduced crew earnings and lost business for marine support services (Szymkowiak and Himes-Cornell 2015). This is compounded by revenue losses for local support services due to overall consolidation, which can precipitate the failure of these businesses leaving fishermen without a local place to have critical repairs (Doyle et al. 2018; Tookes et al. 2021).

Similar to the loss of access to harvesting privileges for beginning fishermen, the inability to access land is the primary barrier to entry for beginning farmers (Calo and De Master 2016; Ackoff et al. 2017). Steadily increasing land prices, coupled with consolidation of small farms into larger operations prohibits beginning farmers from physically or financially accessing farmland (Ackoff et al. 2017; MacDonald 2020; Katchova and Ahearn 2016). Further compounding the land access barrier, the increase in land prices may be an incentive for aging farmers to continue farming with the hopes of receiving a greater return on their investment upon retirement (Katchova and Ahearn 2016). Policies to support U.S. farmers may be further incentivizing consolidation as larger operations receive more in government payments that increase their chances of survival relative to smaller operations (Key and Roberts 2006). In effect, government policies in both fisheries and farming intended to increase or stabilize production have contributed, and in some cases led, to issues with entry into these occupations.

Another form of physical capital - technology - has also framed entry into fishing and farming, making it more expensive and risky (Ringer et al. 2018; Ackoff et al. 2017). Technological advances in many fisheries have reduced a reliance on manual labor, compounding impacts of vessel consolidation on crew employment and learning opportunities, making long-term entry prospects less likely (NPFMC/NMFS 2016). In other regions of the U.S., especially in the Gulf of Mexico and Southeast, issues around physical capital and entry are largely due to the increasing age of fishing vessels and associated insurance and physical risks posed by that, as well as the loss of commercial fishing infrastructure like docks, support service businesses, and processors (Tookes et al. 2021). In farming, technological improvements have both aided and hindered new entry opportunities as these improvements are facilitating the continued participation of older farmers by reducing manual labor requirements of farming work (Carolan 2018).

Other dimensions of natural capital and its intersection with entry into fishing and farming focus around food security, stewardship, and tenant arrangements. In Alaska's fisheries, there are strong interconnections between commercial fishing and subsistence provisions for communities through food sharing networks (Donkersloot and Carothers 2016). Because young fishermen play a critical role in those networks in supplying fish to community elders, the loss of new entry opportunities is severing network bonds and undermining food security (Donkersloot and Carothers 2016; Szymkowiak and Kasperski 2021). As of 2017, the US was the world's largest agricultural exporter (OECD 2018) and in 2021 those exports reached record highs totaling \$177 billion USD (USDA 2022). High entry costs result in indebtedness for new fisheries entrants (Carothers 2010) and many new fishermen enter into leasing arrangements with permit holders in an effort to diversify their fishing portfolios to make their operations more viable (Ringer et al. 2018). Yet the coupling of debt and leasing has been associated with decreased stewardship, as new entrants strain to generate as much income from fishing as possible (Carothers 2010; Szymkowiak and Himes-Cornell 2015; Ringer et al. 2018).

In a similar fashion to the lease arrangements made by new fishermen, many beginning farmers rent farmland to gain experience or when there is reduced access to farmland available for purchase (Katchova and Ahearn 2016). Farmland leasing is frequently presented as a viable option when developing agricultural policies for beginning farmers yet research has suggested that leasing arrangements can be tenuous (Calo 2018; Ackoff et al. 2017). Beginning farmers must plan their

crops around lease lengths and the eventual vacating of the land, as well as navigate the ramifications that necessary capital improvements on leased farmland may add value to the property but will stay with the landowner when the tenant farmer vacates (Calo and De Master 2016). Tenant farmers must also navigate the complications that can arise from the interpersonal relationships required in leasing arrangements. For example, landlords may disapprove of the farming methods being employed, requiring the farmer to redevelop their business plan for the sake of appeasing the landlord (Calo and De Master 2016). Circumstances such as these can add another element of uncertainty for tenants who rely on social networks to make connections around land availability (Carolan 2018; Calo and De Master 2016).

Many fisheries entry issues center around the impacts of LAPPs, which create an endowed group of individuals with limited incentives for divestiture and a market advantage due to leasing privileges (Szymkowiak and Himes-Cornell 2015; Szymkowiak et al. 2020). The often substantial expense and high debt associated with purchasing fishing operations decreases the possibility of diversification and is perceived as another risk for new entrants into an industry that is already very risky (Ringer et al. 2018). The increasingly capitalized nature of fisheries operations in LAPPs disincentivizes transfers of fishing businesses due to expectations around having to pay large capital gains taxes and wanting to maximize sales prices to finance retirement (Johnson and Mazur 2018; NPFMC/NMFS 2016; Cramer et al. 2018). Furthermore, new fisheries entrants often lack fundamental financial literacy and business management skills, as well as sufficient access to credit to be able to make the large-scale investments that are needed in fisheries (Donkersloot and Carothers 2016; Tookes et al. 2021).

New entrants into farming face similar issues with limited access to financial capital. Beginning farmers communicate an inability to access the necessary credit or collateral required by many loan programs (Ackoff et al. 2017; Katchova and Ahearn 2016). Presently, more beginning farmers hold college degrees than at any other point in time, with 55% of beginning farmers holding Bachelor's degrees in 2017 (Ackoff et al. 2017). However, this educational attainment often comes with substantial debt, with beginning farmers increasingly conveying that student loan debt greatly impacts their ability to obtain the necessary financial capital required to start a farming operation (Ackoff et al. 2017). Reduced access to credit not only inhibits prospective farmers, poor credit also impacts beginning farmers' abilities to expand, diversify and make necessary capital improvements including the purchasing of essential farm equipment. The inability for beginning farmers to access financial capital can have cascading effects that hinders their ability to access the physical and natural capital necessary to run a farming operation (Ackoff et al. 2017; Katchova and Ahearn 2016; Carolan 2018; Calo and De Master 2016).

