3-2016

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Research Paper #337
December 2017

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International Journal of Open Governments/Revue Internationale des Gouvernements Ouverts, Vol. 3, 2016

Revue Internationale des Gouvernements Ouverts, Vol. 3 (2016)

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Environmental protection and natural resource management are highly complicated, dynamic processes intersecting natural and social systems. Policies related to these issues involve a broad array of inputs including, among others, scientific data, legal information, value judgments, philosophical perspectives and economic decisions, and they can have momentous consequences not only at international, national and state levels, but also for communities and individuals. In recognition of these impacts, policy and lawmakers in 50+ countries are pursuing community-based approaches to environmental protection and natural resource management by delegating some degree of management and decision-making authority over parks or other protected areas; forests; water, coastal resources, and fisheries; wildlife; and other natural resources to community user groups.[2] (#_ftn2)

One framework for promoting citizen participation in the management of public natural resources is the Community-Based Natural Resource Management Model (CBNRM). This model adopts a socio-ecological approach that integrates local institutions, customary practices, and community knowledge structures into natural adaptive systems protection and administration. It is believed that consideration of these factors and that involvement of local stakeholders in management, regulatory, and enforcement processes will result in improved resource management outcomes.[3] (#_ftn3)

This paper will briefly describe the CBNRM model and will review its use in relation to various levels and categories of legal obligations in two very different contexts. It also will consider barriers that have been identified to citizen participation in these CBNRM models and will explore how law or other instruments might be utilized to respond to these challenges.[4] (#_ftn4)

§ 1 – The Model

Community-Based Natural Resource Management is a very flexible management approach. Under the model, the state retains primary ownership of the land or other resource, and it also retains some form of management authority.[5] (#_ftn5) Local communities in CBNRM projects assume legal obligations and obtain rights or privileges to use and benefit from environmental or natural resources in a defined area [6] (#_ftn6) By incentivizing stakeholder populations to sustainably manage the relevant resource and by leveraging that population's local expertise about natural and social conditions, the CBNRM approach seeks to improve environmental and socioeconomic outcomes.[7] (#_ftn7)

CBNRM programs are designed and implemented in their own cultural contexts, and they can take multiple forms. There are, however, several elements that frequently appear to be present in successful programs. For example, researchers agree that most effective collaborative schemes have clearly defined communities of users and resource systems.[8] (#_ftn8) These elements ensures that those who bear the cost of the program receive its benefits. Relatedly, in successful CBNRM ventures, external governmental entities recognize the rights or interests of community users in the resource,[9] (#_ftn9) and community rules require an equitable alignment of user costs and benefits.[10] (#_ftn10)
Monitoring, proportional sanctions, and low-cost dispute resolution are other features commonly found in the rules of productive CBNRM programs, as are rules: (1) that have been developed by or in collaboration with the community, (2) that are based upon local conditions, and (3) that are flexible and incorporate procedures for future modifications.[11] (#_ftn11) Sufficient external support, whether financial or administrative, governmental or non-governmental, is another important factor. [12] (#_ftn12

Not all prosperous CBNRM programs will be based upon these design elements, and, concomitantly failing projects may feature many of these components. However, a combination of these organizational characteristics appears to typify robust institutions for managing common-pool resources.[13] (#_ftn13)

§ 2 – Examples

CBRNM sites are located throughout the world, and the model's principles have been applied across a broad range of natural resources and communities. The following two examples demonstrate its flexibility and its potential for improving the quality and effectiveness of citizen participation in environmental and natural resource management.

