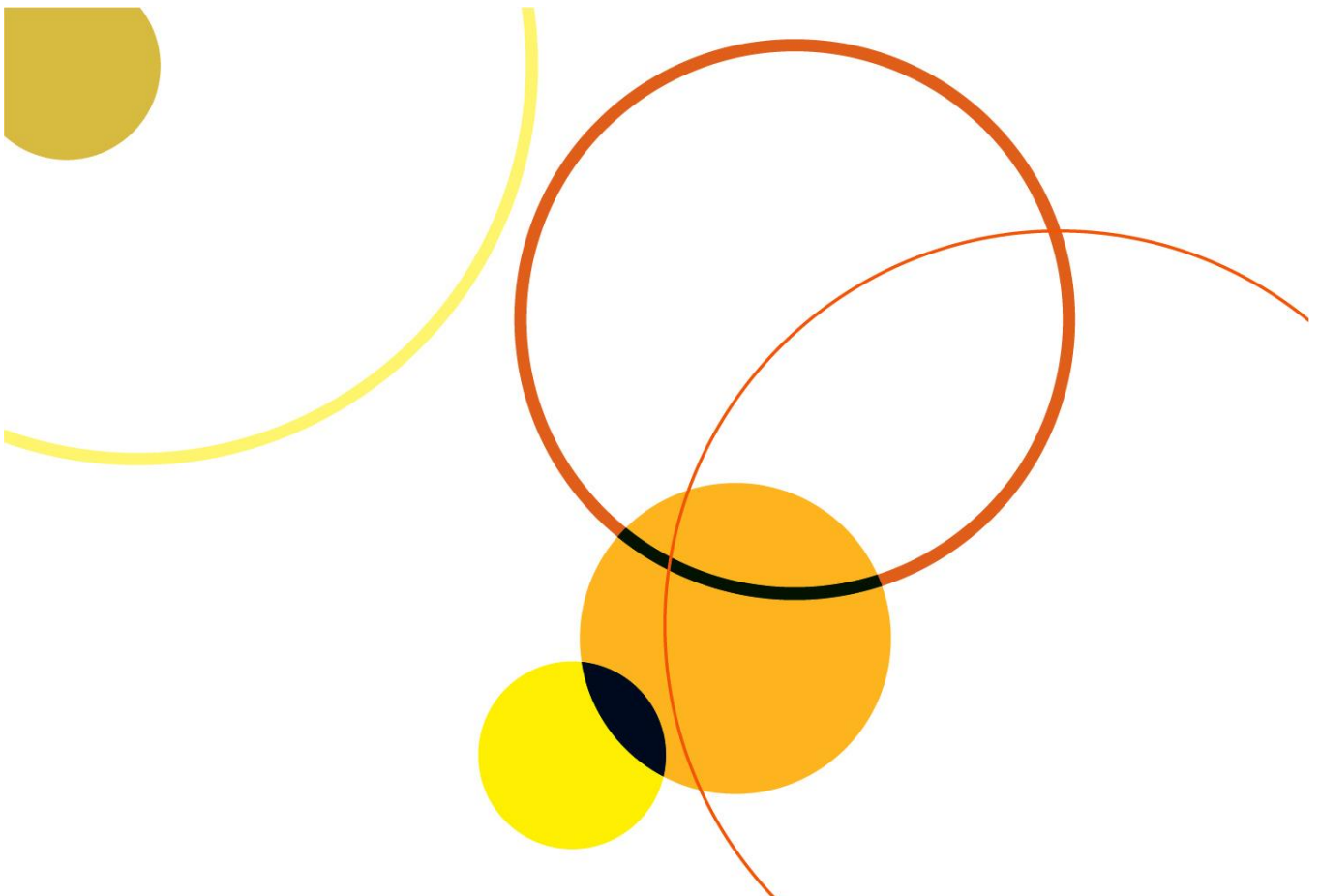

Towards Investment in Sustainable Fisheries: The Role of Finance

Discussion paper prepared for ISU-EDF

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1 Introduction

The benefits of investment in fish stocks and supply chains

This discussion paper explores the participation of investors in the transition of fisheries to sustainable, high productivity, discussing the financial structures, project vehicles, associated policies and risk management strategies that might be employed.

The purpose of this paper is to show investors, government and other participants the potential role of finance in fisheries transition. It asks why, how and who would be involved when investment takes place. It describes the nature of the investment and associated revenue streams, shows how the financial arrangements might be structured and introduces the types of investor who might be involved. It also considers how the financing of fisheries might evolve over time and how a programmatic approach to the development of this financial market might accelerate its maturity and expedite investment.

A well-managed fishery is an asset. A productive fishery has a productive stock and supportive ecosystem, making up its natural capital. It has an effective management system, regulating fishing pressure. Its fishers are knowledgeable, their vessels are well equipped and fully utilised and they have efficient means of getting their product to market. This natural, management, catching and supply chain capital adds value by increasing prices, reducing costs and raising quantities of production. They lead to higher prices as a result of better quality product reaching consumers and a fairer distribution of surpluses. They cut the cost of fishing, processing and distribution and they increase the volume of fishery output. All these forms of capital are obtained through investment: investment in the natural asset, recovering it to a more productive state; investment in management systems, giving stable long-term control; investment in equipment, supply chain logistics and processing to add value; and, by creating incentives to cooperate.