Despite the significant role of physical, natural, and financial capital in framing access into fishing and farming, much of the literature for both focuses on how the loss of that access and broader socio-cultural trends have affected the human and social capital of new entrants (Calo 2018; Donkersloot and Carothers 2016). Prohibitive entry costs, steep fluctuations in earnings, the devaluation of crewmembers status, the necessity of access to capital, and vessel consolidation have fundamentally changed how people enter and move up in fisheries and undermined the historical values around this occupation (Carothers 2010; Frawley et al. 2020; Haugen et al. 2021). Decreased interest in fishing hinders intergenerational ecological knowledge transfer and compounds rural outmigration patterns associated with the pursuit of different occupations and lifestyles (Lowe 2015; Frawley et al. 2020; Haugen et al. 2021). Similarly in farming, where large-scale consolidation occurred decades ago, rural outmigration and a declining interest in farming have reduced the availability of young people to work on and take over farms as well as the intergenerational transfer of knowledge around this occupation (Johnson and Lichter 2019).

In both fishing and farming, new entrants increasingly have higher education aligned with broader social changes, but in fisheries this also reflects the necessity of more education due to the complex regulatory environment of fishing (Cramer et al. 2018). In turn, higher education allows greater occupational mobility for young people who often diversify their household income with non-fishing and farming activities as an adaptive strategy (Szymkowiak 2020; Ackoff et al. 2017). Occupational diversity is also critical in providing healthcare insurance, the lack of which in fishing and farming can be a deterrent for new entrants (Szymkowiak and Kasperski 2021). In fisheries, changing conditions around earning potential and retirement incentives have led to an increasingly aged population of fishermen, as well as high mental stress and increased issues around physical safety for the young fishermen that are participating (Szymkowiak and Himes-Cornell 2015; 2017).

Changes in intergenerational access have undermined social cohesion and values around both fishing and farming, destabilizing social networks that are critical to intergenerational pedagogy in communities and leading to shifting baselines around perceptions of access (Himes-Cornell and Hoelting 2015; Ringer et al. 2018). In farming, this has been exacerbated by intergenerational differences around perceptions of best practices and skepticism about new methods and crops and their impacts on family traditions (Clark et al. 2012). New entrants in fishing and farming have largely been excluded from associations, support networks, and collective representation (Johnson and Mazur 2018; Carolan 2018). In fisheries, there is also discussion around the devastating implications of drug use among participants which is contributing to a degradation of common rules and sanctions around fishing work (Szymkowiak and Kasperski 2021). The erosion of kinship ties and shared values around fishing and farming have contributed to fewer multigenerational fishing families and farms (Cramer et al. 2018).

Table 1. Capital assets framework related to new entrants in fishing and farming developed from literature

	<b>Fishing</b>	<b>Overlap</b>	<b>Farming</b>
<b>Human</b>	<ul style="list-style-type: none"> <li>• Decreased physical safety from strained fishing conditions, leasing practices, and lack of ecological knowledge</li> <li>• Reduced crewing opportunities and capacity to learn diverse fisheries</li> <li>• Lower capacity to adapt for new entrants due to smaller boats and high permit costs</li> <li>• Erosion of crew power and status</li> <li>• Increased mental stress associated with reduced earnings potential</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of access to healthcare</li> <li>• Reduced interest</li> <li>• Increased complexity of regulatory environment</li> <li>• Rural outmigration</li> <li>• Greater occupational mobility associated with higher education</li> </ul>	<ul style="list-style-type: none"> <li>• Training programs often neglect larger structural issues that reduce access by individualizing responsibility</li> <li>• Increased higher education of young farmer</li> <li>• Social barriers (for women &amp; minoritized peoples) impede learning opportunities</li> </ul>
<b>Social</b>	<ul style="list-style-type: none"> <li>• Intergenerational inequity and intra-community social conflict around access and distribution of fishing benefits</li> <li>• Loss of rural fishing permits and fisheries access</li> <li>• Cultural norms around work ethic and drug behavior eroding</li> <li>• Lack of participation in fisheries management process</li> <li>• Lack of collective representation</li> </ul>	<ul style="list-style-type: none"> <li>• Increasing emphasis on formal education</li> <li>• Less social consensus around fishing/farming as an occupation</li> <li>• Intergenerational pedagogy eroded</li> <li>• Fewer multigenerational operations</li> <li>• Decreased intergenerational knowledge transmission</li> </ul>	<ul style="list-style-type: none"> <li>• Social pressures to “prove” one's abilities to other farmers</li> <li>• Skepticism of new methods and crops creates intergenerational conflict and inhibits sales of farms to beginning farmers</li> <li>• Associations and support networks not inclusive of beginning farmers</li> </ul>



- Degrading social networks around access and identities

## Financial

- Mixed perceptions about the profitability of fisheries
- Quota shares are retained to finance retirement
- Decreased crew shares as a percent of total vessel revenues
- Increased reliance on direct marketing and value added strategies
- QS leasing practices deter QS sales
- High costs of living in remote rural communities
- Difficulties transferring intact fishing businesses from retiring fishermen to younger community members
- Capital gains taxes disincentivize transfers of fishing businesses
- Imported seafood lowers dockside prices for fishermen and makes fishing less profitable

