

An underwater photograph showing a dense field of green seaweed. Several pieces of white plastic waste, including a bottle cap and a small container, are visible floating in the water among the seaweed. The water is clear and blue.

What I Heard:

## The Nature of Seaweed Farming in Caluya Islands, Antique, Philippines

By Shannon Arnold

Between May and September of 2007, I undertook research for my Masters degree in the Caluya Islands, Antique province, Philippines. The purpose of the research was to examine the changes that the people and ecosystem of Caluya have experienced with the introduction and growth of seaweed farming as their main livelihood. The research also contrasted the outcomes of seaweed farming to proposed development of tourism in the municipality asking whether all forms of market integration are equally beneficial for rural economies. My research was part of a larger project multi-university project looking at experiences of communities throughout South East Asia as they transition from mainly rural subsistence fishing and farming to being part of global market systems.

This report is intended for participants of the research. It reflects back what I heard from the community participants, presents background info, and briefly summarizes my analysis and conclusions for use by the community.

## Acknowledgments

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All images in the report taken by Shannon Arnold.

This report is intended as a brief summary. The full data, analysis, conclusions can be found in my thesis:

**'Seaweed, Power, and Markets: A Political Ecology of the Caluya Islands, Philippines.'**

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## Research Goal

The purpose of the research was to examine the changes that the people and ecosystem of Caluya had experienced with the introduction and growth of seaweed farming as the main livelihood. My research looked at how the previously subsistence based community integrated a market based cash crop into their livelihoods choices. The research also contrasted the outcomes of seaweed farming to proposed development of tourism in the municipality asking whether all forms of market integration are equally beneficial for rural economies.

## Research Questions Included:

1. What is the outcome of seaweed farming in Caluya? Has it been beneficial or negative for the people? Why? What is the impact on the environment?
2. How do the natural properties of the area and of seaweed itself affect the outcome?
3. How do the political and social systems of the community affect the outcome?
4. Is market integration bringing more or less regulation, ecosystem degradation, social vulnerability, and external control over community resources?
5. While both tourism and seaweed farming link Caluya to global markets, how do the two processes differ and how does that affect the impacts on the community and environment?

## Methodology

Over the course of five months I stayed with families on Sibato and Sibolo Islands, Panagatan Cays, and Caluya Island learning about the day to day life on the islands and seaweed farming. My research methodology was ethnographic and qualitative, investigating people's lived experiences and perceptions.

Long form, qualitative interviews conducted with:

- 37 seaweed planters
- 6 seaweed 'stackers' and local buyers
- 2 Municipal Agriculture Officers
- 2 focus groups were held on Sibolo Island with seaweed farmers on the topic of possible tourism development for the island

Informal discussions with:

- The Mayor
- Municipal Planning Office staff
- Barangay Captains
- Employees of FilEstates land development company
- Employees of Department of Natural Resources, Department of Tourism, Bureau of Fisheries and Aquaculture regional branches

I also traveled to Cebu to learn about the processing sector of the seaweed industry. I visited three processing plants that source seaweed from Caluya and interviewed each of their managers.

Invaluable as well were my everyday observations, casual conversations, participation in community events, and working with people on their seaweed and land crops. Information was also gleaned from municipal data, interactive mapping, government reports and websites, newspapers and unpublished research at the University of the Philippines in the Visayas.