Investment begets investment. One of the advantages of making a leading investment in restoring the natural capital and management systems, among other elements of a fishery, is that the commitment and long term reliability which it signals will encourage other parties to make investments, in vessels, ports, processing, market development and so on. None of these occurs without secure natural capital to underpin them. A second advantage is the crowding in of investment, which can happen where the presence of knowledgeable, capable investors with a reputation for competence, achieves investment success and attracts the participation of other less specialist investors, who join the opportunity identified by the former. By these two routes, initial participation of suitable investors in natural capital can lever substantial additional capital flows and value creation.

Unfortunately, many fisheries have experienced dis-investment, that is, the depletion of natural capital. Economic history shows how damaging to welfare disinvestment in natural capital can be. It is common to find that natural assets in fisheries have been consumed or degraded and ineffective institutions have been unable to channel investment to sustain and restore them. Recent periods of under-investment in quality management and in fish stocks have created attractive opportunities for investment now, to the potential benefit of all of society: consumers of fish, fishers, the rest of the sector supply chain and taxpayers.



One can be optimistic that improvements in the understanding of what makes effective fisheries management, including the use secure tenure and other policies, mean that alongside access to capital, the science of how institutions can be made more effective is well developed. The politics will always be a potential source of challenge because the costs and benefits of reform may not be evenly distributed.

The question of how to distribute the costs and benefits of optimally managed natural capital is at the heart of the political challenge. In fisheries, since the underlying capital is a natural, renewable resource, the underlying foundation of investment is the building up of the stock in the fishery to the level of maximum economic yield or maximum sustainable yield. This is achieved by reducing fishing mortality to below the level of recruitment. Short term reductions in harvests are offset by growth in the stock, which will become more productive in the long-term. Unlike traditional investments, this investment does not involve expenditure directly on the stock itself, but it does involve the same forgone consumption or saving and it involves expenditure on the management systems to control fishing mortality, to set science-based limits and to monitor recruitment. Thus there are two elements of investment that can be made in the stock, one in the form of management expenditure and the other in the form of foregone income. One might be made by a management authority of some description and the other by the fishers and the whole of the supply chain. At a later date, the payoff from investment is a larger and more profitable catch of fish, to the benefit of future fishers and the whole of the supply chain. In financing this transition from a low to an optimal stock there is a political question to address, which is how the costs and benefits of the transition will be divided between people today and people in the future and, in particular, between fishers and others. Financing allows the cost of transition to be transferred to a later date, but there is a political economy question as to whether and to what degree to compensate fishers today for the sacrifice of reduced harvests during the period of transition: the transition may need to achieve broad support from participants if the policy is to stick.

The choices of detailed institutional arrangements are much easier to make once political decisions have been taken. Political choices over the objectives of transition and the distribution of costs and benefits from transition will be made before the design of the institutions to deliver them. In particular, the form of tenure or rights to fishers, commitments and accountability follows the function assigned to them. Options such as ‘leasing’ of fishing rights, the purchase of rights or the suspension of fishing rights, which have fundamentally different distributional effects, will be discussed later in this section.

The finance market is segmented to allow specialisation. This needs to be understood in order to make the best use of finance in funding the transition. Just as in other markets, specialisation leads to greater productivity and this is also the case in finance. This specialisation appears in the products or forms of finance available, such as debt, equity and guarantees which transfer risk between parties to different extents, and in the financial institutions, whose resources are most effective in taking on particular roles or being active in specific sectors. Since the general financial market is large and developed, but financing of fisheries transition is nascent, it must be structured wherever possible to take advantage of the general products and institutions to secure the least cost distribution of risk and the most effective intangible benefits of governance and policy commitment.