- Financial barriers to entry
- Lack of pension system
- High debt-to-income ratios
- Lack of access to credit
- Need for increased collateral
- Disempowering leasing arrangements
- Reduced ability to grow the business
- Increased specialization resulting from policy decisions on subsidies and LAPPs
- Lack of financial literacy, business management skills, and knowledge of aid programs

- Disproportionate number of crops subsidized, often favoring large operations
- Disproportionate funding allocation to BDRDP
- Reduction in local lenders that utilize “soft-data”
- Farm programs and government payments directed towards more established operations
- Increased lender consolidation and increased standardized lending operating procedures reduces the number of smaller/regional lenders that traditionally lent to small/startup operations
- Older farmers disincentivized from retiring because of technological improvements that reduce physical labor
- Underrepresented farmers receive special loan considerations
- Farm successors also inherit debt associated with farm
- Beginning farmers have greater reliance on off-farm income

- Credit and capital inhibit diversification opportunities

- Landowners can receive financial benefits through a variety of programs by providing land access to beginning farmers

<p>Natural</p>	<ul style="list-style-type: none"> <li>• Less access to wild foods from commercial-subsistence interactions due to outmigration of young people</li> <li>• Erosion of food sharing networks and food security in fishing communities</li> <li>• Decreased stewardship of the resource associated with indebtedness</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced access to farmland and harvesting opportunities</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of farmland from failing farms</li> <li>• Increased interest in conservation and stewardship of the resource</li> <li>• Commodification of land creates fewer long-term leasing options</li> <li>• Beginning farmers are less likely to inherit farmland</li> </ul>
<p>Physical</p>	<ul style="list-style-type: none"> <li>• Fewer support service businesses and degradation of working waterfronts</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced access to capital for upgrading operations</li> <li>• Consolidation of operations</li> <li>• Expensive technology adds expense and risk</li> <li>• Technological advances have altered employment, learning, and acquisition opportunities</li> </ul>	

## 3.2 Programming related to capital assets for new fisheries entrants and beginning farmers

### 3.2.1 Programming for beginning farmers

The realization of issues around entry into farming began decades ago, when consolidation of farming operations coupled with a mass migration of young adults from rural to urban and suburban areas led to a lack of new entrants into the farming industry (Hottel and Berry 1978). The national recognition of the new entrant issue in farming has provided for the creation of federal umbrella programs directly targeting the diversity of capital asset needs of new farmers as well as regional efforts that deploy national grants to develop locally-relevant programming<sup>2</sup>. Fundamental to improving programming, the USDA tracks and reviews the use of its funds across various beginning farmer efforts, houses a clearinghouse of information regarding new farmers (called Farm Answers), and has been advised by its Committee on Beginning Farmers and Ranchers since 1992 on how to provide services to beginning farmers.<sup>3</sup> There are also dedicated staff in the USDA, cooperative extension programs, farm links, and non-governmental organizations NGOs that work specifically on beginning farmer issues.

The majority of agricultural programs for beginning farmers are focused on financial capital, yet there is additional emphasis on the natural, physical, social and human capital. Figure 1 demonstrates the diversity of programs that have been established for beginning farmers, the capital assets that they address, and which entity developed them.<sup>4</sup> The coloration of the lines depicts the capital asset that is addressed by each program, with many programs addressing more than one type of asset, as described in more detail below. Table 2 details the types of programs that are provided for new entrants into fishing and farming, providing a description by program type. The programs that are included herein are available at little to no cost; there are also higher education programs in agriculture focused on sustainable practices through universities that are not included because of their comparatively higher costs.

The USDA's Farm Service Agency (FSA) has loan programs for new farmers to support start-up costs and farm development. There are three primary loan programs geared towards beginning farmers: direct, guaranteed and microloans. Both the direct and guaranteed loan programs have a portion of annual available funds set aside specifically for financing beginning farmers, and are intended to purchase land, fund large capital improvements, equipment purchases, and servicing debt. In the 2021 fiscal year, the FSA was appropriated \$7,212,386,843 in targeted funds<sup>5</sup> available in Direct Operating, Guaranteed Operating, Direct Farm Ownership and Guaranteed Farm Loans - making up 57% of the total amount available for the specified loan programs. The microloan program was designed specifically to address the unique challenges that beginning and socially disadvantaged farmers face accessing capital by creating a simplified application process that requires substantially less paperwork than other loan programs<sup>6</sup>.

The FSA has also developed additional opportunities for new farmers to access necessary financial capital by attenuating credit needs associated with traditional loans. For example, the FSA examines

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<sup>2</sup> <https://newfarmers.usda.gov/first-steps>

<sup>3</sup> <https://www.usda.gov/partnerships/advisory-committee-on-beginning-farmers-and-ranchers#:~:text=Congress%20authorized%20the%20Committee%20in,by%20the%20Farm%20Service%20Agency.>

<sup>4</sup> Although Cooperative Extension offices receive federal funding, they also leverage funding from universities and grants, and therefore their programs are listed as specific to Cooperative Extensions.

<sup>5</sup> Targeted Funds refers to that portion of the annual allotment which is legislatively set aside for exclusive use by minority farmers, women farmers, and beginning farmers.

<sup>6</sup> <https://www.fsa.usda.gov/programs-and-services/farm-loan-programs/microloans/index>

past repayment history rather than credit scores to determine loan eligibility. While not specific to beginning farmers, programs such as the FSA's Noninsured Crop Disaster Assistance Program serves as a crucial financial safety net in the event of a natural disaster and can affect one's decision to enter farming altogether.

