

A Research Framework on Value Chain Analysis in Small Scale Fisheries

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Abstract

In the Philippines, small-scale fisheries, as common pool resources, remains beset by the problems of resource degradation and widespread poverty in coastal communities. Even as open access persists in most of the country's fishing grounds and state policies are unable to catalyze the development of an efficient and sustainable fishing industry, community-based coastal resources management (CBCRM) approaches centered on property rights are being increasingly adopted by fisherfolk and non-government organizations as both tactical necessity and strategic imperative.

With the CBCRM movement in the Philippines entering its second generation, there have been both successes and failures. There have been substantial gains in the area of resource conservation especially with marine protected areas as one of the main strategies being employed. However, this stands in stark contrast to assertions of small-scale fishers that they do not benefit economically from their crucial role in coastal resource management. In their own words – “the fish have come back but the buying price in the market has dropped so we're no better off than we were before”.

This dilemma of market disempowerment is further embedded in the phenomenon of rapid global economic integration, which if not properly managed, threatens to exacerbate the plight of

coastal communities. Specifically, there are dangers of unsustainable production spurred by the strong demand of global markets and breakdown of emergent community property rights regimes due to the pressure to privatize resources.

To address this situation, organized fisherfolk and their support organizations are giving added emphasis on livelihood and enterprise initiatives at the community level. These initiatives, firmly rooted in CBCRM, would work towards the economic engagement of fisherfolk with both local and distal markets in their own terms. This means development of value-added fishery products and marketing systems to foster their participation in the national and global economy if they so choose, taking into account the optimal balance between production for local food security and for the market.

To deepen the investigation into the situation of small-scale fishers vis-à-vis other economic players at the local, national and global level, value chain analysis will be utilized as a tool from which to develop a framework that can inform both the development of local livelihood and enterprise initiatives and the formulation of appropriate public policy. Such framework would sketch a broad outline of fisheries as an economic sector and serve as basis for more detailed studies on selected fisheries, the production and marketing of which is crucial to small-scale fishing communities specifically tuna, shrimp and small pelagic species.

Value chain analysis would focus on the dynamic of interlinkages in the fishing industry and describe the full range of activities required to bring fishery products from capture/culture, through the different phases of production and delivery to final consumers. It will deepen inquiry into the disjuncture between high levels of economic integration into national and global product markets and the extent to which countries and people actually gain from such integration.

Introduction

Small Scale Fisheries in the Philippines

The Philippines is a nation of fishers. Government estimates those directly employed in fishing to be one million with approximately six million of the household population dependent on fisheries for their livelihood. With total territorial waters of 2.2 million square kilometers and a coastline length of 17,460 kilometers, utilization of its fishery resources has enabled it to produce 2.9 million metric tons of fish, crustaceans, molluscs and aquatic plants in 2000 and become 11th in fisheries production in the world (BFAR 2002).

But all is not well. Numerous studies reveal resource depletion due to overfishing as well as degradation of the aquatic environment i.e. destruction of corals, mangroves and seagrass beds, and water pollution from industrial, agricultural and domestic sources (Israel and Roque 1999). This situation goes hand in hand with the poverty of artisanal fishers (including commercial fishing crews and aquafarm workers), majority are whom live below the poverty threshold. Their plight is attributed to the low productivity of aquatic resources mainly due to resource depletion and environmental degradation, low productivity or lack of access to land resources, resource use conflict particularly in nearshore waters and lack of basic social services (Perez and Cruz 1997).

This state of affairs is circumscribed by legal and institutional constraints centered on the persistence of *de facto* open access to fisheries and coastal resources. Although these resources are *de jure* state property, weak implementation of existing laws and policies have led to resource conflicts and virtual privatization by commercial interests who have the capital to exploit the resources to unsustainable levels (De la Cruz 1994).

In response, communities and non-government organizations have increasingly adopted community-based approaches to coastal resources management defined as a process by which residents of a coastal community are provided the opportunity and responsibility to manage their own resources; define their needs, goals and aspirations; and make decisions and take actions affecting their well-being (Pomeroy and Carlos 1996).

One of the key underpinnings of CBCRM is the concept of community property rights defined as the various claims enforceable by an institution holding and exercising authority under a system of rules that individuals or groups hold against one another with respect to the use of a particular resource (Barbers and Jacinto 1997). Taken as a bundle of rights consisting of use rights, exchange rights, management scheme, distribution entitlements and authority instruments, advocacy for community property rights would serve as both as measure of advancement as well as an end goal for CBCRM. This can be concisely described as well defined property rights to coastal resources in the hands of stakeholders who would take all the consequences of their resource allocation and use decisions and are more likely to be more cautious and prudent in exploiting the resources (Cruz 1999).

Objectives of this Paper

This paper seeks to develop conceptual links between value chain analysis as a tool for inquiring into institutional arrangements and distributional outcomes in small scale fisheries, and community property rights as an increasingly workable option for coastal resources management. It will initially focus on the top three exports in Philippine fisheries namely tuna, shrimp and seaweeds as means to assess the applicability of value chain analysis on specific commodities as they relate to current situation of production, ecosystems and communities.

Value Chain Analysis and Globalization

The value chain describes the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers and final disposal after use (Kaplinsky and Morris). In reality, value chains tend to be extended with a whole range of activities within each link and links between different value chains. Despite this inherent complexity, value chain analysis can deepen inquiry into the disjuncture between high levels of economic integration into national and global product markets and the extent to which countries and people actually gain from such integration.