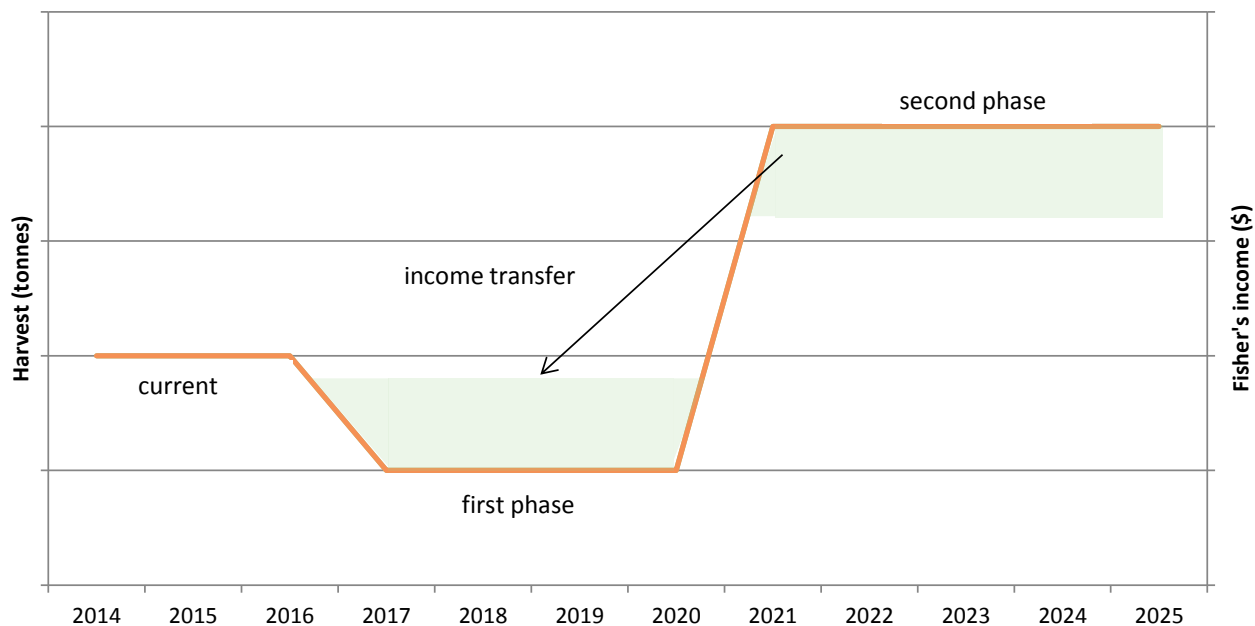


2 Smoothing the costs of transition

Using finance to synchronise the timing of costs and benefits

There are a number of expenditures to fund: the initial set-up and transition, the ongoing management, the individual fisher and vessel monitoring and the wider environmental programme, as well as the opportunity cost of the temporarily lower catch. As explained above, the transition to a fully productive fishery involves (amongst other things) additional expenditure on management and potential compensation for lost income at a time of reduced revenue. Finance can be used to shift the burden of these costs and transfers to a later time, when revenues have recovered, incomes are higher and there are surpluses sufficient to repay these expenditures. The pattern is shown in Figure 1.

Figure 1. An illustrative control path for fishery transition



Note: Harvest and income are both shown as higher after transition. It is likely that income will be higher. Harvest might be lower.

Source: Vivid Economics

The cost of management controls may be difficult to meet from income during the transition period.

An effective management system is based on scientific research to monitor and model the status of the stocks. The scientific information is valuable but involves some cost to collect and process. The design of the management regime and the establishment of the institutions to run it is a larger expense, nevertheless it is smaller than the ongoing costs of operating and enforcing the management controls. The ongoing expenses include administration of licensing, setting of allowed catches, self-reporting and remote monitoring,



inspection of vessels and enforcement of compliance. During the period of transition, when fisher revenues are already reduced because of low allowed catches, it may not be feasible to share these revenues sufficient to fund management expenditure, but when the fishery is operating at full productivity, there may be more than sufficient revenues available. In this case, finance offers the means of implement the needed changes in the short-term, while delaying payment for the expenditure until the stock has recovered and surplus revenues are available. In the long run, many fisheries will be self-funding. There have to be compelling social reasons for continue to operate fisheries which are not self-funding.

Ecosystem management may be integrated into the fisheries management regime. Being part of an ecosystem, the management of the fishery might not be separable from the management of the ecosystem or wider marine environment. If they are managed on an integrated basis, non-fisher activities such as habitat protection might be funded under a common arrangement, using the income from the natural capital asset to pay for the sustainable management and maintenance of the whole of that asset.

Investing in natural capital in many cases involves the temporary or permanent reduction in fishing effort. Since there are, in virtually all circumstances, many fishers, a management system is needed to coordinate action and to ensure reduction in effort. The management controls may encompass both fishing mortality and collateral ecosystem damage. The primary control over mortality is usually the catch, achieved directly through allowed landing weight or sometimes indirectly via allowed fishing effort or licensing of vessels. This is usually supplemented by restrictions on minimum landing size, prohibited areas, landing of berried (gravid) females and allowed gear types.

The reduction in fishing mortality requires fishers to contribute to transition by temporarily reducing their incomes. A reduced catch can usually be made by reducing catch of all participants in a fishery, by reducing the number of participants, perhaps temporarily, or through a combination of both, until the stock increases. Some forms of fishery management, such as transferable catch rights, establish a market mechanism to transfer catch opportunities between fishers, allowing for adjustments of catch and possibly compensated exit from the fishery. Other forms of management do not establish markets for adjusting catch between participants, and exit is often uncompensated, occurring when incomes from alternative employment becomes larger than that from fishing. In the former case, transferable rights, the remaining fishers compensate the fishers who exit the sector. They may find capital to purchase catch entitlements from fishers who exit, and it may help them to have access to finance. In the latter case, an absence of rights, or a prohibition on the transfer of rights, weakens this market mechanism for exit. Consequently, a share of the return might become part of a package of reform, offering an inducement to accept the reform, or there may be payments made to fishers who exit the sector. Thus there are two ways in which a share of the return might be facilitated through finance, one directly by the funding incentives to fishers under a scheme in which rights have not been established, and the other indirectly, in which rights are established and are sold or otherwise transferred from some fishers to other fishers.

There are at least three ways that fishers could capture a share of the return from investment. The first, leasing, takes established fishing rights and transfers the option to use them to a third party for a defined time, perhaps with the option to extend the length of lease or to break it early. The price of the lease reflects the opportunity cost to the lessor: a proportion of their wages and profits from fishing. If the lessor can find alternative income from employment while they are not fishing, he or she will be willing to accept a lower



price. Then, when the lease expires at the end of transition, the lease will return to the fisher who can resume his or her fishing activities. The feasibility of this option partly depends on the ability of fishers to re-enter the catching sector after a period of inactivity. The second, a management buyout, involves a fisheries association, such as a cooperative, buying out the rights of all the fishers. A buyout would be most easily achieved if, when the rights are established, a decision by some majority of fishers to sell their rights to the association can force or ‘drag along’ all the other fishers and that no fishers are willingly left out of the process, being given the right to ‘tag along’. This association would need to have a strong constitution and management and either a memorandum or policies on how access to fishing would later be allocated between fishers, presumably on the basis of their original rights, any limitations as to whom and when they could later transfer those rights to others and any restrictions on how those transfers would be priced. The third option is a rights swap, in which the fisher swaps their current rights for the option to take up future rights. They are paid to relinquish their current rights, providing the compensation during transition, and will have to pay some amount to exercise the option in the future when transition is complete; additionally they might be offered a loan or commercial mortgage to help pay to purchase the option later. A question with all these arrangements is how to anticipate the future allowable catch and efficient fleet size once transition is complete, so that an orderly exit of capacity is achieved, if it is needed. This is because the maximum sustainable yield may be lower than catch levels before transition begins and the efficient fleet size at maximum sustainable yield may be lower. Some purchase and retiring of rights, conversion of rights from absolute rights to shares, or buy-back of rights may be appropriate.