USDA federal grant programs are another mechanism that provide financial capital to ultimately aid in developing natural and physical capital for beginning farmers. Grants range from large scale conservation grants to fee waivers on disaster assistance programs. As of 2022 there were seven USDA grant and aid programs that target or have provisions specifically to address beginning farmers. Many of the programs focus on conservation efforts intended to create wildlife habitat and include financial incentives for transitioning land to beginning farmers. Other grant programs available work as supplemental insurance plans and offer a reduction in records required for the application and a fee waiver for beginning farmers.<sup>7</sup> Lastly, the value-added producer grants provide funds for farmers to create or develop added value to the products they produce, with a funding set aside for beginning farmers<sup>8</sup>.

Access reserves have been developed to address natural capital needs, including programs like the USDA giving priority to beginning farmers when dispersing land acquired by the FSA<sup>9</sup>. Farmland trusts and other NGOs provide access to beginning farmers in a variety of ways. Non-profit land trusts acquire land by purchasing or through donations from retiring farmers<sup>10</sup>. This land is then offered to beginning farmers for purchase, long-term lease, or easement options. Access reserves also target social capital by developing networks to link beginning and retiring farmers<sup>11</sup>. Some programs put an emphasis on developing a connection between both groups with the intent of having the retiring farmer mentor the beginning farmer purchasing the land.

In order to encourage new farmers, the USDA expanded funding opportunities to develop training specific to beginning farmers through the Beginning Farmer and Rancher Development Program (BFRDP), which targets financial, physical, human and social capital. The BFRDP operates strictly as a funder to provide one and three year grants to networks such as cooperative extension programs, tribes and non-profit community based organizations<sup>12</sup>. Organizations receive funds to train aspiring farmers in a broad range of topics with the ultimate goal of developing the tools necessary to run a successful farm operation. Training programs vary widely but business planning, marketing courses, and hands-on occupational training are dominant among BFRDP awardees (Calo 2018). The USDA supports apprenticeship and fellowship opportunities to provide access to human, social, financial and physical capital.

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<sup>7</sup> <https://www.fsa.usda.gov/programs-and-services/disaster-assistance-program/noninsured-crop-disaster-assistance/index>

<sup>8</sup> <https://www.rd.usda.gov/programs-services/business-programs/value-added-producer-grants>

<sup>9</sup> <https://newfarmers.usda.gov/access-land-and-capital>

<sup>10</sup> <https://silt.org/>

<sup>11</sup> <https://www.californiafarmlink.org/>

<sup>12</sup> <https://nifa.usda.gov/program/beginning-farmer-and-rancher-development-program-bfrdp>

