



Deliverable



Project No. : FOOD-CT-2007-036928

Project acronym: AquAgriS

Project title: Environmental Management Reform for Sustainable Farming, Fisheries and Aquaculture

Instrument: Co-ordination Action

D33: Suggested guidelines and recommendations report

(from the Review of the existing standards, legislation, codes of practice, policies and regulations pertaining to environmental management, sustainability and the environmental impact of farming, fisheries and aquaculture industries)

Period covered: from 30.06.2009 to 30.06.2010

Due date of deliverable: 31.12.2009 month 24

Actual submission date: 30.06.2010

Start date of project: 01.01.2007

Duration: 36 months

Lead contractor for this deliverable: TransNational Consulting Partnership (TNC-P)

Project co-funded by the European Commission within the Sixth Framework (2002-2006)		
Dissemination Level		
PU	Public	*
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

DOCUMENT INFORMATION**Project**

Project acronym : AquAgriS
 Project full title : Environmental Management Reform for Sustainable Farming,
 Fisheries and Aquaculture
 Project start : 1st January 2007
 Project duration : 36 months
 Call :
 Grant agreement no. : FOOD-CT-2006-036298F

Document

Deliverable number: D24
 Deliverable title : **Suggested guidelines and recommendations report**
 Contractual Date : 31.12. 2009
 of Deliverable
 Actual Date of
 Deliverable : 15.05. 2010
 Author(s) : Fred Weirowski/ Jane Claricoates
 Participant(s) : WP4 Partners
 Work package no. : WP4
 Work package title: Analysis of Legislation and Policies , with Recommendation for the
 Future
 Work package leader: TNC-P
 Work package
 Participants : All Partners
 Est. Person-months : **10.5**
 Distribution : Public /web site
 Nature : Other
 Version/Revision : 1.0 Final
 Total number of :
 Pages (including cover) : 12
 Keyword : Legislation, Codes, Standards, Policies, Best Practices,
 Aquaculture,
 Fishery, Agriculture, Waste, Water, Environment

DELIVERABLE DOCUMENTATION

Governance for Environmentally-sustainable management of Aquaculture, Fisheries and Agriculture

Challenges and recommendations from the AquAgriS¹ review of the legislative and policy situation pertaining to governance for the environmentally-sustainable management of the primary food-production sectors

A brief summary for policy makers

Challenges and recommendations are presented concerning the institution of future standards, regulations, codes of practice and government policies on environmental management and sustainability, and concerning amelioration of the environmental impact of the farming, fisheries and aquaculture industries.

Background

The European project AquAgriS assessed key voluntary and legal instruments for their contribution to effective and coherent environmentally-sustainable governance of the Fisheries, Farming and Aquaculture (FFA) sectors within the European Union. The focus was on two main sectors; a) the food sector, including aspects of the regulation of primary food production, food safety and rural development; and b) the environmental sector, including regulation of relevant environmental issues, sustainable development and maritime policy. Arrangements at international, European and national levels were considered. Consumer issues and health, whilst not the primary focus of the study, are inextricably linked to the FFA issues identified, and are central to Priority 5 (Food Safety and Quality) of the 6th FP under which the AquAgriS work was funded. They are therefore included within the scope of this summary where they naturally and inevitably arise.

Sector-specific Policies of the European Union are embedded in a complex of legally-binding international regulations and agreements and voluntary Codes of Conduct. The complex also includes frameworks and guidance issued by many international organisations who actively seek to steer the global development of food production, food security, food safety; the management of biodiversity and environmental conservation, of resource use, of responses to climate change; and economic and social development and trade. They include, for example, outputs from the United

¹ 6th Framework Programme, Priority 5: Food Quality and Safety
Co-ordination Action Project/Contract no.: FOOD-CT-2006-036928
AquAgriS: Environmental management reform for sustainable farming, fisheries and aquaculture