3 Capturing returns on investment

Sharing the gains between investors and other stakeholders

One or more mechanisms could be introduced to capture and share revenues in order to pay for the transition costs and to fund the ongoing fishery expenditures. There are several principles which might guide the introduction of payment mechanisms, helping to ensure they operate fairly. Key features guiding their design would be that the mechanisms recover revenues according to a stated purpose of recovering costs, repaying finance or sharing surpluses, with clear accountability and transparent reporting of figures against these objectives.

Four mechanisms are suggested here. The greatest transparency, and perhaps political acceptability, is achieved by establishing mechanisms specific to each investment. There are a number of investments to fund in management and the opportunity cost of the temporarily lower catch, meanwhile there may be complementary investments in ports, logistics and other supply chain infrastructure. For each of these, there is a revenue recovery mechanism. For example, a levy can be used to fund public goods such as environmental improvement, while a fee is more appropriate for covering the costs of licensing, monitoring and the scientific programme. The term ‘levy’ is generally used where the goods and services purchased with the funds raised do not benefit only the people who paid the levy. The term ‘fee’ means a payment which gives the purchaser rights to goods and services, here the opportunity to catch fish, where the payment is not used to fund the direct costs of producing those goods and services, here because they are partly the product of natural capital. The recovery of the initial investment in the stock and for access to other assets such as port infrastructure and auction facilities might be best achieved through a charge on landings. This charge would vary over time, reducing as the finance is paid off and falling to a level where it is sufficient to cover ongoing maintenance and operation of facilities. If, after this point, a mechanism is introduced to share the revenue, as the fishery is considered a public good, then it might be labelled a royalty. These capturing and sharing mechanisms are summarised in Table 1.



Table 1. Menu of revenue sharing mechanisms

Type	Base	Association	Timing	Explanation
Levy	Sales or catch	Public environmental goods	After finance paid off	Pays for protected areas, research and development. Benefits felt widely
Fee	Vessel or fisher	Licensing, monitoring, science	Partial from start of transition	Pays for the fixed costs of management systems. Benefits participants, like a club membership
Charge	Sales or catch	Infrastructure, transition finance	Once stock rebuilt	Pays for supply chain infrastructure and transition finance. Benefits users in proportion to their activity
Royalty	Sales or catch	Surplus	After finance paid off	Shares the rent between participants and society

Note: We do not consider here the merits and demerits of basing some mechanisms on sales or catch.

Source: Vivid Economics



4 The structure of finance

Assigning risk and engaging investors' governance skills

The objectives in choosing a financial structure are to transfer risk at least cost, to force commitments to capture a share of the return and to benefit from the resources of participating institutions. The structure of the finance, that is, the elements in the capital stack and the contractual terms under which they are offered, have the effect of partitioning the risk between financing parties, of limiting the actions of those parties and of restricting the discretion of managers. The purpose of these arrangements is to reduce cost by incentivising good management of risks, by allocating risks to parties who can best control or most cheaply absorb them, and by obtaining the involvement of parties whose expertise and skill can improve the performance of the fishery.

Risk structuring can reduce the tax liability for the investment vehicle. The differential tax treatment of debt and equity can distort the choice of financial structure and can be highly material to the returns to investors, but taxation is specific to local tax rules and there is nothing to be gained in a general treatment such as this from exploring the range of tax planning arrangements that might be adopted.

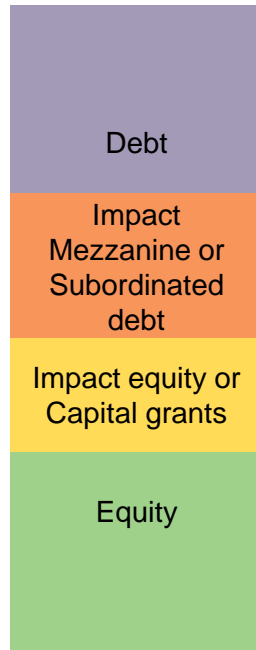
The capital may be composed of a variety of products. Capital grants enhance returns to the other finance components and shift up the returns or reduce the risk of default to each. Capital grants would typically be provided by a philanthropic foundation, a local government or a foreign donor government. Further enhancement can be achieved by guarantees which syphon off specific risks. Guarantees relating to policy commitment or institutional performance might be written by a local government while sovereign risk guarantees might be written by an international financial institution, such as a development bank. Equity, which absorbs much of the project risk and participates fully in upside performance, might be provided by local or international private investors or by local participants such as fishers, processors or exporters. International equity investors may feel more protected against the risk of some degree of expropriation if there is local equity participation and small investors may feel similarly protected by the presence of large institutional investors capable of making a robust legal challenge to interference or renegeing on contracts. Sitting underneath equity in the capital stack, there could be a tranche of subordinated debt in place for the purpose of enhancing the credit risk of the ordinary debt. This structuring of the debt into tranches might allow part of the debt to attain a higher credit grade and to tap a larger and more liquid pool of capital. Access to larger pools of capital can make the financial structure easier to complete and can improve the terms of contract. However, the subordinated debt is a more complex product and might have to be provided by a specialist group within, for example, a development bank. A development bank might also be able to lead the syndication of ordinary debt and, by taking a lead, could reduce transaction costs. The ordinary debt completes the financial structure.