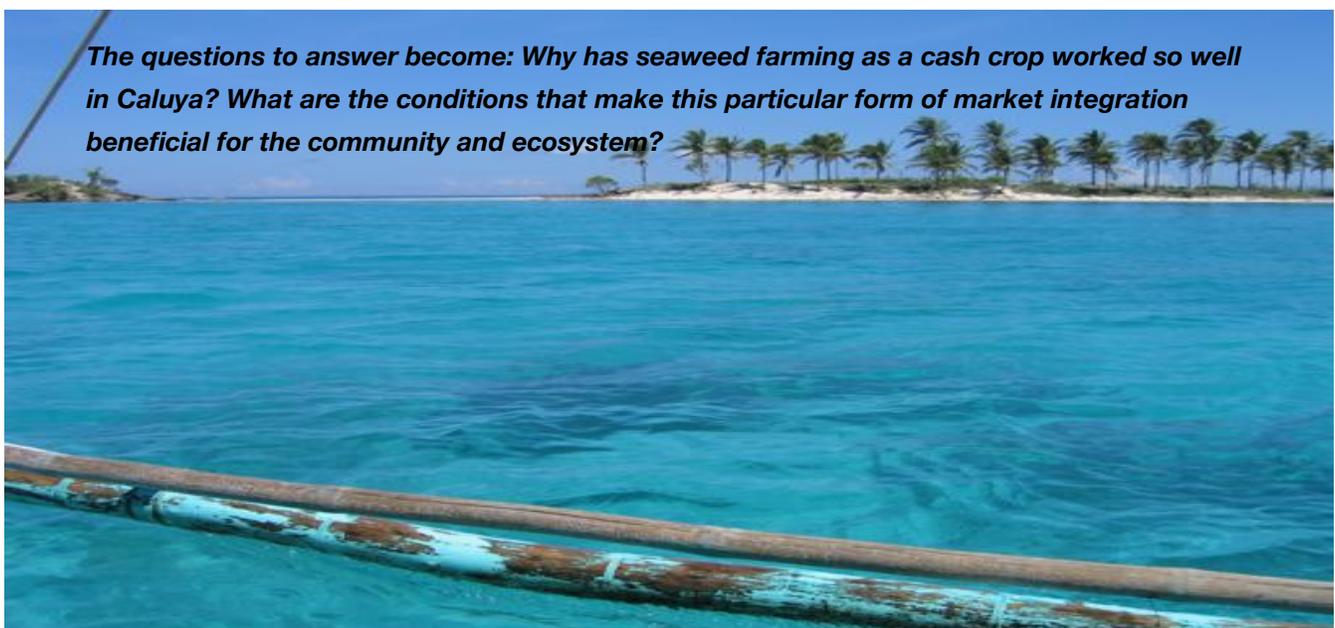
## Summary of Results

Less than 10 years after being introduced in the 1980s, seaweed farming became the main source of livelihood for the residents in the study areas (Sibato, Sibolo, Imba barangays, Panagatan Cays). This alternative livelihood has transformed the social and environmental situation in many ways. While hardship and inequity still exist in Caluya, results indicate that seaweed farming has been overwhelmingly beneficial here.

**Food security has increased, some coral areas are now being protected from illegal fishing practices, and opportunities for education and commodity ownership has increased. Moreover, instead of replacing traditional land farming and fishing, the addition of seaweed farming has helped rejuvenate and maintain these important pieces of family livelihood strategy.**

This is a surprising result for a few reasons:

- First, the impact on communities who switch to farming cash crops for export such as bananas, coffee, or shrimp has been well documented. The outcome tends to be increased debts, low income, increased inequity, less food security and environmental pollution. Although seaweed farming is a cash crop as well, this has not been the case in Caluya. It has offered access to cash while allowing people to maintain control over their time and labour.
- Second, coastal communities in the Philippines are generally not thriving. The Philippines is regarded as one of the poorer countries in South East Asia, well behind Malaysia and Thailand in income per capita, and with larger income inequality than Indonesia. An estimated 37 percent of the population lives under the poverty line. Rural and coastal communities, where more than half the population lives, have been especially devastated in recent decades by degradation of marine resources from industrial development, mining, and destructive fishing practices. In Caluya, by combining seaweed farming with fishing and farming for food, the majority of seaweed planting families have incomes well above the regional average.
- Third, many other communities in the Philippines that rely on seaweed farming do not show all of the same benefits that is seen in Caluya.



My research concludes seaweed farming has been beneficial in Caluya for two main reasons:

1. The nature of seaweed itself makes it different than other cash crops

*“During typhoons even land farming is difficult because you might get nothing and it takes a long time [to recover], you can recover only the next year... [In seaweed] you can plant again right after the calamity... I’m doing land farming since I’m young in Negros, sugar cane and rice. Seaweed is better. It has no land preparation too; you don’t need to plow or weed it. No expenses in fertilizer and medicine.”*

*– seaweed farmer on Panagatan*



2. The strong non-market social structure in Caluya that includes wealth redistribution, labour sharing, and continued communal access to marine resources. The cash economy of seaweed is embedded in this social structure, supporting it rather than breaking it apart.