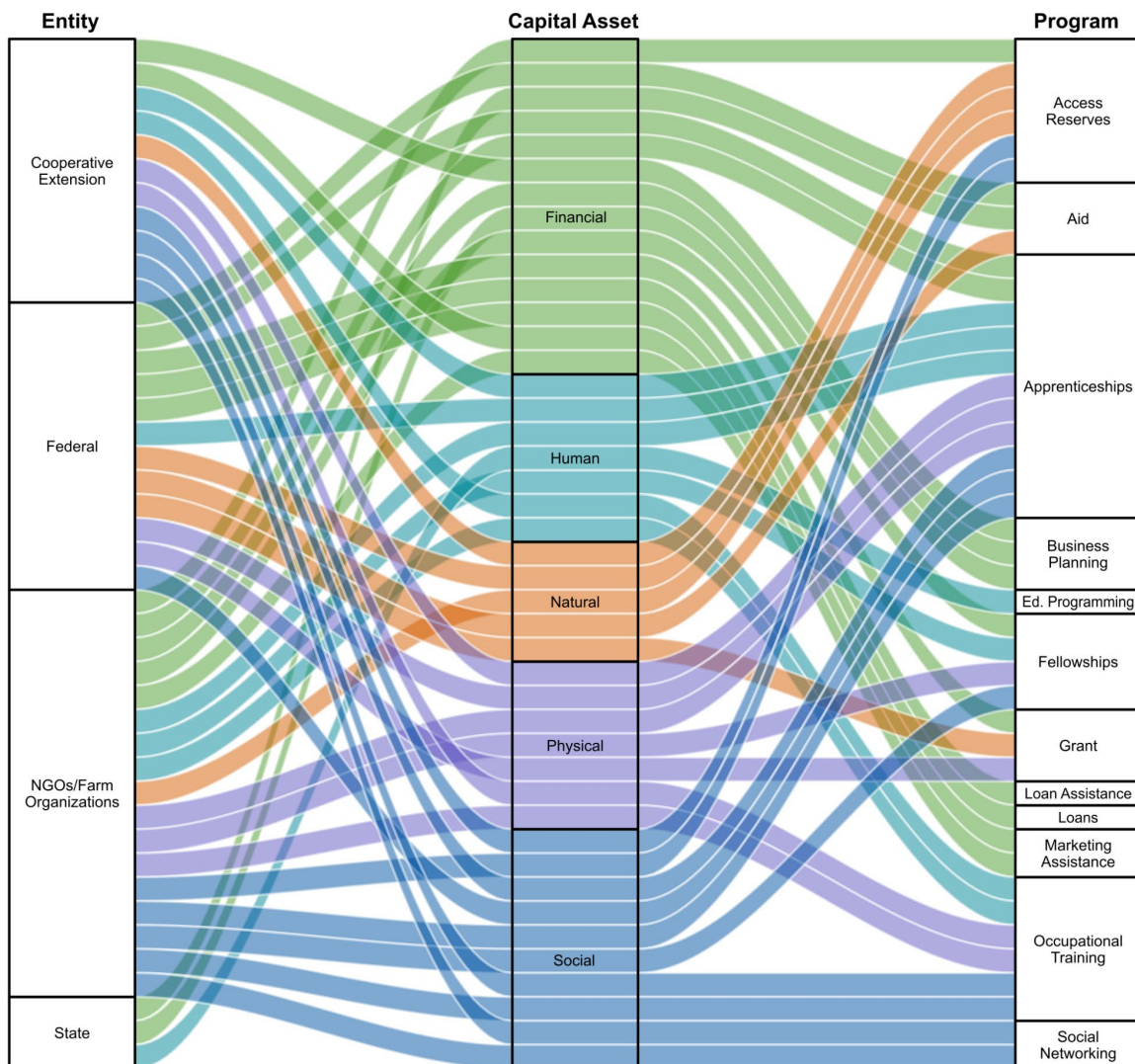


Figure 1. Alluvial diagram depicting the linkages between programs targeting beginning farmers, the capital asset they address, and the entity that developed the program. The colors of the lines demonstrate the capital asset that is being addressed with the program, with many programs addressing more than one type of asset. For example, mentoring programs exist that link beginning and retiring farmers with the intent that the beginning farmer will purchase the farmland from the retiring farmer and address both social and natural capital. The lines denote if a program exists in the US that addresses a specific asset and does not represent the overall number of programs.

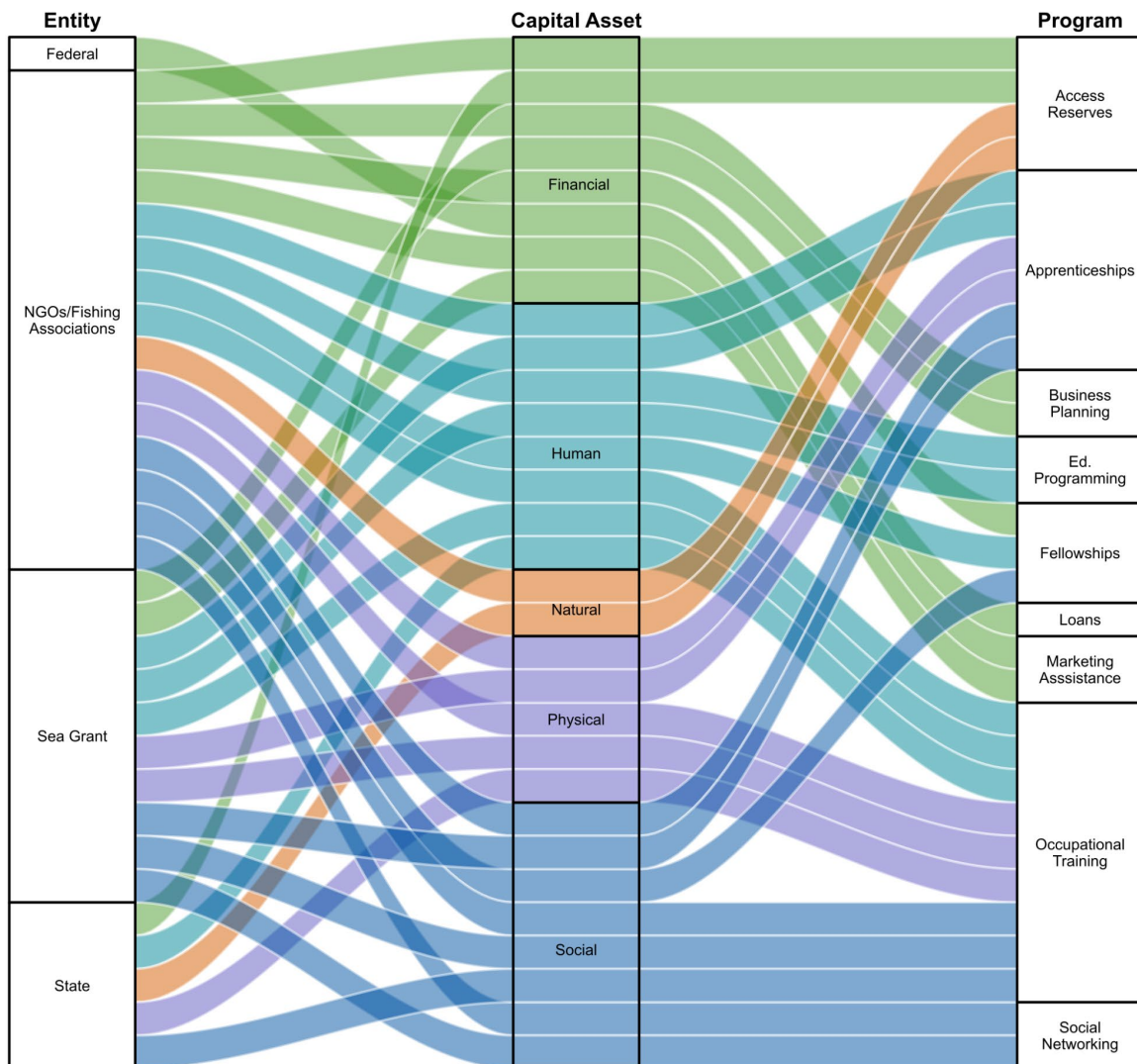


Figure 2. Alluvial diagram depicting the linkages between programs targeting new fisheries entrants, the capital asset they address, and the entity that developed the program. The colors of the lines demonstrate the capital asset that is being addressed with the program, with many programs addressing more than one type of asset. For example, quota banks provide both natural and financial capital through favorable leasing structures available specifically for new entrants that allow them to participate in fisheries at lease rates below market price. The lines denote if a program exists in the US that addresses a specific asset and does not represent the overall number of programs.