Nations (UN) and the Food and Agriculture Organisation (FAO). The three sectors examined fall within the high priority European Commission policy areas of Fisheries and Agriculture, and thus command an influential financial allocation; their collective finances reached up to 50% of the European budget in past years. The European strategy for Fisheries is based on the Common Fisheries Policy (CFP), responsibility for which falls under the Directorate-General for Maritime Affairs and Fisheries (DG MARE); that for Agriculture is laid down in the Common Agricultural Policy (CAP) and is a responsibility of the Directorate-General for Agriculture and Rural Development (DG AGRI). Aquaculture, the smallest of the three sectors studied, has no dedicated Common Policy. To date, it has fallen under DG MARE and within the scope of the CFP. Strategic development of the aquaculture sector has been framed in isolation from Fisheries, through a series of strategic papers. The Directorate-General for the Environment is steering developments for the sustainable use and protection of the environment through a set of Framework Directives, in particular the (revised) Water Framework Directive, the (revised) Waste Framework Directive, the Marine Strategy Framework Directive, the Habitats Directive and the Birds Directive, amongst others.

Each of the FFA sectors, in particular that of Fisheries, is guided by numerous regulatory acts. Additionally, we found a substantial number of current voluntary Codes of Conduct, certification schemes and standards, and, similarly, many Best or Good Farm Practice and guidelines documents. Together, such instruments total in their thousands for the three sectors. Hence, the complexity *per se* of the governance situation presents significant difficulties when seeking a meaningful overview, requiring not only to follow many parallel themes but also to identify and calculate their interconnected impacts.

For all three sectors discussions and relevant policy developments and relevant legislative reviews are currently ongoing. The CAP faces serious discussions about changes towards a more sustainable agriculture and is on the way to being reformed as the anticipated CAP 2013. The failure of the former CFP has called for very intense discussions about the future Fisheries Policy direction and associated measures. European Aquaculture is emerging with a stronger voice as a global driver for food security, but no clarity is yet emerging as to where a European aquaculture strategy should be positioned in relation to a future CFP.

Notwithstanding this complexity at the European level of governance, the AquAgriS project was not focused specifically on the European level alone; therefore it was necessary to select some key issues from this complex array. The project thus aimed to identify key regulatory challenges for European aquaculture and the closely connected fisheries sectors, based on the understanding that governance for environmentally-sustainable FFA requires coherence between economic, social and environmental policies and political activities.

Challenges - Aquaculture

Whereas globally aquaculture is a business which has consistently shown growth rates between 6 and 8 % per annum over the last 20 years, European aquaculture development is lagging significantly behind, having been stagnating over the past few years (FAO 2009).

There is an increasing political will to strengthen the European aquaculture business. This will require a concerted development of responses to the range of structural and other challenges the sector currently faces.

Aquaculture Challenge 1: Confusion in legislation, certification and guidance

1. At the international level, aquaculture presence in central policies is not reflecting the sector's economic development over several years or its role as a global supplier and contributor to food security; for example within the Code of Conduct for Responsible Fisheries.
2. At the European level we lack a harmonized and supporting policy, and an associated clear legislative framework, for European aquaculture. The responsibility for implementation of aquaculture-related regulations is complex and is distributed between many authorities and agencies.
3. At national level, aquaculture-related legislation may, additionally, vary considerably from one Member State to another. For States outside the EU, it is increasingly difficult to comply with the rules set by EU legislation in order to maintain their access to EU markets. Despite efforts under the European Commission's 'Better Regulation' programme, for the operators in the industry, it seems increasingly difficult to get a clear picture of how the complex legislation and regulatory background fits together and how to comply with all regulations. Furthermore, Member States' Competent Authorities are not always clear. The administrative burden, especially for small and medium enterprises is still too high, particularly with regard to production licenses and EIA. The reduction of such burdens is essential in order to promote the development of the sector.
4. There is a puzzling situation of overlapping certification schemes and labels for aquaculture producers and products. Confusion amongst producers and consumers about the background and meaning of labels is widespread, and there is evidence that this is detracting from their acceptance and use and hence devaluing them. Many schemes seem obsolete. Stricter accredited schemes would need to harmonize the targets, to coordinate bilateral recognition of schemes at the production level and to comply effectively with the details of international and national regulations.
5. There is a confusing situation in relation to regional, national, sectoral and species-related Codes of Practice, Codes of Best Practice, Best Management Practices, guidelines and technical manuals for aquaculture.