The capitalisation needed for individual fisheries may be small. In the two case studies presented here, calculations suggest that the scale of investment needed is less than USD 20 million. This amount is likely to be too small to justify the cost of a more complex capital structure, but it is possible that the portfolios of investments can be built up to form a fund and that a fund could provide all or some parts, such as the debt



and risk mitigation products, of the capital stack in the small amounts needed by some fisheries. This would leave open the possibility of local participation in the equity and would not rule out local participation in the debt portion.

Figure 2. **A mixed stack makes for a more efficient financial structure**



Source: Vivid Economics



5 Types of investor

Identifying investors whose objectives suit fisheries

Most investors will require market returns. Although there are some ‘impact’ investors such as family trusts, philanthropic funds and donor governments that target environmental or social impact as much as they target returns, these make up a small proportion of global capital available and there are many calls on their resources. In order to secure the scale of funds which can transform fisheries globally, the returns available will need to achieve market rates in at least part of the capital stack. Investors who have a direct interest in the health of the fishery, such as fishers, processors, exporters and government, may accept sub-market returns from the investment on the expectation that they will benefit from a capital gain in the value of their direct business or policy interests and so it may be possible to reduce the cost of finance by encouraging participation from these individuals. Even with these investors, the competition from other investment opportunities will discourage investors’ participation unless the financial components are priced close to market levels. The benefits to fishers will be increased catches when the total allowed catch is raised and reduced cost per unit catch as the stock builds during the transition. There may also be greater efficiencies in management, in fleet utilisation and in the supply chain. The processors and exporters will benefit from increased volumes and improved quality and prices.

On the debt side, investors differ in the opportunities which they pursue. Some, such as institutional investors, that is the pension and insurance funds, are very large scale and invest mainly in large scale, standardised and low risk projects. They also look for intermediated opportunities by placing their investments with banks, infrastructure funds and other managed financial institutions which go on to make individual, smaller-scale, managed investments of a whole variety of types. It is not likely that they would invest directly in fisheries themselves. Investment banks, however, may intermediate debt investments in fisheries and could aggregate this debt and sell it on, perhaps as blue bonds, if there is market demand for paper of this type, for example from institutional investors. For the faster growing fisheries with the best existing institutions, the debt could be dated five to ten years, but for slower growing stocks and weaker institutions, the investment period might be 10 to 20 years, and this is likely to push beyond the boundaries of most debt markets. This is where the international financial institutions such as the development banks could play a role. They are able to take quite long term positions on investments and there are two reasons why they can do this. First, they have objectives other than making commercial returns and expanding their business, which is to achieve development goals. Second, they can manage political and technical risks through the medium of their influence with local governments and the provision of technical assistance. This technical assistance may be provided at subsidised rates or free and may be a condition of the loan. The international financial institutions can also provide a useful role in maturity transformation. That is, they can convert a portfolio of longer-term debts into parcels of shorter-term debt which they can sell onto the investment banks or structure into funds which larger institutional investors can buy into. In establishing these products, they may also introduce some forms of credit wrapping insurance to further reduce the risk to the investor.



On the equity side, risk management capability is valuable. Equity investors have more influence over management policy than debt investors and they absorb more risk. Investors with fisheries management experience will have a strong advantage over other investors in fulfilling the equity finance role. The role lends itself well to individual local fishers, via subscription or through an aggregator such as a Cooperative, fish processing and trading companies, and private investment vehicles specialising in fisheries investment. The smaller investors, such as fishers, are too small to take a lead and exercise the supervision which is an essential part of the equity participants' role. All these participants bring knowledge of the risks involved in fisheries transition to the investment and are able to exercise more effective control over the management as a consequence. The greater their stake, associated long-term interests, local knowledge of the local fishery and knowledge of fisheries transition in general, the more effective they will be as shareholders, but they will need management resources, and that means the controlling equity participants should have scale.

Table 2. A classification of investors

Variable	Traditional	Responsible	Thematic	Impact first	Impact only
Typical investment	Those that generate financial returns	Those that protect or enhance competitive financial returns through ESG analysis	Those that can generate a competitive financial return	Those that generate a below-market financial return	Those that require grant funding with no capital repayment
Typical investor	Institutional Investors, Private Equity, Retail Investors, Commercial banks	SRI investors (Socially Responsible Investors)	Social/impact Investors, Development banks	Foundations, Governments, Social/impact investors	NGOs, Foundations, Governments

Source: (Bridges Ventures, 2012)

There are fewer investors willing to participate in 'First of a Kind' deals. The transaction costs of 'First of a Kind' deals are high and risk management is less effective so most investors eschew these opportunities in favour of commoditised and standardised deals. However, the 'First of a Kind' and 'Early or Next of a Kind' deals are valuable in establishing and testing financial models and building experience of the management of the project, in this case, fishery transition. The early deals are likely to attract only small, specialist investors and they will require high financial returns in compensation unless they are impact investors, so it seems likely that impact investors have a crucial role to play at the early stages. At this early stage, government institutions and multilateral development banks have an important role to play as pilot programmes will need heavy public involvement to defray the costs of setting them up. Other investors may then follow, if they can see a pipeline of sufficient deal volume and quality emerging. It will require some effort on the part of some participants, perhaps development banks, other international financial institutions, NGOs or impact investors, to develop this pipeline. It seems unlikely that private investors would bear much of the costs of this market development activity.