Table 2: Program types and descriptions of each for fishing and farming. Note that despite the use of a common program type groupings across the two occupations, there are differences in how the program types are described due to disparities in the level of services that are provided.

	<b>Business Planning</b>	<b>Occupational training</b>	<b>Apprenticeships</b>	<b>Social Networking</b>	<b>Loan</b>	<b>Loan Assistance</b>
<b>Fishing</b>	Business planning assistance including one-on-one consulting for business transfers	Crew training programs largely targeting labor development for existing fishing operations	Apprenticeship programs that couple new entrants with established fishermen.	Programs targeting the development of intra-generational networks amongst young fishermen	Entry-level fisheries loans for halibut/sablefish and BSAI crab quota shares.	N/A
<b>Farming</b>	Business courses provide business planning assistance that range from training in applications like Quickbooks to detailed business planning and consulting. A variety of online and material resources are also available.	Training programs available for nearly all agricultural sectors with an emphasis in developing skills required to become an owner operator.	Apprenticeship programs that couple beginning/aspiring farmers with experienced operators with many programs compensating both parties.	Networks of new and existing farmers to develop professional networks as well as support intergenerational transfer of farms and intra-generational support networks.	Robust federal loan programs that provide direct and guaranteed lending options to purchase farmland, equipment, livestock etc. Microloans are available for smaller amounts and are designed specifically for beginning farmers and other underrepresented groups.	A portion of all direct and guaranteed farm loans are set aside to be made available to beginning farmers. Down payment loan programs are only available to beginning farmers to partially finance the purchase of a farm. Tax exempt interest on farm loans in certain states known as Aggie Bonds.



Table 2 continued

	<b>Access reserves</b>	<b>Educational Programming</b>	<b>Aid</b>	<b>Grants</b>	<b>Fellowships</b>	<b>Marketing Assistance</b>
<b>Fishing</b>	Fishing associations and NGOs acquire fishing privileges that they lease to new entrant fishermen at below market rates. States have special licenses for new entrants.	Courses and trainings provide instruction on the science, regulatory, and policy processes of fisheries.	N/A	N/A	Programs targeting the development of intra-generational networks amongst young fishermen.	Marketing training included within forums and summits, online courses, and guidance literature.
<b>Farming</b>	Organizations retain farmland with the intention of leasing or selling to beginning farmers. Official networks have been created to connect beginning farmers with retiring farmers.	Courses and trainings provide instruction on the science, techniques and policy details of agricultural production.	Supplemental insurance is available to cover losses not covered under standard farm insurance programs.	Grants provide farmers with funds to implement ecologically sound practices and/or retire farmland to develop wildlife habitat as well as to add value to existing products.	Paid fellowships that support new farmers in developing a project that will benefit their farm while building a supportive peer network.	Courses and tools available to aid beginning farmers and develop marketing plans.



### 3.2.2 Programming for new fisheries entrants

In contrast to the decades-long recognition of beginning farmer issues, the aging of the fishing industry only began to get traction in the 2010s (Loring and Harrison 2013; Donkersloot and Carothers 2016). Documentation of this issue grew out of Alaska where the fishing fleet is relatively new, having been “Americanized” over the course of the 1980s after the elimination of foreign fishing vessels<sup>13</sup>. Therefore, efforts at building the next generation of fishermen lag far behind that targeting beginning farmers with a general absence of any concerted, national-level programming. The federal government directly provides only a limited loan program that addresses one capital asset - financial. Indeed, the programming targeted at addressing new entry issues in fisheries across the U.S. has been piecemeal, developed largely by NGOs, fishing associations, and regional Sea Grant offices in response to localized issues and needs. Efforts geared towards new fisheries entrants are geographically dispersed, funding opportunities are decentralized, and lessons learned are shared only through irregular, individual efforts (Calhoun et al. 2020). Furthermore, compared to diverse staff working on beginning farmer issues, Sea Grant agents work on entry issues as part of broader fisheries-related or coastal resilience work.

Similarly to Figure 1, Figure 2 demonstrates the diversity of programs that have been established, the capital assets that they address, and which entity developed them.<sup>14</sup> The programming for new fisheries entrants is dominated by those focusing on human and social capital - occupational training, apprenticeships, educational programming, fellowships, and social networking. Overall, these efforts focus on educating and training new fisheries participants and helping them foster relationships with each other and between generations. This happens through a number of diverse mechanisms including forums or summits that focus on a diversity of topics, multi-week occupational training programs for crew, apprenticeships linking multiple generations of fishermen, and fellowships with fisheries organizations.