**It is the natural properties of seaweed itself and the existing socio-economic structure in Caluya that work together to bring benefits from this cash crop. The importance of how these work together cannot be overlooked when assessing the potential benefits to the community of new market opportunities.**

Alternative possible development futures of wage work in the tourism or mining industry would not benefit the community as broadly and equitably as seaweed farming has been able to. These alternatives could, in fact, end up breaking down the beneficial social structure of Caluya as well as potentially degrading and polluting the ecosystem, undoing years of stewardship and entrepreneurial work by the seaweed farming families of the municipality.

## Vulnerabilities and Threats to Seaweed Farming in Caluya

While seaweed has transformed the lives of people in Caluya for the better, it is still vulnerable as a livelihood strategy. **Seaweed is very sensitive to environmental changes.** Pollution from coal mining run off has displaced most seaweed farms on the island of Semirara and at times affects seaweed growing on other islands. Warmer water and increased storms in recent years have also affected production bringing more disease and more difficult growing conditions. Increased climate instability in the future in this region would affect any industry reliant on the ocean including seaweed, fishing, and beach tourism.

Seaweed farming is also vulnerable to displacement in favour of other industries and investment. Seaweed farmers in other communities have found themselves on the losing end when big commercial interests want to develop the beachfront. **Lack of political power and organized representation for seaweed farmers is a major threat to the continued support of this sustainable livelihood by local governments.** At the time of

this study land speculation for high-end tourist development and/or mining expansion in Caluya threatens to displace seaweed farming. The lack of transparency around this is causing community divisions and wide spread fear for the future of their ocean-based livelihoods.

## Analysis - Not all market opportunities are created equal.

Some key conclusions can be drawn from Caluya's experience that help explain why certain shifts from subsistence to market work lead to marginalization and ecosystem degradation in rural communities while others do not.

There are certainly still inequities and vulnerabilities on the islands and seaweed farming has come with its own sets of power relations. The experience of seaweed farming has not been beneficial for everyone in Caluya. Nonetheless, the overwhelming consensus of residents is that seaweed cash-cropping has been transformational for them, offering access to cash as well as the ability to maintain control over their livelihood choices and land.

### **Is this just a unique and exceptional case or can there be larger lessons drawn from Caluya's struggles and experiences with market integration?**

In an effort to answer this and draw broader lessons, my research compared 1) the experiences of seaweed farming in Caluya with other seaweed farming communities, 2) other cash crops in Caluya and, 3) potential opportunities for wage work being offered by tourist development in Caluya.

Often government recommendations lump tourism, industrial opportunities, and seaweed farming together as equally attractive for coastal communities. The comparisons used in my research clearly show that not all market-based solutions offered to combat rural poverty are equally beneficial when investigated at the local level of people's experiences and perceptions.

For example, tourism development in Caluya, may benefit quality of life if measured only by income (in fact, the daily wage being offered by the tourism company is far below seaweed based income), but poverty statistics and wage levels do not tell the whole story. Equally important to people for their quality of life is having a degree of control over how they allocate their labour and time and the ecological well-being of community resources. While wage labour offered through tourism would also be a source of cash on the islands, it places control of time and labour choices in the hands of an outside employer and unless regulated stringently has been a major source of environmental degradation in neighbouring islands in the Philippines.

Seaweed brings a much need source of cash income to the community and it also allows time for families to fish and farm for food, to raise children together, and to pursue other business opportunities. The flexibility that seaweed as a crop offers has been essential in the ability of residents to integrate it into existing structures and create a hybrid economy, which supports, rather than marginalizes livelihood choices, diversification, and food security. Here the market integration of seaweed has served to increase the choices available for livelihood strategies rather than constrain them. And importantly, people have maintained a high degree of sovereignty over how and whether to use these new choices. It favours small holders and helps maintain community control over resource use rules and redistribution.