Value chain analysis can be a useful analytical tool in understanding the policy environment in terms of efficiency in allocation of resources within the domestic economy while at the same time understanding the manner in which firms and countries are participating in the global economy (Kaplinsky and Morris). Analyzing value chains can bridge the gap between the focus of mainstream economics on aggregate measures of poverty such as income and the stress of livelihoods perspectives on micro-level complexity (Kanji and Barrientos 2002). These two perspectives tend to view the purported benefits of trade liberalization differently with the former being positive and the latter generally less so.

In the context of fisheries, increased trade poses a significant risk to valuable ecosystems, but on the other has great potential as a source of desperately needed income for local fishing communities. Trade can enhance employment and income generation, both directly, and through multiplier effects, in developing countries but of equal importance is the need to consider distributional impacts of trade to ensure that it is poor producers who actually reap the economic benefits of trade rather than mere increase in macroeconomic indicators (Macfadyen et al. 2003).

On the other hand, there are those who hold the dim view that, particularly in Southeast Asia, current fisheries management and export regimes are resulting in reduced availability of fisheries products, undermining local food security, and have incurred costs to local economies and domestic natural resources that exceed gains in export earnings (Van Mulekom et al 2004).

Clearly, a tightrope must be walked in building links between sustainable livelihoods at the community level and external (and even domestic) trade that are beneficial to artisanal fishers and coastal communities.

Overview of Major Fisheries Commodities

Tuna

The Philippines is one of the world's top tuna producers ranking third with a production of 343,529 metric tons in 2000, which accounted for just over six percent of global production. In 2002, tuna was the Philippines' top fishery export in terms of value with FOB value at USD 145,156,000 from a volume of 72, 296 metric tons. Major export destinations include the United States, Japan, Germany, Canada, Singapore, Hong Kong and Taiwan.

Table 1. Philippine Tuna Exports 2002

Form	Volume (in metric tons)	FOB Value (in 000 USD)
Canned	47,970	93,173,000
Fresh/Chilled/Frozen	23,621	50,648,000
Smoked/Dried	705	1,335,000

Bureau of Fisheries and Aquatic Resources

Tuna catches have been relatively stable from 1987 to 1996 but a noticeable trend is the increasing share of commercial fishing operations relative to small scale fishers (Tambuyog 2000). Commercial fishing operations accounted for sixty-eight percent (68%) of tuna production in 1996, up from fifty-four percent (54%) in 1986.

The contribution of tuna to total fishery exports has likewise been stable over the last decade hovering at around forty percent (40%). Meanwhile tuna imports have ranged from 15% to 25% of total imports over the same period. In terms of volume, approximately two-thirds and one third were accounted for by canned tuna and fresh/chilled/frozen tuna respectively while smoked/dried tuna contributed less than one percent of the total.

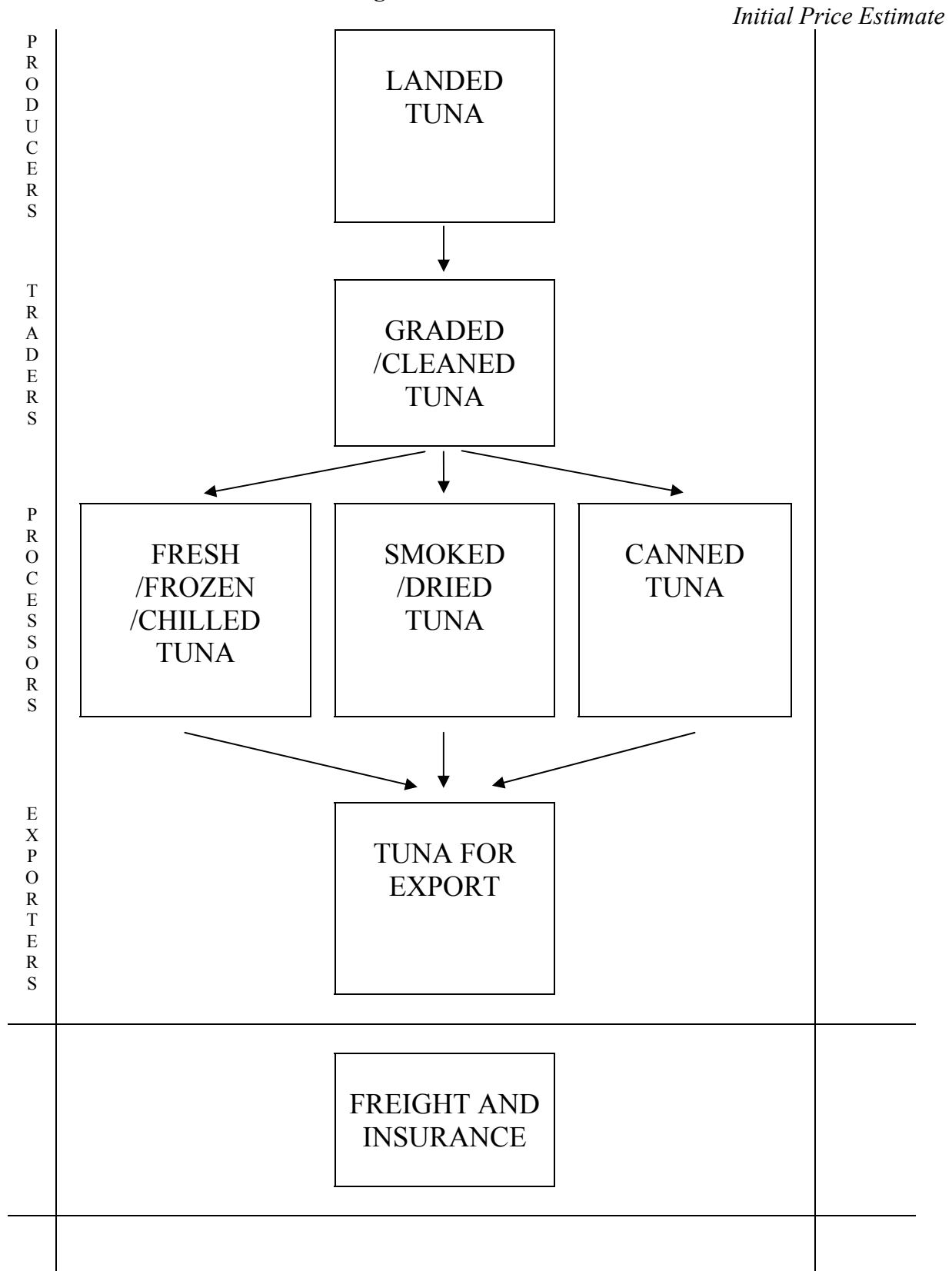
In the export value chain for fresh/chilled/frozen yellowfin tuna bound for the Japanese market, producers usually receive less than fifty percent (50%) of what the exporter obtains because it is