Aquaculture Challenge 2: Global Competitiveness in economy and resources

1. European and global markets are hard to access with the high product prices caused by high input supply costs and ambitious social and environmental standards for European producers. Aquaculture products are not protected and have to compete price-wise and in quality with third-country producers. Aquaculture imports should meet the same standards as European-produced fish, environmentally, socially and in terms of food safety and quality.
2. Investments are needed in technology and in human capacity-building to reduce negative environmental impacts of aquaculture, to improve the efficiency of water and energy use, to avoid negative effects on biodiversity and to lower the product carbon footprint.

3. Small- and medium-scale farmers experience particular difficulties in accessing finance, a situation that is influenced by many factors including the perception of aquaculture as a high-risk business, insufficient market analysis, a lack of aquaculture development strategies, the difficult legislative environment and the economic vulnerability of small-scale farmers.
4. Increasing competition for space is creating additional barriers for new aquaculture sites or developments, particularly in coastal areas; similarly, competition with agriculture for water and the increasingly high costs of the required water quality management and waste water treatments.
5. Feed as an increasing cost factor, and fish oil production or the production of a cost-effective substitute, is likely to become a constraint for the expansion of aquaculture.

Aquaculture Challenge 3: Collective influence, coordination, and image

1. The high degree of fragmentation and diversification within the aquaculture sector, make it difficult to gain enough political weight within the administration.
2. There are still not enough systematic approaches focusing on overcoming sector barriers between agriculture, environmental businesses and aquaculture producers. Research and development, and systematically organized coordinated politics, are required for one integrated food sector.
3. Selective support is needed for smallholder farmers as the stewards of environmental goods and services (e.g. water storage and biodiversity) and as food suppliers to local markets. Incentives for development of entrepreneurship in aquaculture have created insufficient impact for sector-wide job development, but appear to have been successful for developing high value products for niche markets.
4. Generating a positive image of the aquaculture as an environmentally-sustainable working sector is a time-consuming process and needs the concerted action of the public and the private sector, responsible management, monitoring and marketing.
5. The sector is considered from a global perspective as a potential polluter of the environment, as a result of its earlier intensification which revealed a broad spectrum of environmental problems.
6. There not enough awareness about the environmental services that are delivered by European aquaculture; e.g. producing food in a cultural landscape and delivering positive environmental effects, e.g. water storage and the capacity to produce controlled, monitored and certified environmentally-sustainable fish products.

Aquaculture Challenge 4: Communication, knowledge development and new technologies

1. Significant communication gaps exist between the legislative authorities and the industry, creating fragmented and inconsistent knowledge about the legislative environment being developed to support environmentally-sustainable management of the sector.
2. Research and development for economic, environmental and socially sustainable (clean) production methods is very costly and needs strategic orientation and

support. For example, there is a desire to use other species in European aquaculture, with the attendant and serious risks related to the negative impacts of alien species.

3. Aquaculture expertise and technological skills are underused during the restoration of ecosystems but offer promising fields of collaborative research and project activity. Environmentally sustainable production methods may ensure essential future competitive advantages for European aquaculture products.
4. The scientific background for environmental services, such as water buffering, disease treatment, water treatment and the conservation of ecosystems delivered by aquaculture is not valued or communicated within broader awareness and implementation actions.
5. The changing structure of aquaculture, diversification of income sources for smaller farmers and decreasing employment, might be a consequence of global competition. More incentives for development of entrepreneurship in aquaculture may support job developments for new organic or high value products and environmental technologies.

Aquaculture Challenge 5: Influence of new external drivers

1. There is increasing pressure on producers to reduce greenhouse gases (GHG) and specifically to reduce the product carbon footprint (PCF) within the whole supply chain.
2. Demand for comparable, scientific-based and publicly-acceptable methods for PCF elaboration requires extended databases and monitoring. There is recognition of the advantages and the need for carbon life-cycle thinking.
3. There are new threats and opportunities for European aquaculture coming from developments in climate change understanding and responses. Environmental legislation needs to include a greater sensitivity to the global implications of climate change for aquaculture.
4. European Producers should receive more recognition for their contribution to the long-term future competitive advantages of the quality of their products, the quality of the environment and the trust of consumers. For example, EIA's retain opportunities for the economically-feasible production of aquatic species.
5. The aquaculture sector is being driven to shift from straightforward food producer towards the uptake of technologies which result in provision of environmental services, for example the production of biomass, the storage or buffering of water, conservation of biotopes, waste reduction and treatment, recycling of water, and disease control.
6. Concerns about food safety, stemming from negatives examples of imported products, are influencing the image of European aquaculture products.