A credible party is needed to coordinate the participation of investors. With all these possible investors and a variety of structures to choose from, there may be a role for a co-ordinator or facilitator to invite all the investors to the table, to encourage the participation of some and to discourage others, and to propose the fundamental structure of the vehicle. This person does not need to be the leading equity participant, but they could be, and they should certainly be experienced in this role and highly knowledgeable about fisheries, finance and familiar or willing to become deeply familiar with local politics. Personnel with an investment banking or private equity background might be suitable in the role, so long as they are sensible to the policy objectives and public interest purpose of the investment.

Figure 3. **Innovation path in fisheries finance**



Source: Vivid Economics

6 Role of public capital

Securing public benefits and showing public commitment

The purpose of public capital participation is to obtain returns to society which commercial investors would not value. Like all forms of public intervention, public capital participation may be tied to social objectives: to deliver the public goods that private markets fail to deliver and to emphasise the long-term in contrast to the short-term focus of many private participants. Although some of these benefits may be secured through the considered drafting of the constitution of the investment vehicle, the strong participation of a public investor whose clear aims are to achieve these societal objectives will make a difference to the outcome.

The public investor may accept some returns in non-pecuniary form. While the public investor may value the public good outputs of the investment, private investors by and large will not. A public investor may choose to be satisfied by a blend of non-financial outputs and financial returns on its investment, while a private investor, other than the small but important class of impact investors, focuses almost exclusively on the latter. Hence a public investor may be willing to accept a lower return on their investment and subscribe their capital at a concessionary rate, in return for non-pecuniary conditions, such as environmental protection measures, the long-term constitution of the investment vehicle, the inclusion of long-term capital projects within the programme of investment, the publication and dissemination of information on the project and/or the participation of strategic co-investors who might re-use the lessons from the scheme in future investments.

A lower return may be structured in several ways. A public body might provide some equity in the form of a capital grant, enhancing returns for other investors, or it might pay directly for the project development, that is the phase of a project which a project developer would otherwise do and expect to be remunerated for, or might underwrite risks through a guarantee. These three options differ in the participation during the development phase. Under the capital grant, other participants would be involved and each may be required to contribute some capital, albeit maybe a small amount, in order to have some interest in the outcome. Under directly funded project development, no third party participation occurs and the public body has full control, much reducing the input from third parties who might later become co-investors. A public body might also provide equity in the form of a specific guarantee or insurance, absorbing certain risks in return for a concessionary fee. These ought to be risks over which the public body has some control or expert knowledge. The obvious candidate for a guarantee is political commitment to the project through the setting of science-based TACs and the integrity of the fisheries management regime. If a form of words and means of triggering a guarantee can be found, then the public body might play a useful role in transferring these risks out of the investment vehicle. Finally, a public body might contribute concessionary subordinated debt. This debt has equity-like features in that it receives income only after the ordinary debt has been paid. It effectively reduces the gearing of the project, but by offering this cushion at a concessionary rate, it achieves the same effect as more equity, which is to reduce the cost of debt, without the potential tax disadvantage and without the higher return that equity demands.



Public investment agencies, public insurers or public investment banks may be available. The roles suggested above might be fulfilled by existing local public institutions whose role is to make public co-investments in infrastructure, to write public guarantees and insurance, or to coordinate investor participation, to arbitrate between investors and to advise on project development. Sometimes these exist in the form of a national institution and sometimes they operate supra-nationally or regionally.



7 Integrated support for transition

Maximising value for money by leveraging the supply chain

Having touched on the role of finance, its structure and participation, now it is time to consider wider questions. First, in this subsection, the discussion turns to the broader system of fisheries improvement in place locally, within which finance plays its role. Second, in the next subsection, the debate moves to the geographically broad development of fisheries financing globally, in which individual cases have a role to play.

The choice of management system may affect the long-term performance of the fishery. Although the effective control of the catch may, on its own, achieve the desired effect of building the stock, the way in which it is implemented could affect the productivity of the catching sector. The greatest productivity over time will be achieved by a system that encourages fishers themselves to invest in the best catching technology, to disinvest old vessels and gear, and to support management activities that directly benefit their industry, such as stock assessments, monitoring and enforcement. Not infrequently there is a role for government, on behalf of all fishers, to experiment with new techniques and to find ways to introduce and disseminate best practice, in the design of gear and its use, in safety practices and in product handling. An effective management system encourages these wider developments.