usually the exporter who financed the fishing trip and uses this as leverage in setting the buying price (Tambuyog 2000).

While canneries who produce for both local and export markets obtain catch from purse seine operations, those who export fresh/chilled/frozen tuna mainly get these from handliners who, as a group, have long viewed themselves not as commercial but as medium scale fishers. Although classified as commercial scale because they are above the official threshold of three gross tons, they have often lobbied for special consideration referring to the traditional manner (handlines) by which they catch tuna.

It is also true that the economic status of the crews of these vessels does not differ much from typical small scale fishers and may even be more vulnerable given the sheer distances they must traverse to get to their fishing grounds. While the operators of these fishing vessels are well-off because of boat ownership, which entitles them to the lion's share of the catch, the handliners themselves do not benefit much from the exorbitant prices that their catch obtains in distant markets. Apart from the particular situation of handline crews, most commercial fishing crews whose tuna catches end up in export markets obtain marginal economic benefit from their involvement in fishing operations.

Figure 1. Tuna Value Chain



Shrimp

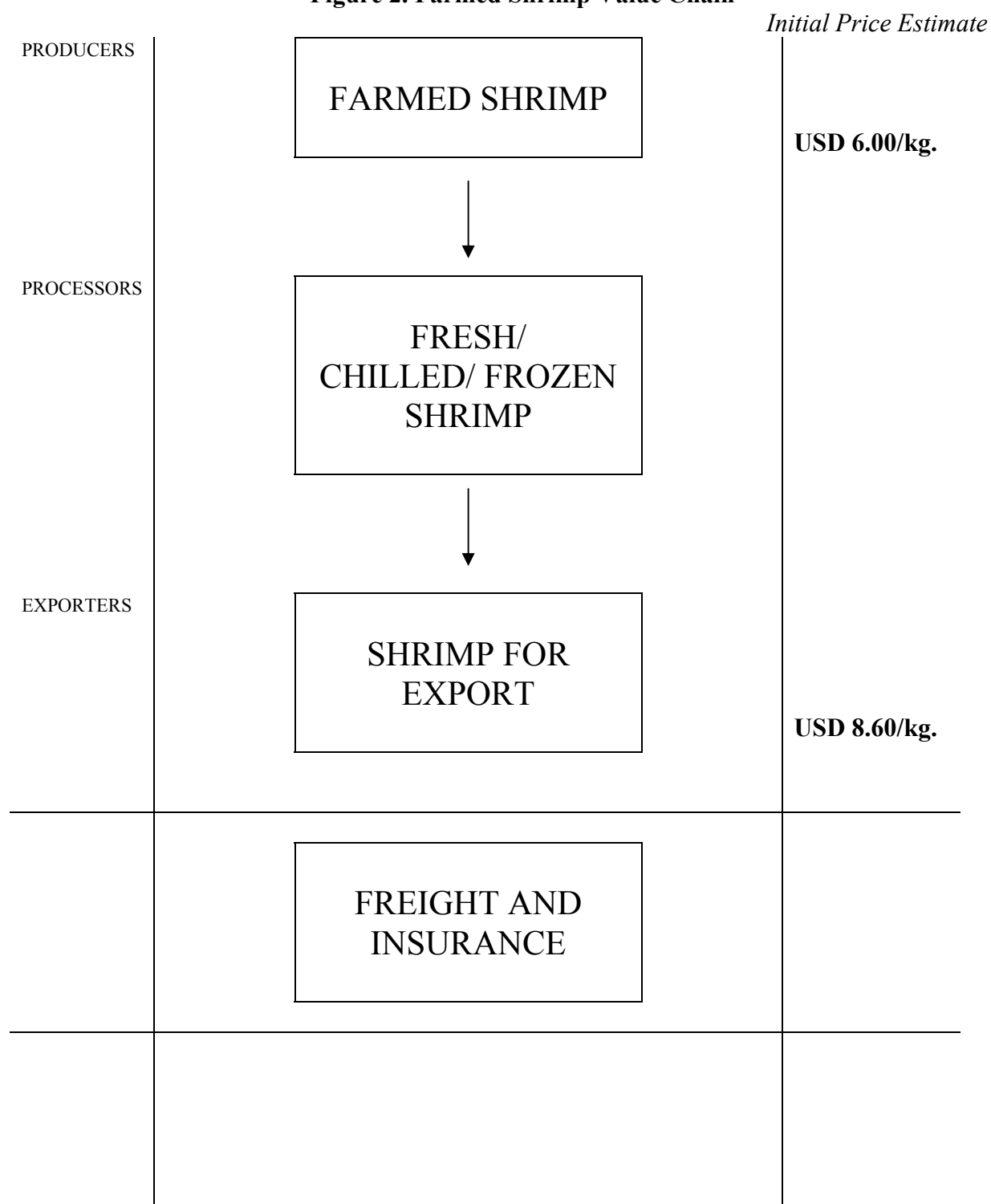
In 2001, the Philippines produced 59,129 metric tons of shrimp and prawn of which 41,448 metric tons (69%) were tiger prawns and 42,295 metric tons (71%) were from aquaculture. In 2002, the Philippines produced 37,480 metric tons of shrimp and prawn of which 16,919 metric tons were exported at a value of FOB USD 140,850,000 making for forty-five percent (45%) of total production. Major export destinations were Japan, Spain and the United States.