## Conclusions

My research concludes that having the following conditions in place is important to ensure that small, agrarian communities really benefit from integrating market opportunities:

- Individuals, families, and communities should maintain a substantial degree of sovereignty over choices about resource use and access - being the main decision makers in participatory, transparent planning processes and maintaining open access to common resources.
- Individuals and families should maintain or increase flexibility in the choice of how they allocate their time and labour. Small business ownership, like seaweed farming, offers this while wage labour typically does not.
- Activities of social reproduction like labour sharing, child care, food, and wealth distribution are aspects of all social economies and need time to be maintained by communities and should not be dictated by capital alone.
- Organic, locally spread knowledge of market opportunities may allow more people to participate and share ownership resulting in more broadly spread benefits than externally led projects or development plans introduced to the community.

## Recommendations

The experiences of seaweed farmers in communities around the world and analysis of future challenges in Caluya suggests some recommendations to consider:

- **Ensuring seaweed farmers have a voice**
  - Strong, democratic organization by seaweed farmers is essential in order to secure the future of their livelihood
  - Globally, research shows that the guarantee of a decent livelihood is the result of hard-fought struggles where different social groups with different interests confront each other and reach settlement. Without community empowerment, even the most stringent regulations on paper do not get implemented in reality.
  - Learning from parallel experiences in other communities and exchanging ideas and building networks strengthens an organizations understanding and capacity.
  - Having a shared vision of future development and community planning prepared before a crisis allows communities and organizations to be proactive.
  - A federation of seaweed associations from different barangays in Caluya will help seaweed farmers actively participate in decision making, ensure the municipal budget supports FARMC and enforcement patrols, and is committed to undertaking a Water and Land use plan as well as a Community Based Resource Management plan
  - An association of seaweed farmers is needed to work with the processing sector to advocate for the Philippines government to continue to support the sector, especially in the face of new competition from Indonesia and China

- **Long-term planning for equitable, sustainable development**

- There will be increasing pressure on Caluya's land and resources and, along with it, increased social conflict. It is essential to *develop a long-term sustainable development plan* for the municipality and *inclusive, transparent planning process*
- The strength of participatory planning and management is based upon genuine community involvement and consultation
- Freedom of information and accountability are the cornerstones of strong planning processes

- **Benefits of Co-operative Associations**

- Co-operative farming associations offer farmers more marketing and buying power as well as options to raise capital for value-added businesses; community development projects; and science research opportunities
- Co-operatives can also ensure members follow good practice with planting, stewarding the marine environment, and post-harvest handling for quality through a 'conservation and management covenant'.

- **Planting and Stewardship**

- Cooperatively owned seaweed seedling nursery may be useful
- To ensure quality, post-harvest drying could be improved – raised platforms off the sand and covered areas
- Ensure planters do not damage coral while planting
- End all destructive fishing practices in Caluya such as dynamite, cyanide use, and coral breaking
- Improve waste management – reduce garbage, ensure garbage does not go into the ocean, ensure sewage and waste water is not running off into the shore area





## Section 1: Seaweed Industry – production statistics and market context

### Carrageenan global context

Seaweed farmers in Caluya are primary producers in a global commodity chain worth \$10 billion US. They grow green, brown and red types of *Eucheuma cottonii* (*Kappaphycus*) and *Eucheuma spinosum* (*E. denticulatum*) seaweed to supply the carrageenan industry.

Carrageenan is a gelling agent that is used as an emulsifier, a binder, or for suspension and stabilization in a range of products. It is added to products either by itself or after being blended with other additives such as bean gums, sugars or calcium carbonate depending on what the product calls for. In 2009, 50 000 tonnes of carrageenan was produced worldwide - the vast majority by the Philippines processing industry. Estimates put global demand at around 62 000 tonnes meaning that there is an undersupply in the market. There is a significant need to expand seaweed farming to produce more raw material for carrageenan processing.