The natural capital base provides the opportunity, the supply chain adds value. The value added by human endeavour through labour and capital includes port infrastructure, product handling and logistics, and product auctioning or sales. Further down the supply chain, value is added by product processing and distribution and consumer market development. The total value created by improving the productivity of the natural capital, the biomass, reflects the systematic enhancement of the whole supply chain, involving appropriate investment along its length. The private sector may bring forward much of this investment without much encouragement from government, but it is likely that coordination of investment plans along the supply chain will lead to a speedier response and investment decisions which are better informed by the intended actions of others. Furthermore, there are parts of the supply chain where stronger government intervention may be needed for one of several reasons. First, places where government owns or licenses the assets, such as port and road infrastructure and decisions related to investment come under its direct control or influence. Second, places where there is potential for bottlenecks in the supply chain, bottlenecks whose control might give some individuals the power to cream off rents from the sector, starving other parts of the supply chain of the income or margin they need to invest. The government can move to encourage competition or to regulate pricing to prevent this from happening. Third, government can step in and coordinate or lead action where several parties support action, and have an interest in the action taking place, but they have no means to fund the action collectively because they are competitors or because there are too many of them to make cooperative action easy. An example is the government promoting the product and brand to export markets, which rival exporters cannot do themselves and which the supply chain might not easily act collectively to achieve.



Fishers' support for reforms is crucial and reforms may fail without it. The technical design of reforms, the management systems and the finance are not sufficient without the support of fishers and for this reason, action to consult, influence and garner support from fishers is an essential part of reform, and one which may be most effective if begun early, when the broad objectives of reform are determined. It is likely to take time and to involve grass roots discussion with individual fishers and society leaders. It deserves a well-developed plan within the overall transition strategy, and although it is not discussed in any detail here as we focus on other aspects, it would be included in the timetable and costings of the transition.

Cooperatives may play a pivotal role. Cooperatives have the capability to pool the resources of fishers or processors and could achieve the scale needed to undertake relatively large programmes or investments, indeed, they may be able to raise finance themselves. In order to take on this role, a cooperative will need a professional management and governance system and in some cases, it will take government and external advisory support to establish these internal resources within a cooperative. Some thought may have to be given to the formal relationship between government and the cooperatives and whether it is better for them to act completely independently or whether there is some degree of policy involvement, for example, setting a framework within which the cooperative acts, establishing its objectives and auditing its governance systems.

The investment commitments being made along the supply chain may be reflected by long term contracts from seafood companies. In a fishery that is becoming well managed, the catch available becomes more certain and the supply chain becomes more integrated. One of the features which might develop is the practice of writing long-term contracts between seafood companies (exporters) and fishers or processors. These contracts give more price certainty along the supply chain and the commitment they offer between parties might help to encourage investment up and down the chain, to the benefit of product quality and cost efficiency. Such contracts also allow direct specification of product size, quality, place of catch and gear used, which can, if done well, support, enhance and go beyond the requirements of the management regime.



8 Developing the market for fisheries finance

Wide adoption through demonstration projects and standardisation

All of the elements described above together may have a positive impact on the planet's fisheries if they can be developed and made widely available. The actions taken in an individual fishery and in particular the role of any external financiers should not be considered as isolated but rather part of a programme of developing the finance market in fisheries. A programmatic approach considers how many projects will be running and when they would take place, what resources are needed and what the ultimate scale would be. These are programme-level questions of concern to international financiers of all types. The answers might include programmatic solutions such as a Blue Investment Bank housed within the World Bank or a similar institution designed to play a particular financial and policy support role as outlined before. A pilot phase of several deals, led by multilateral development banks, could be established to test the approach and the financial products. The more projects that are developed, the greater the incentives by governments to reduce risk and create favourable enabling environments for investment in the sector.

There are a number of financial models of participation and products to be developed if the fisheries finance market is to achieve scale. These include models for intermediation between large scale investors and small fisheries projects and, flowing in the opposite direction, the aggregation of demand for finance to a scale which supports the efficient supply of finance. They encompass risk mitigation products such as guarantees and risk sharing or credit enhancement mechanisms such as subordinated debt and capital grants.

As the financial structure, product and commercial designs mature, standardisation may further drive down costs. Over time the new approaches will be refined and become better understood. It may be possible to establish new standards within fisheries finance, perhaps reflected in product trade, such as through a 'sustainable finance letter of credit' (which now exists in other sectors through the work of the Cambridge Banking Environment Initiative), with a line of account up and down the finance chain. These standards could operate at a global scale, given that fish products are heavily traded across borders, and could include global access to IT systems and potentially the establishment of not-for-profit stewardship and governance of the standards themselves.

The finance market would benefit greatly from experiences learned in individual cases as the portfolio builds up. One way to facilitate learning is to establish a repository of examples, recording their successes and failures and including copies of their documentation including laws, regulations, articles of association, contracts and policies. The legal documentation can act as templates for future cases, helping to reduce set-up costs. In addition, the publication of the costs of management would greatly assist budgeting for new management systems in fisheries as currently the management cost information is quite patchy. The opportunity for learning is created by the publication of information and transparent data, performance and administrative arrangements. Transparency is a prerequisite of learning, of standardisation and of the process of rolling out fisheries reforms globally, so there is scope for some thinking at programme-level about what



information could be collected, how its collection might be standardised and through what platform it could be made available for sharing.

Financiers will want to know where the deals are. Financiers considering moving into fisheries finance will want to make a dispassionate assessment of the deal flow, that is, the number, size and quality of the financing deals that might appear and in which the financier might participate. There may be value in preparing an analysis that tests and screens the prospects for fisheries transition and its finance globally and updates this assessment regularly so that financiers do not each have to bear the costs of this exercise themselves.