A) CITES and Wildlife in Namibia

The Republic of Namibia is a sparsely populated country situated along the south Atlantic coast of Africa.[14] (#_ftn14) It is a member of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the international convention designed to ensure that international trade does not threaten the sustainability of listed wild animals and plant species.[15] (#_ftn15)
After gaining its independence in the early 1990's, the new Namibian government was confronted with the monumental task of promoting social development and economic growth while preserving the nation's rapidly disappearing wildlife resources. Because hunting prohibitions had been inadequately enforced, impoverished Namibians reportedly had hunted wildlife illegally on communal lands and cooperated with commercial poachers.[16] (#_ftn16) These conditions resulted in the decimation of a number of species in the country, including black rhinos, elephants, zebras, and lions; one source estimates that wildlife populations in northern Namibia may have been reduced by up to 90%.[17] (#_ftn17)
Consistent with its obligations under CITES and its goals to promote both sustainable economic and wildlife resource development, the Namibian government enacted the Nature Conservation Amendment Act of 1996 (1996 Act) authorizing any group of people residing on communal land to apply for

conservancy status.[18] (#_ftn18) Legal conservancies must have a defined membership with a representative management committee, a defined border, and a legally-enforceable constitution that provides for a wildlife management strategy and an equitable distribution of benefits.[19] (#_ftn19) The Ministry of Environment and Tourism (MET) has the discretion to recognize a conservancy, subject to any conditions, and to withdraw or amend that recognition at any time. Recognized conservancies have the right to hunt, capture, cull, and sell "huntable" game and may apply to the MET for permits to use protected game quotas for trophy hunting.[20] (#_ftn20)

As of 2014, there were 82 registered conservancies, impacting approximately 177,435 people and covering an estimated 20% of Namibia's land mass.[21] (#_ftn21) There are similar community associations operating in a Namibian national park and in over 30 community forests.[22] (#_ftn22) Advocates of Nambia's conservancy programs proudly note that the 1996 Act's legislative framework "devolves 100% of the benefits from the sustainable use of wildlife to resident communities … and recognizes the conservancy as the legitimate manager and beneficiary of both consumptive and non-consumptive commercial forms of wildlife use."[23] (#_ftn23) These benefits purportedly advance sustainability goals by improving the competitiveness of wildlife vis-à-vis agriculture as a land-use and by creating legal incentives for communities to conserve wildlife.[24] (#_ftn24) Conservancy monitoring systems report that poaching has decreased;[25] (#_ftn25) Namibian elephant populations increased from approximately 5,000 to 16,000 from 1984 to 2008,[26] (#_ftn26) and other wildlife species have experienced similarly impressive population increases.[27] (#_ftn27) The recovery of conservancy wildlife stocks has stimulated private sector investment in the conservancies in the form of trophy hunting and wildlife harvesting as well as tourism lodges and camps, often the result of joint ventures between investors and conservancies.[28] (#_ftn28)

Citizen participation in the conservancies produce benefits for users beyond the economic and environmental. Members develop administrative, dispute resolution, management, and leadership competencies; expand their social networks; and generally enhance social capital.[29] (#_ftn29) Namibian conservancies are responding to gender equity issues: women purportedly are active participants on conservancy committees and in management positions in registered conservancies. Conservancies are leveraging their financial, physical, and human resources for rural development activities such as local education, water supply, and public health. While some have noted program shortcomings,[30] (#_ftn30) most agree that Namibia's conservancy program is a successful example of CBNRM.

B) The Magnuson-Stevens Act and the U.S. Atlantic Cod Fishery

The New England coast of the U.S. is home to the Atlantic cod fishery, once one of the most productive fishing grounds for this fish in the world.[31] (#_ftn31) Stocks collapsed in the 1990's due to overfishing and they are still dangerously in decline.[32] (#_ftn32) Commercial and recreational fishing interests, politicians and regulators, the environmental community, and the general public all have a stake in this fishery and have opinions about how best to respond to the crisis.