Over the past two decades, aquaculture, particularly shrimp farming, has been the focus of government incentives such as tax holidays and duty-free importation of capital equipment to increase export revenues by catering to the international demand for shrimp. The trend continues to this day with the implementation of its Aquaculture for Rural Development ostensibly to foster countryside development and address food security (Velasco et al 2003).

However, looking back at what shrimp farming has wrought in fishing and coastal communities reveals an unmitigated social and environmental damage. Mangroves forests were cleared to give way to brackishwater ponds for shrimp culture that resulted in displacement of small scale fishers from their traditional resource base. Socioeconomic costs include lost ecosystem services provided by mangrove forests, privatization of common resources, increased conflict over and degradation of land and groundwater resources, and increased food insecurity resulting from prioritization of resource utilization for export over local food needs (Sepulveda 2003).

Shrimp farming for export is perhaps the most glaring example of social and environmental costs borne by small scale fishers and coastal communities so that consumers in developed countries can have meet their increasing demand for cheap and affordable shrimp.

Figure 2. Farmed Shrimp Value Chain



Seaweeds

The Philippines ranks third in the world in seaweed production after China and Japan with production of 785,795 metric tons in 2000 with this figure rising to 894,856 metric tons in 2002. Also in 2002, seaweeds were the top fishery export in terms of volume at 40,258 metric tons and third in terms of value at FOB USD 72,666,000. Major export destinations were France, the United States, Denmark, Japan and the United Kingdom.

Table 2. Philippine Seaweeds Exports 2002

Form	Volume (in metric tons)	FOB Value (USD)
Seaweeds and Other Algae	31,098	34,135,000
Carageenan	7,928	38,081,000
Seaweeds and algae used for food	142	173,000
Kelp powder	1,090	277,000

Bureau of Fisheries and Aquatic Resources

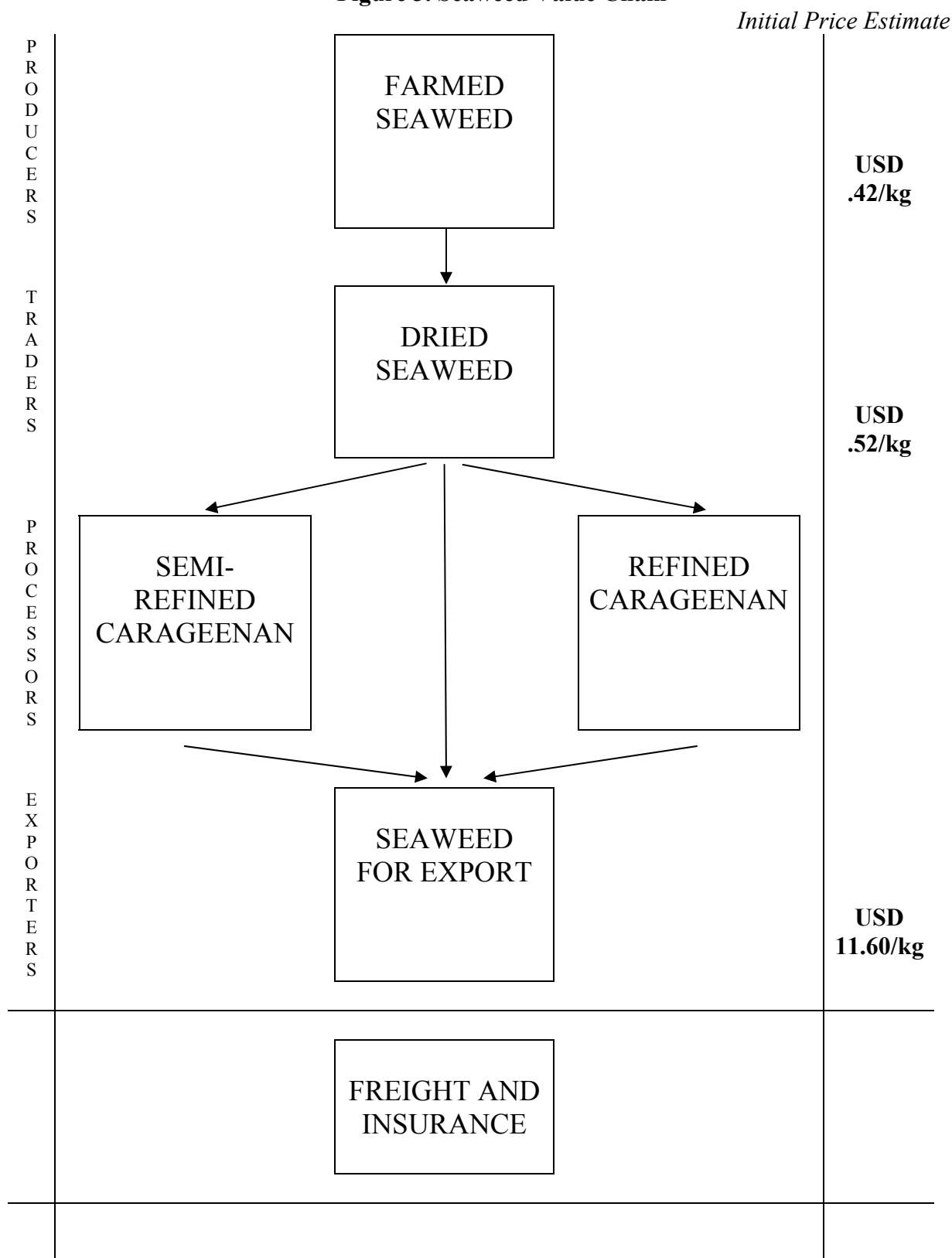
Seaweeds (*Eucheuma*) is a raw material for the processing of carageenan, a food and industrial additive used as an enhancer, emulsifier, gelling agent, thickener, binder and stabilizing agent in many meat, dairy, bakery, pharmacological and industrial products.