Occupational training for crew is the most common type of new fisheries entrant program that has been developed across the U.S., with such efforts in Alaska, Washington, Oregon, California, Louisiana, the Gulf of Mexico more broadly, Georgia, Rhode Island, Maine, and Massachusetts (Calhoun et al. 2020). These programs are largely targeting a growing need in the commercial fishing industry for skilled and reliable crewmembers. Many of these programs have been developed with funding from the National Fish and Wildlife Foundation which awards matching grants utilizing federal funds. The recently enacted Young Fishermen’s Development Act (YFDA) will provide competitive funding for organizations that conduct training, education, outreach, and technical assistance initiatives for young fishermen<sup>15</sup>. This Act was developed in part in response to the exclusion of fishermen from legislation targeting beginning farmers, which increasingly includes aquaculture practitioners. However, funding for the YFDA comes from fishing citations which are subject to interannual variability and the total allocation is \$2 million, compared to \$17.5 million for BFRDP, Figure 3. The linkage between occupational training and physical capital signifies the onboard component of many of these programs, providing new entrants with the capacity to learn boating and gear usage skills. Because occupational training programs often afford the opportunity of engaging with fishing fleets, there is a linkage to social capital as well.

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<sup>13</sup> <https://www.adfg.alaska.gov/fedaidpdfs/sp05-09.pdf>

<sup>14</sup> Although regional Sea Grants receive federal funding from the National Sea Grant Program, they also leverage funding from universities and grants, making their programming specific to the regional Sea Grant office rather than a Federal entity (e.g. Alaska Sea Grant 2020).

<sup>15</sup> <https://www.congress.gov/bill/116th-congress/senate-bill/496>

Compared to agricultural programming, relatively little is being done to provide natural, physical, and financial capital opportunities for new fisheries entrants. Indeed the physical capital dimension is only ancillary to programming developed to address human and social capital, as discussed above. Programs that specifically address natural capital are access reserves that provide new entrant fishermen with access to fishing privileges. Several states have fisheries licensing programs that target new entrants, providing them with natural capital in the form of direct fisheries access. In other efforts targeting natural capital, NGOs/fishing associations in Alaska, California, Maine, and the Gulf of Mexico have purchased quota and permits that are held in accounts, known as quota and permit banks, created specifically to provide new entrants with fishing opportunities. Quota and permit banks also provide financial capital through favorable leasing structures that are intended to allow new entrants to acquire funds to purchase their own quota and permits.

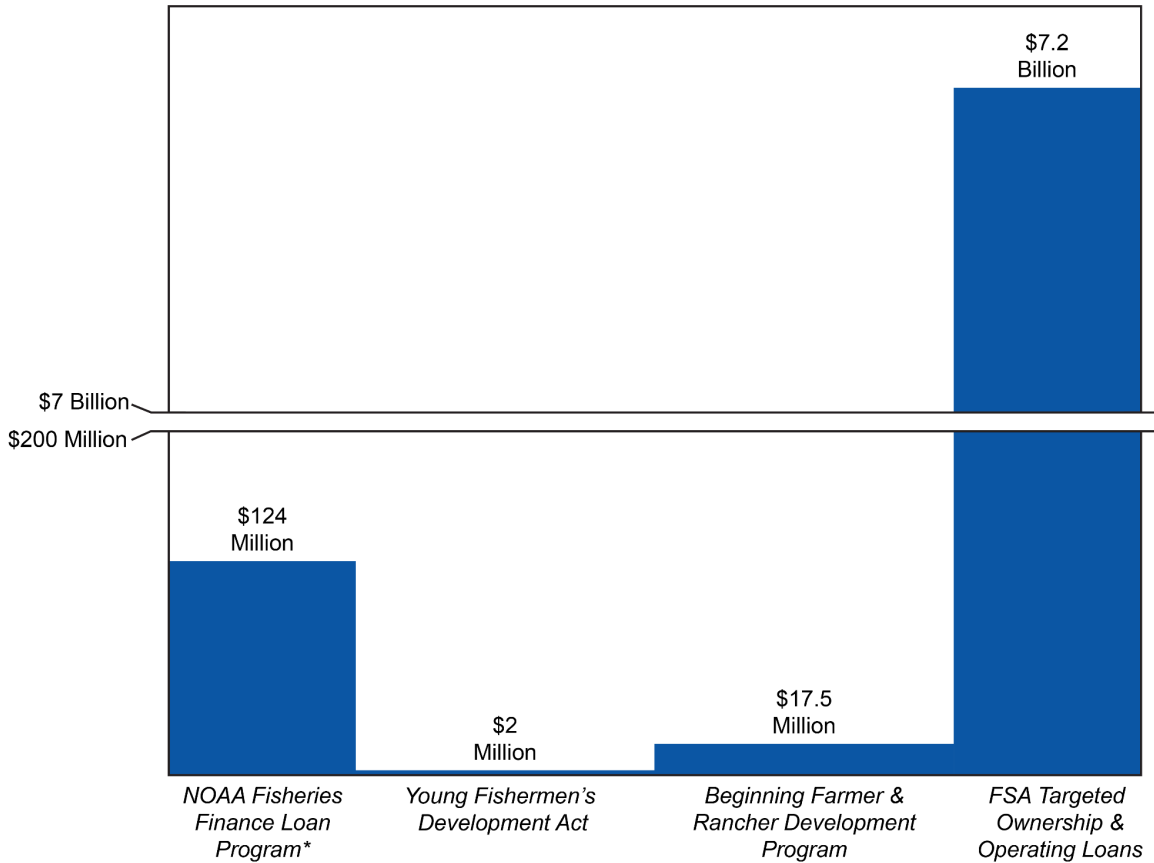
Other financial capital efforts focus on technical assistance for business planning and transfers as well as marketing. For example, new entrant programming in Alaska grew out of efforts to help retiring fishermen figure out how to transfer large fishing businesses within families and was modeled on similar issues within farming (Rice 2006). Other programs targeting business planning are one-on-one consulting or online tools for basic accounting to ensure new entrants can make loan payments and know how to get a loan<sup>16</sup>.