9 Lessons from case studies

The return on investment is higher in Belize than in Indonesia

The management systems already in place in Belize have had some success in stabilising and rebuilding the conch population but have had not increased lobster numbers so far. Both fish stocks appear to be below their optimal level and so it is possible that the value of the fishery could be about two times if judicious investments are made. For every US\$1 of wise investment in this fishery, US\$2 of benefit is created. Patience and cooperation are needed. The process will take four to eleven years and possibly longer. It may take up to a generation to build the stock to its optimal level and then to pay back the capital invested, with interest, but if this is done and maintained, it will generate an enduring surplus for those working in the supply chain, in particular fishers, and for the government.

In Indonesia, on the other hand, the paucity of current management capability has overseen a rapid expansion and then decline of the catching sector, putting the blue swimming crab population in South Sulawesi under pressure. The fish stock is well below its maximum sustainable yield level and the value of the fishery could be doubled with judicious management and a willingness to reduce catches for around three or four years. Similar to Belize, for every US\$1 of wise investment in this fishery, US\$2 of benefit is created. Once the stock is rebuilt and maintained, fishing incomes will be much higher and there will be an enduring surplus for those working in the supply chain and for society.

These investments could be financed with the help of a range of financial parties. While in Belize the indications are that the returns on offer may be sufficient to finance some of the structure on commercial terms, it is not yet clear whether this is the case in South Sulawesi since the management cost estimates there are more uncertain. Some grant or concessionary finance would be necessary in both countries to fund initial steps to stabilise the fisheries and to demonstrate effective management and revenue recovery mechanisms.

The case studies suggest a number of candidate options for funding the investment. They range from: local fisher participation, aggregated through cooperatives; government sponsorship, through a management authority and perhaps a shift to secure tenure (rights based management); and international finance from donors and international financial institutions, accompanied by technical assistance. Other combinations of these funding parties might also be possible. Belize already has cooperatives in place, but without the resources and capabilities to take on a financial role. In Indonesia, the current institutional arrangements appear to be fragmented and immature, and there is further work needed to explore how current institutions might take on management roles and might work alongside a financial entity or might provide a conduit for finance.

Both case studies also show what it takes to make an investible fisheries improvement project. The pieces are:

- a track record of scientific and management data;
- proven management success using respected management approaches;
- an integrated bio-economic-financial model used for assessing and characterising risks, informing a risk mitigation plan; and
- an appropriate financial entity, structure and group of financial participants.



The best estimates indicate that it may take three to four years for the biomass to return to a sustainable level in Indonesia and up to eleven years in Belize. In Indonesia, the biomass is expected to be four times as large as its 2012 level at MSY, because it is currently so low. Catch per unit effort is estimated to increase by around 270 per cent compared to 2012 level. In Belize, the biomass of lobster is expected to double to achieve MSY, while conch is much closer to its MSY level, revealing the benefit of existing management and the remaining opportunity through transition. The catch per unit effort is predicted to increase by 50 per cent compared with the 2010 level for conch and 100 per cent for lobster.

The central financial scenario assumes management operating costs of US\$1.7 million per year in Indonesia and US\$0.95 million per year in Belize. The total implementation cost of the reform programme is estimated to be US\$3 million in both case studies. The uncertainty in estimating management operating costs is higher for Indonesia than for Belize.

The potential investment revenues are estimated to be higher for Belize than for Indonesia. In Indonesia they come from a 40 per cent share of total fishing revenues and are estimated to be US\$6.2 million per annum when catches are at their MSY level, compared with illustrative US\$3 million in 2012 and US\$2.3 million if the fishery were to be stabilised but not rebuilt. In Belize they come from a 25 per cent share of total fishing revenues and are estimated to be US\$11.5 million per annum when catches are at their MSY level, compared with illustrative US\$10 million in 2010 and US\$6 million if the fishery were to be stabilised.

The return on investment is expected to be higher in Belize. The total return on the investment is expected to be real 7 per cent. In Indonesia, the most likely estimates of the bio-economic model suggest a total real return on investment to be around 6 per cent. In order to boost returns on equity, enhancement from capital grants is considered in both case studies, at the level of US\$1 million each.

The central scenario for Indonesia reduces the number of fishermen required to harvest the available catch from 1,500 in 2012 to 360 in 2015; whereas in Belize they fall from 1,850 in 2010 to 890 in 2015. The lowest number of fishers required to harvest the available catch in Indonesia is estimated at approximately 410 in 2016 until the fishery starts operating at MSY, when the number increases to 990. In Belize, the lowest number of fishers is estimated at approximately 400 in 2019, but when the fishery operates at MSY, the number increases to 850. **In both cases, when the biomass is rebuilt, fishers' total income increases by 8 per cent compared with 2010, and by 180 per cent increase compared with their income under the stabilising scenario.**

The uncertain biomass rebuilding rate is the main risk factor for prospective investors for both countries. In Indonesia, models with low intrinsic growth rate cannot generate positive equity NPV, even at high profit sharing rates. In Belize, models with a low intrinsic growth rate generate adequate equity return only when a revenue sharing rate of 35 per cent or more is applied and catches are reduced hard during the transition phase, by 50 per cent relative to their 2014 level.

The level of IUU fishing plays an important role in investment returns. If IUU fishing is removed in Indonesia, the return on investment increases from real 6 per cent to 8 per cent, and fishers' income NPV increases by US\$2 million. In Belize, the return on investment increases from real 7 per cent to 9 per cent, and fishers' income NPV increases by US\$ 3 million. This shows the value of effective monitoring and enforcement of access and landings.



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Company Profile

Vivid Economics is a leading strategic economics consultancy with global reach. We strive to create lasting value for our clients, both in government and the private sector, and for society at large.

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