Challenges - Fisheries

There is a continuum in the objectives and political intentions of the former and recently-drafted new Common Fisheries Policy: 'The European fisheries policies should provide for sustainable exploitation of living aquatic resources and of aquaculture in the context of sustainable development, taking account of the environmental, economic and social aspects in a balanced manner'. This objective is gaining importance and validity; the failure of the former fisheries policies did not allow a continuum in the political practices and has

demonstrated a need for a change of methods to achieve this goal.

Fisheries Challenge 1: Establishing effective governance to support environmentally-sustainable fisheries

1. Identify and address the reasons for the failure of the former CFP, focusing in particular on the development of a decision-making framework based on core long-term principles, to overcome overcapacity, overfishing and non-compliance.
2. Significant harmonization and streamlining of existing legislation will be essential to move away from the current 'micro-management' of European fisheries, and to avoid any form of decision-making system that encourages a non-sustainable short-term focus and does not give sufficient responsibility to the industry for long-term perspectives and sustainable environmental management in the policies and their participatory implementation.
3. The political environment for environmentally-sustainable fisheries should be improved by embedding the new CFP into the Integrated Maritime Policy of the European Union and its environmental pillar, the Marine Strategy Framework Directive. Implementation of the ecosystem approach as the highest priority in European fisheries will need comprehensive political and financial resources and strategic support.
4. There is a strong consensus among stakeholders that the integrated coherence of economic, social and environmentally-sustainable governance requires productive fish stocks and healthy marine ecosystems. Ecological and environmental sustainability is seen by many stakeholders as the core priority of the new fisheries policy.
5. Demonstrable and improved political will is necessary to ensure compliance with clear and understandable policies; the ability to enforce the regulations, monitor and improve compliance by the industry; and improvement of existing imprecise policy objectives within the EU regulations which currently result in insufficient guidance for decisions and implementation.
6. Compliance and enforcement of the regulations concerning illegal, unwanted and unreported fisheries (IUU) is a priority, with consideration of the role and capacity of small scale fisheries.
7. Certification of fisheries needs competition and an overall system of indicators and standards, approved at an international and national level. Certification is progressing but the MSC remains without competition. The demand and criteria for organic certification of marine fisheries needs further development and discussion.

Fisheries Challenge 2: Resource management and competitiveness

1. Overfishing is the most important challenge, where the majority of Community stocks are being fished beyond their maximum sustainable yield. While the extinction of fish-stocks has become a real possibility and, subsequently, fisheries policy has become an issue of security and survival on a global scale.
2. Putting the health of fish stocks as the top priority for the CFP requires a strengthened political will to ensure compliance within the industry and to enforce clear, understandable and practicable regulations in all Member States.
3. Eliminating fleet overcapacity within the EU Member States to attain an ecologically-sustainable size is a central economic (and social) challenge. General policy principles should accompany decentralized management. A community-based legislative framework, for example legally-binding fleet reduction targets for Member states, should be developed and proposed by Member States with industry participation, with penalties for

non-compliance. This would ensure the ability to limit overall capacity through legislation, having in mind that this should still streamline the existing highly complicated fisheries legislation.

4. Improvement of existing low economic resilience of the fisheries industry must be addressed, and its adaptation to changes in the business environment and markets achieved, avoiding further economic, environmental and social losses from under-utilisation or inappropriate use of maritime resources.
5. Use of all biological resources, for example trash fish, discards and animal wastes, as valuable resources of biomass and/or protein and others, should be supported by dedicated research and development as well as incentivising instruments, while ensuring compliance with the overall ecosystem-based fisheries management targets.
6. Systematic minimization or elimination of discards is an important long-term aim for ecological sustainability. It needs innovative solutions and technologies as well as a political environment which drives the industry to value discards as a potential resource for applications and products. Cutting back on discards by shifting Minimum Sustainable Yield from landings to takings should be one option.
7. The new CFP 2013 and Member States must include the fisheries industry actively, by delivering clear indicators and objectives setting out how they can contribute to achieving the Good Environmental Status of Community waters according the requirements of the MSFD.
8. Competition for maritime space is also on the rise as ever-larger areas of our seas are used for other purposes. More strategic marine spatial planning and monitoring is required, to avoid the negative effects of the increasing competition for maritime space which may affect particularly the economic vulnerability of small scale coastal fisheries.