All US fisheries are subject to overlapping layers of legal authority. At the national level,[33] (#_ftn33) the 1976 Magnuson Fisheries Conservation and Management Act (Magnuson Act)[34] (#_ftn34) and its reauthorizing legislation, the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-

Stevens Act), also referred to as the MSA or the Sustainable Fisheries Act, establish exclusive federa authority over fisheries from three miles to two hundred miles offshore.[35] (#_ftn35) The Magnuson Ac was promulgated initially to respond to foreign fishing by promoting the development of a domestic flee and to involve local fishing communities in the management process; the reauthorized Magnuson-Stevens Act also incorporates conservation goals for all US fisheries, including stock recovery provisions such as annual catch limits, accountability measures, and possible essential fish habitat (EFH) designations.[36] (#_ftn36)

The National Marine Fisheries Service (NOAA Fisheries) shares federal responsibility for fisheries with eight regional councils,[37] (#_ftn37) including the New England Fishery Management Counci (NEFMC). NEFMC has management authority over the Atlantic cod fishery and is required by the Magnuson-Stevens Act to formulate a Fishery Management Plan (FMP) for relevant stock. Its Northeas Multispecies (Groundfish) FMP establishes management measures for thirteen groundfish species including the Atlantic cod.[38] (#_ftn38) Early plans failed to reverse the cod crisis.

In 2003, in an effort to experiment with alternative conservation models, the NEFMC advanced one proposal, Amendment 13,[39] (#_ftn39) to the Northeast Multispecies FMP. This proposal, among other things, created a CBNRM-like trial program that allowed fishermen to organize and manage their own "sectors." Sectors received a prescribed allocation of the fishery's quota based upon their fishing history a fundamental shift of approach from a management regime based primarily upon input controls such as area closures, vessel and gear restrictions, and limits on "days at seas."[40] (#_ftn40) The trial was deemed a success, and, in 2010, the sector approach was expanded and formalized in Amendment 16 [41] (#_ftn41)

Each approved sector develops a binding Operations Plan and a Sector Contract with compliance plans for quotas and conservation measures. NOAA Fisheries must approve the Operations Plan, and all sector members must execute the Sector Contract.[42] (#_ftn42) If a sector complies with its quota, its future annual catch limit will not be reduced even if the general fishery exceeds its target fishing allocation.[43] (#_ftn43) Sector members may trade or lease their stock allocations through their sector managers.[44] (#_ftn44) Catch and other compliance measures are monitored.[45] (#_ftn45)

Despite the tremendous shift in operating culture that it represents, the region's fishing community appears to be adapting to the sector approach. NOAA Fisheries reports that sectors catch nearly 98% of the groundfish harvest.[46] (#_ftn46) Within the sector system, members have much more flexibility to manage their fishing. For example, they are not limited to days at sea or number of trips, and they can freely trade quota.[47] (#_ftn47) They also can decide when to fish, allowing them to time the market better, and sectors have begun to directly contract with large retailers. Boat size is no longer as much of a factor, and sectors members are consolidating vessels and saving fuel. Economically, data for the 2010 fishing season indicate that, while gross revenues for groundfish in the fishery were down $1.8 million compared 2009, total revenues increased $26.6 million.[48] (#_ftn48)

Additionally, while reductions in catch limits certainly are a primary factory, sectors appear to be assimilating the conservation goals of the program. It is reported that no sector exceeded its quota in the first year of the sector program.[49] (#_ftn49) Because sector fish are no longer common pool resources, sector members have a conservation incentive to, for example, invest in gear that reduces habitat destruction and improves

sustainability.[50] (#_ftn50) Additionally, where before there was a strong history of antagonism betwee fishing communities and scientists, academics, conservationists, and non-profits, sector members have bee incentivized due to severe financial constraints to collaborate with these groups to transition administrativ and operating practices and to monitor compliance and stock levels.[51] (#_ftn51) These collaborations hav built stronger, more resilient trust relationships, and the industry now has a more active role in the collectio and evaluation of data used for regulatory purposes.