The value of seaweed (including carageenan) exports grew from USD 8.4 million in 1980 to USD 51.2 million in 1990 to USD 72.6 million in 2002. Fifty-eight percent (58%) of production is processed into semi-refined carageenan, thirty-one percent (31%) are exported raw (dried) and the remaining eleven percent (11%) is processed into refined carageenan (BFAR 2002).

The Seaweed Industry Association of the Philippines (SIAP) projects further growth for seaweed processing and export with current constraints being high production costs, lack of technological upgrading, inadequate supply of seaweeds for processing and increasing competition from other seaweed exporting nations.

There are an estimated 100,000 seaweed farmers who sell dried seaweed to traders who in turn sell these to exporters and processors. From their perspective as small producers, seaweed culture issues revolve mainly around low buying prices, effects of diseases and decreasing water quality on their crop, and local peace and order. The effects of environmental degradation are often immediate and severe as successful seaweed culture depends on healthy coastal ecosystems. Local peace and order is a prominent problem given the concentration of seaweed farmers in the Sulu-Zamboanga area which has more than its share of illegal, and sometimes insurgent, activity.

Figure 3. Seaweed Value Chain



Addressing Social and Environmental Costs

Realization of community property rights is seen as an effective response to the problem of open access which has historically led to resource depletion and environmental degradation (De la Cruz 1993). A positive outcome associated with the realization of community property rights is the likely reduction of externalities i.e. social and environmental costs that are not internalized by producers but are rather borne by the community as a whole, an example of market failure wherein prices do not truly reflect the real cost of production (Batker and Genciano 2003).

In practice, emergent community property rights regimes in the Philippines have managed to address open access, encourage more sustainable utilization of resources and internalize at least some social and environmental costs (Vera et al 2003). A longer term goal is the achievement of long term production stability of nearshore fisheries premised on optimal resource utilization that would result in more equitable economic outcomes and increased leverage vis-à-vis external markets. Long term production stability would be an accurate gauge of sustainable utilization as it would be recognition of resource limits on the part of producers perhaps best exemplified in the historical development of Japanese coastal fisheries (Yagi 2003).

Thus community property rights would be the foundation for a community-based management system that could effectively address open access and externalities by bringing cost and benefit decisions together (Ribot 1997). Further, they would also be in a better bargaining position in terms of building external market linkages and negotiating with potential external investors.

However, it must be qualified that geographical expansion of trade increases the number of individuals makes local communal institutions more difficult to form and maintain including the resultant increase in transaction costs (Costanza 1997). Another factor that could hinder the internalization of external costs by community property rights regimes is the (lack of) local accountability of political representation in the community (Ribot 1997) – essentially the quality of local resource governance.

Directing production towards external markets has accounted for both positive and negative effects on communities. On one hand, there are benefits for the community mainly in the form of increased income although this is often captured by local elites. On the other hand, demand tends to accelerate resource extraction to the point of resource depletion and ecosystem degradation (La Vina 2002).

In the Philippine context, a formidable threat looming in the horizon for fisherfolk and coastal communities is the possible entry of foreign investments in nearshore fisheries. This has become plausible given the redirection of government policy from capture fisheries towards aquaculture. This emergent bias can be correlated to the recent high production growth rates for aquaculture in relation to both municipal and commercial capture fisheries. Aquaculture is viewed as a “sunrise” industry that must be considered a development priority.