Fisheries Challenge 3: global role and external driver of climate change

1. Globally-harmonized, environmentally-sustainable governance of fisheries is a challenge for all involved global institutions, particularly the FAO, where further enforcement and development of the CCRF is demanded, but demanded particularly in respect of European fisheries, as a major player and market power.
2. The competitive situation and the instability of the resource management will increase if there are not regulations to force all actors in the fisheries sector to comply with the essential long-term objectives of policies and codes, such as the CCRF.
3. Growing awareness of the prime importance of our oceans and seas places much stronger emphasis on the ecological sustainability of fisheries worldwide; therefore global responsibility for, and consequences of, any policy regulation is growing.
4. There is a need to strengthen the role of the EU as a global player, ensuring the direct influence and impact of European Fisheries policies on stock management and regional /national economies in the outermost regions of the EU, and as a result of the Partnership Agreements with third countries. European Fisheries are strongly connected with the global economy and must adapt to changes in the business environment and markets.
5. Climate change threatens particular marine ecosystems and biodiversity, already under pressure from pollution and overfishing, which will thus be further affected by warmer temperatures and acidification, with changes in species reproduction and abundance, changes in the distribution of marine organisms and shifts in plankton communities.

6. We may see further ecological perturbation and management complications in regions where no reliable data about stocks exist, particularly in coastal fisheries and fisheries in the outermost regions and within fisheries in non-EU states, regulated by Partnership Agreements.

Fisheries Challenge 4: Communication, knowledge and technology development

1. The future CFP should connect harmonization with interconnectivity and broader communication. It must be integrated, inter-sectoral and multidisciplinary in its design, and must give a clear account to the industry of how fisheries within an environmentally-sustainable governance framework must operate.
2. The Maritime Policy and the Marine Strategy Framework Directive should be promoted and understood as an opportunity for the fisheries sector to embed sustainability principles and demands into political decisions regarding the conservation and management of the marine environment, and to gain greater influence on political decisions through improved communication and influence at international, national and regional levels.
3. Social Competence will be rewarded by the markets. Consumer trust is at stake: awareness-raising organizations, banks, consumers, processing and retail sectors increasingly share the concerns of overexploitation and of unsustainable fisheries management. They require guarantees that the fish they consume and sell originates from well-managed and sustainable fisheries.
4. Develop a sustainable – environmentally-, socially- and economically-balanced – and feasible fishing regime which actively fosters greater resilience of small scale fisheries within the EU and within the global activities of EU in partnership agreements with third countries. The policies should avoid excessive concentration of ownership and the negative effects on smaller-scale fisheries and coastal communities.
5. There is an essential need to reduce fleet overcapacities stepwise. This has implications for the job market and is a social issue for many fisher families and communities. Sensitive governance programmes at the local level must be in place to create jobs in other sectors, particularly in environmentally-friendly industries, to help fishers leave the industry.

Fisheries Challenge 5: Research, development and capacity-building

1. Research about the condition of stocks is a priority, and is needed to define and to monitor fisheries management methods. Putting environmental sustainability at the centre of the CFP means an end to fixing quotas. There seems to be a broad consensus among stakeholders that maximum sustainable yield (MSY) must be a target of any environmentally-sustainable governance concerning stock management, to reduce overfishing.
2. Intense research and development is needed more than ever to monitor the impacts of the new policies and strategies. The wider implications of fisheries on marine ecosystems as well as the social and economic aspects should also be included within the definition of sustainability within the terms of MSY.
3. Policy guidelines are demanded to assist in operational matters concerned with fisheries management within new limitations. Such guidelines must be regional, practical, clear and understandable for the operators in the industry.

Guidelines must respect the high diversification of the businesses and the specific environmental, economic and social impacts.

4. Enhanced research on fisheries-related climate change questions and the application of the ecosystem approach are further challenging priorities. Strategic impact assessments and better knowledge about the functioning of marine ecosystems are widely considered to be important. Product life-cycle analyses and enhanced databases will help in strategic planning and economic decision-making aimed at reducing carbon footprints, and in supporting the marketing of fisheries products.