Yet it appears that NOAA Fisheries may have implemented its innovations too late in the Atlantic co fishery's decline to make a real difference in species recovery. Despite gains in domestic fish stoc sustainability overall, the acting US Secretary of Commerce declared a commercial fishery failure for th Northeast Multispecies (Groundfish) Fishery for the 2013 fishing season, and, in that year, cod catch an price decreases contributed to a 66.2% decline in revenue.[52] (#_ftn52) In 2014, NOAA Fisherie scientists reported that New England cod stock dropped to all-time record low levels, with a populatio at only 3-4% of sustainable yield.[53] (#_ftn53) Overfishing is not the only cause of this decline pollution, construction activities, and the rapid warming of waters of the New England coast all hav been identified as factors in the collapse.[54] (#_ftn54) Fishery stakeholders are confronting monumenta challenges, but, from a CBNRM programmatic perspective, sector "community user groups" in the US Atlantic cod fishery advocating for management approaches that continue to weaken or decrease stock clearly are failing to improve resource management outcomes, a primary objective of the CBNRM framework.

§ 3 – Barriers to Citizen Participation in CBNRM and Possible Legal Interventions

CBNRM has the potential to increase citizen participation in environmental and natural resourc management, strengthening the democratic process. However, as the two examples discussed abov demonstrate, there are unique challenges to involving citizens in programs that govern highly technical multidimensional ecological systems. Further, each CBNRM project confronts a distinct set of concern based upon idiosyncratic historical and sociocultural contexts.[55] (#_ftn55)

The contextual distinctions between the Namibian wildlife and the US Atlantic cod fishery CBNRM example are evident. While both programs manage "mobile or fugitive resources … [that require] coordination acros multiple administrative units,"[56] (#_ftn56) the profiles of the user communities and their managemen challenges are vastly different.

Many Namibian conservancies, for example, encompass one or more distinct traditional communities Traditional authorities in these communities still exercise extensive authority, and community member adhere to customary roles. Accordingly, while data report that women are well represented amon conservancy staffs, these staff jobs are typically aligned with culturally-ascribed gender activities such a cleaning and cooking.[57] (#_ftn57) CBNRM programs may encourage women and other marginalize community members to enroll in conservancies, but, without addressing existing power hierarchies, thes members are likely to feel disempowered.[58] (#_ftn58) More generally, low literacy rates are a significant barrier to conservancy participation, either economically or managerially.

This compromises the "defined community of users" design factor that appears to be an important feature o successful CBNRM programs, as well as several other of those characteristics. If the Namibian governmen

privileges traditional male leaders, women and other marginalized individuals may decide that their costs to participate in the program are greater than any benefit they may derive and will withdraw their support for, or contributions to, the program.

Law can mandate transparency, accountability, and non-discrimination, but it will not immediately reverse historical community socio-cultural norms and traditions. Properly designed, however, legal interventions may have the power: (1) to authorize or expand access to education and skills/technical training; (2) to provide financing for economic and social capital development to marginalized conservancy members as a path to influence in conservancy management; and (3) to legislate minimum committee membership allocations, voting requirements, and flexible work scheduling.

Contrast the Namibian conservancy experiences with that of the sectors in the Northeastern US fishery. Sector members primarily are literate business owners or employees with verifiable experience in the Atlantic cod fishery. Because all members are jointly liable for compliance with the sector's annual catch limit, most sectors formed along social or cultural lines and are geographically based; sectors may be further identified by gear type or by affiliation with an industry group.[59] (#_ftn59) While these citizens have operated largely independently in the fishery, and they may have found it more difficult to transition to collaborative management,[60] (#_ftn60) they have strong social networks. Network norms and other elements of social capital likely facilitated their participation in the sector program.[61] (#_ftn61)

Yet the cod population is still crashing in the NEFCM region. While there are multiple factors affecting cod stocks, many of the characteristics present in successful CBNRM programs also appear to be lacking in the NEFMC sector program, potentially with negative impacts on program outcomes. For example, many contend that the defined community in the sector system excludes a number of important users including important recreational interests, and that it allocates benefits unevenly.[62] (#_ftn62) Further, the costs of participation in the program may be disproportional to the benefits for many users. Finally, in this instance, the government appears to have all but ceded management control to sector interests potentially sacrificing long-term stock recovery for short-term economic motivations.