Coupled with the view that the Philippine Constitution inhibits economic growth by restricting investments in natural resource utilization to its own nationals and the emerging trend in global fisheries towards aquaculture (Delgado et al 2002), there is a fair chance that investment liberalization advocates will push for policy change that would remove these constitutional restrictions and unfetter aquaculture growth through foreign investments.

Such a scenario is likely to result in massive negative impacts on fishing communities in the Philippines given the widespread poverty and resource degradation that characterizes the sector. These communities are not likely to benefit in terms of gainful employment from these capital intensive ventures nor will they be spared from the externalities that may be the likely result given the inability of government to enforce environmental regulations.

Notwithstanding efforts by the fisherfolk themselves to forestall this eventuality, the maturity of CBCRM efforts into workable and viable community property regimes can mitigate the worst effects of investment liberalization and by itself act as a safety net that “would minimize the threats posed and maximize the opportunities provided by these challenges” (La Vina 2002).

Apart from addressing externalities, community property rights is expected to exert a “ballast” effect on the fisheries value chain by laying the basis for long term production stability. Such an effect would render production more predictable, reliable and, from the point of view of investors more “bankable”. From this, producers could work towards enhanced market leverage as they relate with traders, processors and exporters.

Vertical Integration of the Fisheries Value Chain

A comprehensive approach would be to build consensus among different stakeholders in the fishing industry on the necessity for vertical integration. This would address the problem of the fragmentation of the small-scale fisheries sector.

At the level of the community, a large majority of small-scale fishers still operate alone and are not affiliated with any organization. This weakens not only their socioeconomic position but also affects performance of fisheries as an economic sector (FAO 2004). This position makes them vulnerable in bargaining with other market actors such as operators who have better capital endowments, traders, processors and exporters. This situation is further aggravated by the lack of transparency in the price formation process and asymmetric information flows, lack of capital for investments in improved technology, and inadequate postharvest infrastructure especially the lack of cold chains that is vital to fishery products (FAO 2004).

At this point, it appears crucial for fisherfolk to develop resilient community institutions that can withstand the rigors in winning the fight for community property rights, and resolving problems such as lack of access to market information and capital. This will involve engagement with both local and national governments, and collaboration with like-minded stakeholders such as non-government organizations (NGOs), and academic and research institutions.

Another potentially fruitful arena of engagement for producers is to deal directly with enterprises that are open to economic collaborations through mechanisms such as community-company partnerships that have met some success in the forestry sector (Mayers and Vermeulen 2002).

In the Philippines, the Seaweed Industry Association of the Philippines (SIAP) boasts of the vertical integration of the refined carageenan value chain from raw material to finished product. Nevertheless, the majority of seaweed farmers, most of whom are small-scale, household-based producers, are unorganized and ill-equipped to negotiate for better prices and a larger share of the profits from seaweed exports. Well-articulated property rights over resources and robust community institutions could substantially alter the current market configuration and shift the balance towards small producers in terms of both governance and distributional outcomes in the value chain.

Determining the Real Price of Fisheries Products

While advocacy for community property rights and vertical integration are possible elements of an approach that could result in more equitable, sustainable and empowering arrangements for small-scale fishers, a strategic concern that deserves serious attention is the current “underpricing” of fisheries products both in domestic and foreign markets.

This assertion rests on the analysis that with the current situation in the Philippines wherein property rights are poorly articulated and communal management institutions are weak or virtually, externalities abound in the form of social and environmental costs borne by those who are least able to cope with such market failures.

Specifically, this perspective avers that final consumer prices, whether domestically or internationally, do not reflect the true cost of producing fishery products as long as externalities are not made to “show up” in the value chain. With social and environmental costs missing from the equation, what is actually expensive and wasteful becomes apparently cheap. The much employed Cobb-Douglas production function often used by economists and development planners measures only labor and money as inputs and does not take into account the value of natural resources as well as the degradation of such resources resulting from the economic activities in question (Batker and Genciano 2003 as cited in Van Mulekom et al 2003).

On the other end of the value chain, which is the locus of underpricing, small producers, although the main users and custodians of the resources, do not earn enough from their production to give them incentive to utilize and manage these resources sustainably (BRIDGES Trade Biores 2003). Governance and distributional outcomes are often skewed to the advantage of traders, processors and other intermediaries resulting in the marginalization of small producers. Current schemes to pay premium prices for products from sustainably managed resources are deemed insufficient to improve the livelihoods of small producers and render their shift to more sustainable production practices worthwhile. There is need for mechanisms that would pay small-scale fisheries not only for the value of their fishery products but also for positive externalities such as conservation of biodiversity and maintenance of ecosystem services.

Apart from increased household income for small producers as environmental stewards, policy instruments can be employed at the local and national level when and where appropriate to reward environmentally responsible behavior practices and to impose sanctions on unsustainable ones. This can come in the form of natural capital depletion taxes, environmental assurance bonds and even ecological tariffs (Costanza 1997) that would not only potentially reduce social and environmental costs but also set aside financial resources to address these should they nevertheless occur. However, the adoption and implementation of this approach is premised on successful advocacy with state, market and community institutions at the local, national and international levels.

Although access to scarce natural resources as a barrier to entry is deemed exogenous to the value chain (Kaplinsky and Morris), there may be need to revisit this assumption given the crucial role of resource rent and externalities in the dynamics of the fisheries value chain. The nature of fisheries as common pool resources and its association with biological diversity and ecosystem services are decisive factors in resource valuation. Consequently, such valuation would affect the employment of policy instruments aimed at reducing, if not eliminating, externalities.