In stark contrast to farming, arguably the most important factor affecting the transition from crew to an owner-operator - loan access - is largely missing for new entrant commercial fishermen. The National Marine Fisheries Service established the Fisheries Finance Program with long-term fixed rate financing for the purchase of vessels, harvesting privileges in federally managed limited access fisheries, and quota shares in the Northwest halibut/sablefish and Bering Sea/Aleutian Islands crab fisheries. Only loans for halibut/sablefish quota shares have a specified entry-level component, although there are also loans available for quota shares designated for crewmembers in the Bering Sea and Aleutian Islands (BSAI) crab fisheries. In addition, the contrast between allocated funding for farming and fishing loan programs is stark - about \$7.2 billion for beginning farmers versus \$124 million for all fisheries loans, of which new fishermen are only a subset (Figure 3). While other commercial fishing loan programs have been established by States (including Alaska, Rhode Island, New Jersey, and Massachusetts), Community Development Financial Institutions (Maine and California), and cooperatives (Alaska), these programs do not have a specific entry-level component and have State-specific residency requirements.

Whole categories of programs that are available to new farmers are completely missing from programming that has been developed for fishermen. Instead of the federally-backed aid programs, fishermen can sometimes access disaster relief funding but only if losses over 35% can be documented for their relevant fishery and frequently with multi-year time lags in funding distribution (Bellquist et al. 2021). In addition, there are no federal fishing insurance programs akin to farming crop insurance that ensure fishermen attain certain income levels. The lack of such programs would meaningfully alter entry incentives into fishing similarly to farming.

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<sup>16</sup> <http://fishbiz.seagrant.uaf.edu/>



*\*Not specific to new entrants*

Figure 3. Federal programs for new fishermen and farmers and their 2021 total funds. The break in the y-axis denotes the change in scale between the two distinct value ranges.

#### 4. Conclusions and recommendations

Access to both farming and fishing for the next generation is largely constrained by costs of physical capital that have resulted from government policies, technological improvements, and broader socio-cultural transformations. These fundamental cost issues are coupled with the disintegration of learning opportunities as well as social relations and values around fishing and farming that have caused intergenerational conflict and strife in rural communities where often few alternative employment opportunities exist. This has compounded rural out migration patterns that began decades ago, reducing the potential pool of participants for both occupations and the capacity for a new generation to take over.

Fisheries programming for new entrants lags far behind what has been established for farming due to the piecemeal nature of efforts in the former and lack of national-level initiatives in attenuating the situation for fishermen. The sheer scale, depth, and breadth of programming for beginning farmers makes the comparison to new fisheries entrant programs stark. Yet the lack of a new generation of fishermen poses similar risks to national food security and should be treated with similar urgency. Ignoring this problem into the future may result in unprecedented challenges for finding the next generation of fishermen that is ready and capable of fishing national waters.

Following our research results, and considering the disproportionate degree of programming available for beginning farmers relative to new fisheries entrants, we posit the following recommendations to improve programming for new fishermen:

- **Develop a national census for fisheries participants.** At present there is no comprehensive, national data collected on fishermen, limiting our ability to understand and identify new entrants and their demographics, their geographic scope across US fisheries and the issues that they face. Similarly to the Census of Agriculture, a comprehensive data collection is necessary to understand the capacity and needs of young fishermen across all five capital assets. A clearinghouse equivalent to the Census of Agriculture would be inclusive of fishing capital use and ownership, demographic characteristics of operators, production practices, and income and expenditures.
- **Develop a program that directly targets new entry issues comparable to the BFRDP.** National-level recognition of the new entrant problem in farming has led to legislation with associated funding, staffing, and umbrella initiatives that have all flowed into regional efforts with locally-relevant programming. There is nothing remotely comparable in fishing, where fishing associations, NGOs, and Sea Grant have tried to address the gap in various disparate, micro-level programs that address a singular capital asset at a very localized scale due to the lack of coordination, guaranteed funding, and sharing of lessons learned that could be afforded by national-level umbrella programming. Furthermore, the YFDA's reliance on fees collected from illegal fishing to support fishermen training programs may ultimately undermine its consistency and longevity. The development of a program comparable to the BFRDP for new fisheries entrants will serve as a central body of information and congressionally mandated funding that fishing associations and NGOs can use to build regionally and locally relevant programming to continue to target human and social capital while providing access to physical capital. Similarly to the BRFDP, the program should include regular programmatic reviews to assess and share lessons learned across the nation.
- **Implement federal fisheries insurance programs inclusive of diverse target fisheries.** Federal farm insurance programs have evolved towards inclusivity of small-scale agricultural production, mitigating the financial risk of farmers. Comparatively, fishermen face multi-year lags in fishery disaster compensation that is no way guaranteed. To buffer substantial interannual income variability and provide financial capital assistance, federal fisheries insurance programs should be developed that include small-scale State fisheries.
- **Develop comprehensive low-interest loan programs modeled after the FSA loan programs.** Despite evidence of entrenched financial issues around entry into fishing and farming, much of the programming targeting facilitating that entry in fisheries focuses on developing human and social capital through training and educational programs. To make new fisheries entrant initiatives aligned with those that exist for new farmers, congressionally-funded low-interest loan programs should be developed for young fishermen that target building financial capital and access to diverse fisheries. Furthermore, similarly to the FSA loan programs, these fisheries loans programs should holistically examine prospective fisheries entrants in terms of their capacity to repay loans and mitigate the need for credit or collateral.

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