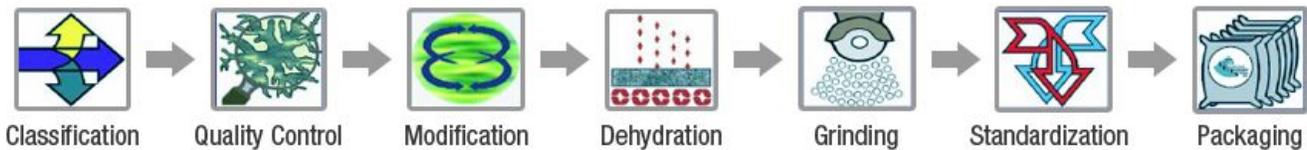
**Table 1:**  
**Carrageenan use by metric ton 2009**

Product category	Volume in tonnes
Processed meat	18 500
Dairy – chocolate milk, ice cream	14 000
Gel desserts	8 500
Pet food	5 000
Toothpaste	2 000
Other – personal care, pharmaceutical, beer production	2000
<b>Total</b>	<b>50 000</b>

Source: Bixler and Porse, 2010

The processing of carrageenan is a fairly simple process of grinding and washing the dried seaweed until a fine powder is extracted. In Philippines Grade Carrageenan no chemicals are used, therefore the waste water and 'sludge' from processing can be used to make organic fertilizers and other value-added products.

## Carrageenan Processing

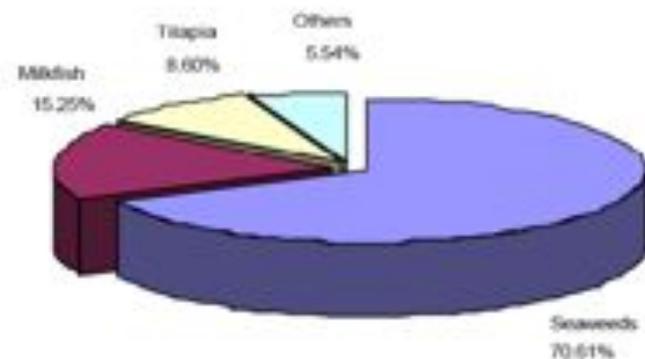


source: [www.mcpicarrageenan.com](http://www.mcpicarrageenan.com)

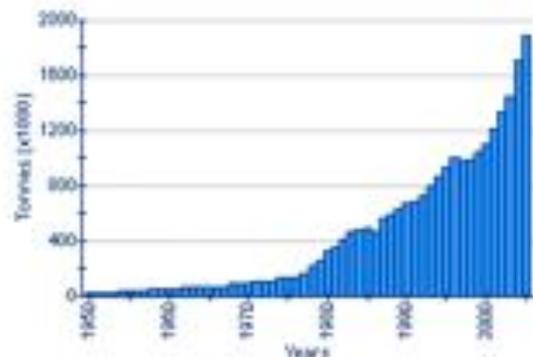
## National Production

The Philippines is the world's number one producer of carrageenan for the market with a very strong domestic processing sector. Until recently, the Philippines was also the number one grower of Eucheuma seaweed to supply the carrageenan processing needs. In 2007 the Philippines generated 72% of the world's supply with approximately 58 000 hectares in cultivation producing 1.3 million tonnes of wet seaweed (SIAP). However, the dominance of the Philippines has been upset since 2008 with Indonesia's farmers now taking over the top producing spot while the Philippines production declined. This shift is affecting the security of everyone involved in the Philippines industry - processors, traders, buyers, and farmers – who are now looking to the government to renew their support of the domestic industry.

Seaweed is an extremely important industry in the Philippines. It accounts for 70% of all aquaculture production in the country. There are an estimated 200 000 families of seaweed farmers running their own small businesses in the country. There are 22 processors and exporters. Refined and Semi- Refined Carrageenan exports were valued at \$128 million USD in 2003. Seaweed production has been the main driver of growth in Philippines aquaculture over the last three decades.