This approach conforms to emerging economic perspective that puts stress on comprehensive outcomes, which is the entire result of a process and would include natural resource depletion, pollution, and any side effects of the production, distribution and consumption processes. This is contrasted with culminative outcomes which are limited to the obvious result visible to the buyer at the moment and point of purchase, and the profit made thereby by the supplier (Hawken et al 1999).

However, it is expected that valuation schemes to incorporate social and environmental costs in the value chain will remain contentious unless there is increasing adoption of an array of appropriate policy instruments which would facilitate the development of widely-accepted standards.

On the demand side, various social and environmental certification schemes such as ecolabelling abound which attempt to promote sustainable fisheries and provide financial incentives for producers who adopt socially and environmentally responsible practices. Ecolabelling schemes can be seen as opportunities and possible tools for developing countries to increase value added to their fish and fishery products and improve access to international markets especially for processed products (FAO 2004). Potentially, because of the selective and passive nature of fishing technology employed by small-scale fishers, they possess an inherent advantage when the market gives a premium for sustainable produced fish.

Apart from these voluntary schemes, there is growing influence on fisheries to comply with systems to ensure food safety and quality such as Hazard Analysis and Critical Control Points (HACCP) programs. This underscores the need to develop postharvest infrastructure that will mitigate perishability of fishery products such as the establishment of cold chains which, if accessible to small-scale fishers, could help increase their market leverage (FAO 2004).

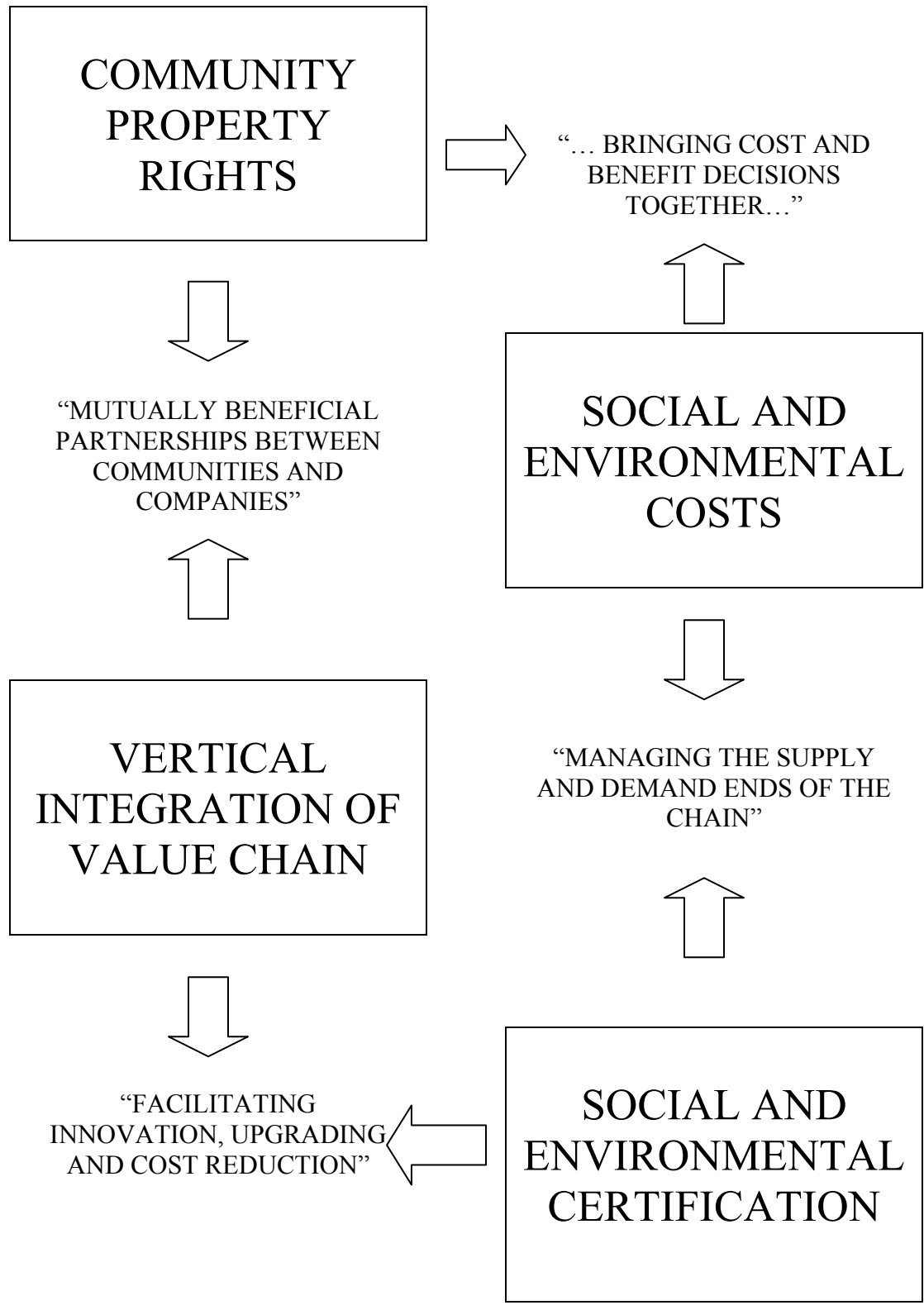
Community Property Rights as Guidepost

For small-scale fishers to manage resources sustainably and at the same time enhance their household income, community property rights is posited as a necessary condition. Thus, it can be viewed as a central guiding principle in implementing community-based coastal resources management that will internalize social and environmental costs. Such internalization could have significant implications on relational dynamics and distributional outcomes in the fisheries value chain e.g. if previously “underpriced” fishery products become more expensive as a result of the success of community property rights regimes, how would this affect the position of traders, processors and exporters?