Challenges – Agriculture

Discussions on the European Common Agriculture Policy 2013 is showing that there are ongoing changes required in the policies, to steer development of the sector away from support for product prices, producers' income and rural development towards a more complex environment-oriented and sustainable agriculture. Dramatic changes in the global economy and new global drives e.g. climate change and food security in developing countries are challenging the agriculture policy system further.

Agriculture Challenge 1: Increase environmental sustainability, competitiveness and economic sustainability

1. A main challenge for Community Agricultural Policy (CAP) is to steer the sector's development towards an economic-, social- and environmentally-sustainable agriculture industry in the European Union. Furthermore, it will be essential to adopt a stepwise process for reducing the enduring direct support for prices or farmers. There is an urgent need to create completion within the sector at a global scale, to enable new forms of income for the rural communities, for example, provision of environmental services, non-agricultural businesses and by development and uptake of new agricultural technologies.
2. A priority for the new CAP is to find socially-acceptable and economically-feasible solutions for this development to create a self-sustaining agriculture industry that is competitive in quality and price in open global markets.

Agricultural challenge 2: Collaboration with food producing sectors and leadership

1. As there is no visible or systematic framework for the interconnectivity of the primary food-production sectors like fisheries, aquaculture and agriculture. The challenge is to create more leadership, identify common goals and recognise the interconnectivity with other sectors, and to develop an effective and coherent environmentally-sustainable governance framework.
2. The new strategic policy frameworks, such as the Water Framework Directive and the Waste Framework Directive, were not driven by leadership from within the producing sectors. An inherent challenge here, consistent with industry connectivity, common goals and operator participation, would be enhanced participatory and coordinated communication between the authorities and with the operators of the industries concerned.

Agricultural challenge 3: Rural development

1. There is a need to secure strong and sustainable rural development through adoption of environmentally-sound agricultural methods and economic diversification activities for farmers. The detailed response to this challenge will differ in certain regions of the European Union, but would contribute much to the priority of sustainability.
2. Increased competitiveness in agriculture could lead to situations where the conservation and management of the environmental services needed to maintain the existing cultural landscape is rewarded through new forms of income in place of financial interventions that favour economically- or environmentally-unsustainable agriculture. It would be a challenge for the goal of environmentally-sustainable governance to maintain and to develop the quality of life in rural areas and opportunities for diversification of the rural economy, beyond agricultural activities per se. Already a substantial part of income created in rural communities derives from non-agriculture businesses, for example from tourism. Encouraging enterprise development and employment in the rural economy, for example through development of green businesses, is a challenge that would benefit from resolution in collaboration with other economic sectors.

Agricultural challenge 3: Protection of the rural environment, and climate change threats

1. The environment and historically-evolved rural cultural landscapes are a heritage and wealth of the whole society. To protect them active forms of agriculture management are necessary and appropriate. This needs more research and regional knowledge to decide which changes towards extensive agriculture methods are possible or if, for example, certain types of protected areas might be more appropriate. Measures and services to protect such selected areas are economic and socially [valid claims](#) by society, and provide social goods and measurable services.
2. Climate change will be a threat to agriculture in some regions of the European Union. A priority challenge seems to be to activate mitigation measures, calculated, for example, in relation to the Nitrate Directive and other such existing instruments. Product carbon lifecycle inventories are needed to create a clear picture for policymakers about the carbon equivalents of desired European agriculture products. Results should contribute to an evaluation and recommendation for policymakers about which products are economically, environmentally (and socially) feasible and sustainable for the European regions, and to indicate where the potential for GHG reductions exists through changes in the production profile of European agriculture.

Summarized, the AquAgriS project team is seeing following field of demanded activities:

- Improvement of the policy guidance and legislative framework for sustainable governance with environmental sustainability as policy priority;
- Improvement of the strategically sectoral and inter-sectoral collaboration, leadership and communication between the sectors on international, national levels;
- Improvement of global competitiveness of the industries under the regime of sustainable environmental governance.
- Improvement of the sustainable and strategically use of resources, particular the fish stock management, spatial planning of locations and space allocation for food production;
- Improvement of all technologies to avoid pollution and waste and increase the re-

use of such resources

- Strengthen the research and development activities and human capacity building
- Strengthen the social responsibility for producers, for disadvantaged producer groups and communities.