Even had all of the design features of a successful CBNRM program been present, however, a legally enforceable model may, regrettably, have been proposed and implemented at a point in the US Atlantic fishery when the cod population may be beyond recovery.

Conclusion

The CBNRM model has the potential to increase citizen participation in decisions that impact natural systems. Natural resource and environmental management choices encompass a wide range of considerations, including natural, social, political sciences, economics, cultural and other contextual influences, and they must be made in the presence of risk and uncertainty. The first-hand ecological knowledge of local resource users can be an invaluable component of decisions about resource administration, and it can illuminate existing scientific data and guide future research efforts.[63] (#_ftn63)

However, in order for their participation to be meaningful, individuals must have, or must develop, the skills to engage in an effective, empowered, and timely way. While not a panacea, law can play a critical role in promoting the conditions in which citizens can acquire such skills and authority. Further, law can

structure and adapt public participation to accommodate a CBNRM program's cultural context, politica and economic environment, resource type, or ecological setting.

In addition to encouraging citizen participation in environmental protection and natural resourc decision-making, laws promoting CBNRM should also be crafted so as to achieve the framework's othe primary objective, to improve resource management outcomes. Those who have the authority anc capacity to participate must be accountable for its exercise; the law must improve accountability anc transparency, at all levels of governance.

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[1] (#_ftnref1) Contact: jacobs@utk.edu

[2] (#_ftnref2) Derek Armitage, Adaptive Capacity and Community-Based Natural Resource Management, 35 Envtl. Mgmt. 703, 40 (2005), available at http://link.springer.com/article/10.1007/s00267-004-0076-z/fulltext.html.

[3] (#_ftnref3) Id.

[4] (#_ftnref4) This paper supports and complements the thesis set forth in the article submitted by Wendy E. Wagner for this symposium The Missing Link in Citizen Participation in U.S. Administrative Process. In her article, Professor Wagner argues that there is "a disconnec between the procedural means of ensuring participation and the end goal of engaging affected groups in US administrative process." (Emphasis omitted). The CBNRM is a one alternative for engaging affected groups in both the administrative and the managemen processes.

[5] (#_ftnref5) Ctr. for Int'l Envtl. Law et al., Whose Resources? Whose Common Good? Towards a New Paradigm o Environmental Justice and the National Interest in Indonesia 2, 9-10, 14 (Jan. 2002), available at http:/ www.ciel.org/Publications/Whose_Resources_3-27-02.pdf.

[6] (#_ftnref6) Whose Resources?, supra note 5, at 2.

[7] (#_ftnref7) See, e.g., Elizabeth Burleson & Diana Pei Wu, Non-State Actor Access and Influence in International Legal and Policy Negotiations, 21 Fordham Envtl. L. Rev. 193, 201-03 (2010).

[8] (#_ftnref8) Michael Cox, Gwen Arnold & Sergio Villamayor Tomás, A Review of Design Principles for Community-based Natura Resource Management, 15 Ecology & Soc'y 38 (2010).

[9] (#_ftnref9) Id.

[10] (#_ftnref10) Id.

[11] (#_ftnref11) Id.

[12] (#_ftnref12) Stefan Carpenter, The Devolution of Conservation: Why CITES Must Embrace Community-Based Resource Management 2 Ariz. J. Envtl. L. & Pol'y 1, 17 (2011). See also infra § 3. When external governmental support is viewed as control or imposition however, it can disincentivize the target communities. See Thomas G. Measham & Jared Lumbasi, Success Factors for Community-Base Natural Resource Management (CBNRM): Lessons from Kenya and Australia, 52 Envtl. Mgmt. 1, 2 (2013). Further, user communities ar also subject to leadership failures and negative political dynamics. See id. These and other issues have subjected CBNRM principles t critical scrutiny. See, e.g., Stephen Turner, A Crisis in CBNRM? Affirming the Commons in Southern Africa, 10th IASCP Conference Oaxaca, Mexico, available at: http://dlc.dlib.indiana.edu/archive/00001501/00/Turner_Crisis_040508_Paper361.pdf. Even critical commentators opine, however, that th model's philosophy is sound and that CBNRM programs should perform well under the right circumstances. Measham & Lumbasi, supra.