**Figure 1. Per cent share of aquaculture volume by species 2005. Source, Bureau of Agriculture**

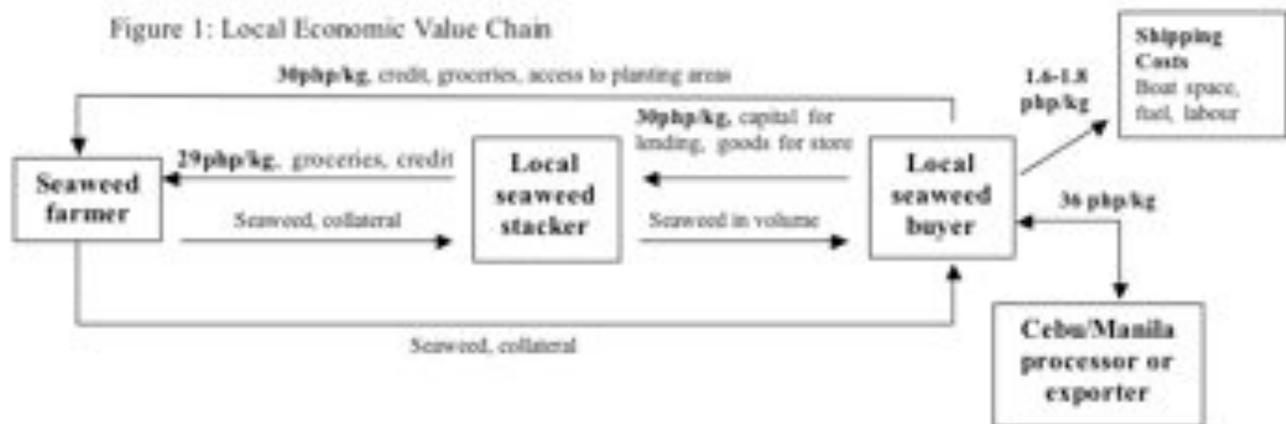


**Figure 2. Reported Aquaculture Production by Volume in the Philippines. Source: FAO 2002**

## Caluya, Antique Production



Located in the Western Visayas region, Caluya is a municipality of seven islands with approximately 20 000 residents. At the time of the study, Caluya was classified as a 4th class municipality. Previous to seaweed farming livelihoods here were mainly subsistence fishing and farming. **Now, Caluya produces an estimated 11 000 tonnes of dried seaweed annually with at least 25 00 full time planters and hundreds more part time planters.** Seaweed farming is the number one industry in the municipality employing approximately 30% of the work force. This makes Caluya one of the most substantial producers in the Western Visayas region (55 000 t), which is itself the fifth largest producing region after the ARMM, Zamboanga, Region IV B, and Central Visayas. The seaweed farmed in Caluya is sold dried to three main processors in Cebu and Manila – Shemberg Corp, Kerry Foods, and MCPI.



While seaweed offers many advantages for producers over other cash crops such as bananas, coffee, copra, or shrimp, seaweed farmers are still a link in an international commodity chain and are the most vulnerable and least able to absorb fluctuations in that chain. While those higher up the commodity chain are focused on

increasing their profit margin, seaweed farmers are dependant on the crop for their daily survival. Farmers are at a disadvantage in Caluya due to:

- A lack of market knowledge for negotiation. Only the local buyers know the market price for seaweed in Cebu, Manila and internationally
- No collective power to buy in bulk or market their seaweed more effectively
- A small financial buffer against price fluctuations in market or crop loss. This restricts their ability to take risks and invest in new business opportunities or create savings.
- Lack of security over future development of their lands and resources. This leads to risk aversion for business expansion and a lack of trust in the political process.

## International competition and changes in the seaweed industry

The most significant change in the seaweed and carrageenan industry in the past decade has been the recent shift in production dominance from the Philippines to Indonesia. The Philippines has dominated the farming of *Eucheuma* seaweed since the 1970s when the first experimental farms were started. With strong government support and research innovation throughout the 1980s, the Philippines developed the only domestic processing industry outside Europe and North America. Filipino processors developed a type of carrageenan called Semi-Refined Carrageenan (SRC) or Natural Grade Carrageenan (NGC) that was cheaper to produce and suitable for many food and products that did not need the highly refined carrageenan used by the pharmaceutical industry. This meant that farmers in the Philippines had access to local processors invested in supporting the development of the small-scale producers to supply a growing market. The SRC soon came to dominate the global carrageenan market accounting as a cost effective alternative for processed food production. Despite the steady growth of seaweed production there has consistently been an undersupply in the market and high demand for SRC. The price for dried seaweed given to farmers slowly and steadily increased throughout the nineties and early 2000s.