There are some who hold the view that redistributing benefits and cutting out links through the value chain for the benefit of small-scale does not seem, prospectively, to have a high chance of success (Macfadyen et al 2003). This seems to be just honest recognition of the imperviousness to change of current configurations of political and economic power in fishing communities and the fisheries sector as a whole.

In contrast, a more positive perspective is that for small-scale fishers to cope with and even gain from globalization is for them to adopt sustainable fisheries practices on their own terms and at their own pace and link with progressive consumer movements to foster more direct trade between small producer organizations in the developing countries and consumer-based institutions in the developed countries (Kurien 1998). This approach could incorporate social and environmental certification schemes spearheaded by consumers and which can eventually institutionalized with governments and the business sector.

Figure 4. Elements of Value Chain Analysis in Small-Scale Fisheries



From the latter view, a possible guidepost for small-scale fishers and their advocates would be for community property rights regimes incorporating social and environmental costs in fisheries production to pursue value chain integration and demand-side initiatives such as ecolabelling only if such pursuit would clearly result to beneficial social, political and economic outcomes for the community. If not, then it would be better for small-scale fishing communities to delink themselves from a system that would bring them no good and could even lead to their eventual demise as a socioeconomic sector.

Some Reflections on Fisheries Value Chains

With the elements of value chain analysis in small scale fisheries graphically presented in Figure 4, an initial set of questions specific to each commodity discussed can be formulated upon which a more comprehensive research design can be designed. Some reflections on the production and marketing of these commodities may help in formulating research questions.

Tuna fisheries in the Philippines, especially in larger species for export, are being increasingly characterized by commercial production. Even with medium scale operations such as handliners claiming that they are not commercial fishers, the value chain of small scale fishers appears to be truncated i.e. most of the smaller tuna and tuna like species are mainly for the domestic market. Such a situation implies division between commercial fishers (who catch for export) and small scale fishers (who catch for local consumption). Coupled with the fact that the Philippines both exports (high grade) and imports (low grade) tuna, there may be an opportunity for linking local production from communities to processors who produce both for the local and export markets.

There may be formidable obstacles to achieving this such as the fragmented nature of the small scale fisheries sector, lack of postharvest facilities for proper handling of fishery products, long supply lines and the potential threat to local food security by redirecting production away from local food needs of the community. But initiatives to establish these linkages could adopt approaches such as subcontracting for on site processing and setting production quotas with consideration for local demand to overcome these obstacles. This could go in hand with local community property rights regimes.

With regard to offshore commercial operations, the expected dynamic between (community) property rights and internalization of social and environmental costs may take on a different dimension given the fundamental difference between artisanal and offshore fishing operations.

Reducing, if not entirely eliminating, social and environmental costs associated with intensive aquaculture emerges as the highest priority with regard to shrimp. Various codes of conduct have already been developed and need to be implemented to determine their efficacy in practice. Policy instruments such as environmental taxes, bonds and tariffs can also be applied to mitigate externalities and revenues from such can be allocated to the relevant communities as compensation. On the demand side, social and environmental certification schemes can also be brought to bear on unsustainable and inequitable shrimp farming practices.

In the Philippines, property rights arrangements are characterized by private or de facto private tenure. This makes it difficult to work towards community property rights in shrimp aquaculture short of radical political change. However, some openings can still be maximized such continued work preferential transfer of government-leased ponds, which makes up almost half of the total, upon expiration of the lease to small scale fishers cooperatives.

As much of the farmed shrimp value chain is already integrated and there are almost insurmountable barriers to entry, it is expected that government regulation, either directly through social and environmental policy instruments or through market incentives, will play a crucial role in not letting communities and society as a whole bear the cost of externalities.

Seaweed production is said be already vertically integrated despite primary production decentralized among many small producers. However, a cursory look at the initial value chain for seaweeds reveals that a very small percentage of the intermediate price (free on board), much less the final price, goes to the producer.

Governance and distributional outcomes in the value chain would improve if the small producers are able to band themselves into association who can negotiate collectively with traders,

processors and exporters for better prices and, if conditions are favorable, forge mutually beneficial production contracts with these firms.

An imperative for seaweed farming is stringent protection of nearshore waters to ensure the ambient conditions for continued productivity. A community property rights regime would be one way of ensuring that the fishers have the means to carry this out.

Apart from these top three fishery export commodities, value chain analysis can also be applied to species that are primarily produced for the domestic market such as small pelagics (e.g. sardine and mackerel) and farmed freshwater fish (e.g. milkfish and tilapia) not only to define the present characteristics of these chains but also to anticipate their potential for international trade and concomitant implications of such on small scale fishers and coastal communities.

From initial estimates, prices in specific links of the value chain needs to be determined with precision. To achieve this, information can be mined from diverse sources such as often inaccessible government databases, industry associations, who are expected to possess timely and accurate information upon which they base their business decisions, and academic and research institutions. Another gap that needs to be addressed is price formation in the links of fisheries value chain located in importing countries.

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