[13] (#_ftnref13) See Elinor Ostrom, Governing the Commons: The Evolution of Institutions for Collective Action 30 (1990).

[14] (#_ftnref14) Overview, Government of Namibia, http://www.gov.na/about-namibia.

[15] (#_ftnref15) What is Cites?, Cites: The Convention on International Trade in Endangered Species of Wild Fauna and Flora https://www.cites.org/eng/disc/what.php. There currently are 181 State Parties to CITES; Namibia became a Party in 1990. See List o Contracting Parties, https://www.cites.org/eng/disc/parties/chronolo.php.

[16] (#_ftnref16) Carpenter, supra note 12, at 16.

[17] (#_ftnref17) Id. (citations omitted).

[18] (#_ftnref18) Nature Conservation Amendment Act (1996).

[19] (#_ftnref19) Id. at § 3. See also Karol Boudreaux, A New Call of the Wild: Community-Based Natural Resource Management i Namibia, 20 Geo. Int'l Envtl. L. Rev. 297, 304-05 (2008).

[20] (#_ftnref20) Carpenter, supra note 12, at 24-25.

[21] (#_ftnref21) Summary of Conservancies,

http://www.nacso.org.na/SOC_profiles/conservancysummary.php. This figure is likely underreported as it represents data from only 79 o the 82 conservancies. Id.

[22] (#_ftnref22) Elephants Don't Like Coke or Fanta, What's New, Namibian Association of CBNRM Support Organisations http://www.nacso.org.na/index.php.

[23] (#_ftnref23) L. Chris Weaver, Elly Hamunyela, Richard Diggle, Greenwell Matongo & Theunis Pietersen, The Catalytic Role an Contributions of Sustainable Wildlife Use to the Namibia CBNRM Programme, CITES and CBNRM - Proceedings of an International Symposium on "The Relevance of CBNRM to the Conservation and Sustainable Use of CITES-Listed Species in Exporting Countries" 59 61 (ICUN Max Abensperg-Traun, Dilys Roe & Colman O'Criodain eds. 2011) (CITES and CBNRM). This author takes no position in th debate regarding sustainable extractive uses of wildlife. Many have fundamental ethical objections to hunting or to any other extractiv practices that they designate as exploitative. Proponents contend that these objections are related more to "western cultural sensitivitie surrounding the welfare of charismatic animals" than to conservation values. Id. at 137.

[24] (#_ftnref24) Id. at 61.

[25] (#_ftnref25) Id. at 61 n.3.

[26] (#_ftnref26) Carpenter, supra note 12, at 28.

[27] (#_ftnref27) Id.

[28] (#_ftnref28) Id. at 27. Investors and commercial hunting operators often include conservation and social empowerment clauses in thei contracts with the conservancies that incentivize long-term maintenance of wildlife populations and critical habitats. See CITES and CBNRM, supra note 23, at 63.

[29] (#_ftnref29) Id.

[30] (#_ftnref30) For example, Article 21(g) of the Namibian Constitution guarantees citizens the right to "move freely throughou Namibia[,]" preventing the exclusion of non-members from conservancy lands. NAMIB. CONST. art. 21(g). There also are uncertaintie pertaining to customary land rights within conservancies. See Boudreaux, supra note 19, at 322-24.

[31] (#_ftnref31) Georges Bank, Atlantic, Places in the Sea,

https://marine-conservation.org/media/shining_sea/place_atlantic_georges.htm.

[32] (#_ftnref32) André Verani, Community-Based Management of Atlantic Cod by the Georges Bank Hook Sector: Is It a Model Fishery? 20 Tul. Envtl. L.J. 359, 361-65 (2007).