The seaweed industry is vulnerable to fluctuations in the price of energy and processing inputs, but **the constant struggle for processors is the availability, quality, and cost of seaweed being farmed.** Nowhere has the unpredictability of this been more acutely felt than in the Philippines over the last decade. In the mid-2000s the seaweed producing landscape started to change. While the overall amount of seaweed produced for carrageenan has remained around 140 000 dry tonnes *who is farming that seaweed* has changed. The Philippines hit a peak of production in 2004 and has steadily declined since then. This production gap was filled by Indonesia whose farmers have been steadily increasing production over the same time period. It is now Indonesia that is the top producer in the world.

Indonesia however does not have a well-established processing sector yet so currently it exports its seaweed mostly to the Philippines where domestic processors now need a source of seaweed to make up for the lack of local production. Indonesian seaweed is cheaper at the farmgate than Filipino raised seaweed. **While the Philippines government has decreased support to the industry over the years, the government of Indonesia is investing heavily in seaweed.** In order to build a domestic carrageenan processing industry, the government of Indonesia has announced plans to stop the export of raw seaweed in 2012. This would leave

Filipino processors with a major shortfall in supply leaving them open to competition from emerging processors and the potential loss of their main customers who can substitute other more available binding agents in their food products.

**The entrance of China into the carrageenan industry has also caused major shockwaves in recent years.**

In 2008 – 2009 prices of seaweed soared from an average of 30 pesos/kg in years before to 90-100 pesos//kg. This price war was set off by a sudden emergence of Chinese processing enterprises that aggressively pursued any raw seaweed they could buy. Filipino processors were forced to buy at high prices to ensure a continued supply from farmers. Subsequent years have seen the market rationalize somewhat again with prices dropping back down to 30-35 pesos/kg while the Chinese processing sector is reshaping. Cheaper carrageenan coming from China is a new threat to Filipino processors and the global industry is waiting to see what China will do next.

The Filipino processing sector is now looking to the government to renew its support for this sustainable aquaculture product and ensure that the Philippines does not lose its dominant place in the industry. **The Seaweed Industry Association of the Philippines (SIAP) has blamed the declining Philippine seaweed output on the lack of credit facilities for the farmers, shortage of high-yielding seaweed seedling banks, lack of post-harvest and farm-to-market facilities, and warm waters.** They are investing in supporting production at the farm level and working on solutions to increase production back to 2004 levels.

## Section 2: The importance of seaweed to Caluya’s standard of living and economy

Seaweed farming has raised the level of income in Caluya municipality well above the average income for the Western Visayas region and has injected much needed cash into the economy of the islands. **At least 30% of the adult population is engaged in seaweed planting full time with many more part-time.** On Sibato, Sibolo, Panagatan Cays, and coastal barangays like Imba almost 100% of the residents derive their main cash income from seaweed. **Caluya seaweed farmers bring approximately 400 million Php in seaweed sales to the municipal economy.**

**The access to cash has brought many benefits to individual families, but equally important has been the overall benefit to Caluya’s economy and standard of living that this cash injection has brought.** The municipality has not provided many of the basic necessities to the community. In some cases, the gaps have been filled instead by families who have become wealthier through seaweed and through a collective pooling of cash and labour resources by the community. The deep wells on Sibato and Sibolo were dug by local families who give access to the community for free. The schools were built through a community effort. The electricity available on the islands is from personally owned generators that nearby houses can hook up to for a monthly fee. Moreover, many local, spin off businesses in commodities, other good for traders, and service provision have spun off from the seaweed economy.

The table below shows the size of farms planted by the research participants. This is fairly reflective of the general distribution of farm sizes throughout Caluya. The majority of farmers have around 100 hundred lines, which is about 1/4 hectare:

**Table 2. Number of lines per research interviewee**

Number of lines	Number of planters (%)
10 – 50	8 (22)
50-150	15 (41)
151-250	6 (16)
251-350	1 (2)
351 or more	6 (16)

*Source: interviews with 36 planters*

## Individual & Family Benefits

As a crop seaweed has a very short grow out time to harvest and a low cost barrier for starting in the business. An initial investment can be paid off and expanded on in the first six months. Many research respondents had started with a small investment or loan of only 2000 Php for 10 lines worth of materials and seedlings. These 10 lines can be nurtured into a 100 line farm in 6 months and the harvest would be worth 15 000 Php. A common measure of mobility in the community is the length of time it take to upgrade to a boat with a motor. Previous to seaweed farming this could take 5-6 years of saving with seaweed income that time is reduced to 1-2 years only.