[33] (#_ftnref33) While beyond the scope of this short article, international law also has played a role in the allocation of fishery resources i Georges Bank. See Delimitation of the Maritime Boundary in the Gulf of Maine Area (U.S. v. Can.), 1984 I.C.J. 246 (Oct. 12).

[34] (#_ftnref34) 16 U.S.C. §§ 1801-1882 (1988).

[35] (#_ftnref35) 16 U.S.C. §§ 1801-1891 (2012). The reauthorization of the Magnuson-Stevens Act is currently being considered in the U.S Congress. H.R. 1335 – 114th Congress: Strengthening Fishing Communities and Increasing Flexibility in Fisheries Management Act https://www.govtrack.us/congress/bills/114/hr1335.

[36] (#_ftnref36) See Verani, supra note 32, at 366-67. See generally Peter Shelley, Taking Stock: The Magnuson-Stevens Act Revisited Have the Managers Finally Gotten it Right?: Federal Groundfish Management in New England, 17 Roger Wms. L. Rev. 21, 30, (2012).

[37] (#_ftnref37) NOAA Fisheries is a division of NOAA, the National Oceanic and Atmospheric Administration, an agency of the Department of Commerce. See Verani, supra note 32, at 365.

[38] (#_ftnref38) New England Fishery Mgmt. Council, U.S. Dep't of Commerce, Northeast Multispecies Fishery Management Plan, http://s3.amazonaws.com/nefmc.org/MultiSpecies-FMP.pdf.

[39] (#_ftnref39) Amendment 13, New England Fishery Mgmt. Council, U.S. Dep't of Commerce, Northeast Multispecies Fishery Management Plan,

http://s3.amazonaws.com/nefmc.org/Final-Amendment-13-SEISVol.-I-II.pdf.

The Conservation Law Foundation and other organizations successfully filed suit against NOAA Fisheries challenging Amendment 13 on conservation-related grounds. See Conservation Law Found. v. Evans, 209 F. Supp. 2d 1, 15 (D.C. Cir. 2001). A discussion of the challenges to Amendment 13 exceeds the scope of this article.

[40] (#_ftnref40) See Roger Fleming et al., Twenty-Eight Years and Counting: Can the Magnuson-Stevens Act Deliver on Its Conservation Promise?, 28 Vt. L. Rev. 579, 602 (2004).

[41] (#_ftnref41) Amendment 16, New England Fishery Mgmt. Council, U.S. Dep't of Commerce, Northeast Multispecies Fishery Management Plan,

http://s3.amazonaws.com/nefmc.org/091016_Final_Amendment_16.pdf. Amendment 16 was also challenged in court. Oceana, Inc. v Locke, 831 F. Supp. 2d 95, 121 (D.C. Cir. 2011). See also Shelley, supra note 36.

[42] (#_ftnref42) See, e.g., 50 C.F.R. § 648.87.

[43] (#_ftnref43) Fleming et al., supra note 40, at 618.

[44] (#_ftnref44) Jonathan M. Labaree, Sector Management in New England's Groundfish Fishery: Dramatic Change Spurs Innovation, Gulf of Maine Research Institute 2012,

http://www.gmri.org/sites/default/files/resource/sector_management_in_new_england.pdf.

[45] (#_ftnref45) Compliance is monitored with reports from seafood dealers, with dockside and at-sea monitors, and by fish trades amongst sectors Id. Vessels also are required to maintain an operational Vessel Monitoring System. See, e.g., 50 C.F.R. § 648.85(a)(3)(i); § 648.10.

[46] (#_ftnref46) 75 Fed. Reg. at 18,114.

[47] (#_ftnref47) Labaree, supra note 44, at 6.

[48] (#_ftnref48) See Shelley, supra note 36, at 57.

[49] (#_ftnref49) Shannon Carroll, Sector Allocation: A Misguided Solution, 17 Ocean & Coastal L.J. 163, 188 (2011).

[50] (#_ftnref50) Id. at 12. Labaree, supra note 44, at 6.

[51] (#_ftnref51) See, e.g., Rachel Gallant Feeney, Kenneth J. La Valley & Madeleine Hall-Arber, Assessing Stakeholder Perspectives on the Impacts of a Decade of Collaborative Fisheries Research in the Gulf of Maine and Georges Bank, Marine & Coastal Fisheries: Dynamics Mgmt. & Ecosystem Science 2, 205–216 (2010).

[52] (#_ftnref52) Harold F. Upton, Cong. Research Serv., RL34209, Commercial Fishery Disaster Assistance (2013) https://www.fas.org/sgp/crs/misc/RL34209.pdf; 2013 Final Report on the Performance of the Northeast Multispecies (Groundfish) Fishery [May 2013 – April 2014] 22 (2nd Ed. Sept. 2015) (2013 Final Report), Northeast Fisheries Science Center Reference Document 15-02, http://www.nefsc.noaa.gov/publications/crd/crd1502/crd1502-2nd-edition.pdf.

[53] (#_ftnref53) Statement by John Bullard, Regional Administrator, Greater Atlantic Region, On Gulf of Maine and Haddock Interim and Emergency Actions, NOAA Fisheries (Nov. 10, 2014), http://bloximages.chicago2.vip.townnews.com/gloucestertimes.com/content/tncms/assets/v3/editorial/6/ad/6ad9a8ae-691a-11e4-ab67-6b894b7a21e6/5461249c40e50.pdf.pdf. Despite these dire data, regulators actually proposed reducing at-sea monitoring requirements in the Northeast Fisheries Observer Program in 2016. See Prop. NOAA Northeast Multispecies (Groundfish) FMP Framework Adjustment 55, 50 C.F.R. § 648, 81 Fed. Reg. 15003, 15015-19, 15025-26, 15032-15033 (Mar. 21, 2016), https://www.gpo.gov/fdsys/pkg/FR-2016-03-21/pdf/2016-06186.pdf. The proposal would drop monitoring levels from 24% of trips to 14% at a time when the cod fishery appears to be nearing collapse, ostensibly to relieve the financial burden on groundfish fishermen.

[54] (#_ftnref54) See Shelley, supra note 36, at 70-72. See also Andrew J. Pershing, et al., Slow Adaptation in the Face of Rapid Warming Leads to Collapse of the Gulf of Maine Cod Fishery, 350 Science 809 (2015).

[55] (#_ftnref55) Julia Olson & Patricia Pinto Da Silva, Changing Boundaries and Institutions in Environmental Governance: Perspectives on Sector Management of the Northeast U.S. Groundfish Fishery, 13 Maritime Studies 1, 4 (2014).

[56] (#_ftnref56) Elizabeth Burleson & Diana Pei Wu, supra note 7, at 202.

[57] (#_ftnref57) Pempelani Mufune, Community Based Natural Resource Management (CBNRM) and Sustainable Development in Namibia, 3 J. Land & Rural Stud. 121, 132 (2015).

[58] (#_ftnref58) Id. at 133.

[59] (#_ftnref59) Labaree, supra note 44.

[60] (#_ftnref60) Laura Taylor Singer, The Development of Catch Shares: Lessons Learned from New England, Gulf of Maine Research Institute 2011, http://www.gmri.org/sites/default/files/resource/the_development_of_catch_shares.pdf.

[61] (#_ftnref61) James Acheson & Roy Gardner, Fishing Failure and Success in the Gulf of Maine: Lobster and Groundfish Management, 13 Maritime Studies 8 (2014).

[62] (#_ftnref62) Emily Yehle, Senators Want Recreational Interests Included in Updated Law, Fisheries, E&E News PM (Apr. 25, 2016) http://www.eenews.net/eenewspm/stories/1060036215.

[63] (#_ftnref63) See generally Feeney et al., supra note 51.