Many people saved a much larger sum before they invested in seaweed planting, either from other work they were doing, or perhaps from wedding gifts. Table 3 shows the costs of materials based on an investment for 100 lines.

The approximate net annual income derived from a 100 line (or ¼ hectare) seaweed farm is 120 000 pesos. The average income in the Western Visayas region is 95 000 pesos. In Caluya, much of a family's food consumption comes primarily from their own land crops and fishing, so 120 000 Php income would be more than sufficient to meet their basic needs.

**Table 3. 100 line seaweed farm investment**

Item	Number	Unit Cost (Php)	Lifespan	Total (Php)
<b>Just the Basics</b>				
Wooden stakes	200	1.50 each	1 yr	300
Strawless	13 rounds	80.00 per round	1yr	1040
Nylon lines	13 rounds	280.00 per round	10 yrs	3640
Seedlings	800 kg	7/kg		5600
Floats	5kg	100/kg	1 yr	500
Tarp (for drying)	2	50/m	10 yrs	1000
Total				12080
<b>Extras</b>				
Boat	1 no motor	6000	5yrs	6000
Bamboo(drying rack)	10 lengths	50	5yrs	500
Nets	2	70	10yrs	140
Tarp	2	50/m	10 yrs	1000
				7640
<b>Total</b>				<b>19720</b>

*“We depend on tambalang for all our basic needs”*

*- Seaweed farmer on Sibato Island*

Families all reported a substantial increase in their income and standard of living after taking up seaweed farming. Appendix A shows a detailed household budget for a mock family of six living on Sibato Island with only 100 lines of seaweed. This example would be considered a very small farm for a large family, but shows that even the lowest strata of seaweed farming families are able to meet all their expenses.

The list below reflects the main benefits reported by research respondents:

- **Increased access to education**



- the ability to send children to school was the number one reported beneficial change by respondents. This was especially pronounced on Sibato and Sibolo Islands where there is only schooling available up to grade 6. The cost of boarding on Caluya or Semirara for high school was previously too expensive for most families.
- As an example, when Rodney, the elementary teacher on Sibolo, finished his own elementary there in 1994, he was the *only one* of his batch to attend high school. He now estimates that 80% of his students will go on to high school.
- Not only are more children finishing elementary and high school, but many families are now able to send their children to college. The first university graduate from Sibolo island finished in 2004.

- **Ability to upgrade housing material**



- The percentage of mixed material (concrete and nipa) houses has dramatically increased and there are now a handful of wholly concrete houses on Sibato and Sibolo. Aluminum roofs are also more common.

- **Family can stay together**

- Before seaweed the options for earning cash income in Caluya were few. This meant that families were often separated as one spouse went to other areas for work leaving one person to raise children. As well as adding stress to the household, the lack of labour power meant many families did not have time to tend their own food crops or fish for food.

- **Increased commodity ownership**

- The ability to spend money on commodities that are not necessities is one indicator of increased standard of living. There is now widespread cell phone ownership, radios, and some families have TVs connecting Caluya increasingly to the outside world.

- **Increased ability to travel off the islands for more people**

- Caluya is a difficult and expensive place to get to and from requiring money for the ferry and buses. More people are now able to travel to neighbouring islands for commodities and opportunities. This, plus the increased access to communications and media as well as education has also brought new ideas to Caluya, started to break down traditional power structures, and helped communities to connect to broader support networks
- **Ability to invest in other business ventures**
  - Some people have capitalized on their seaweed earnings to open small sari sari stores, increase their fishing fleets, plant copra, or invest in a relative's business.
- **Less stress**
  - Respondents repeatedly noted that they now experience less worry about the future, their children's well being, and money.



## Environmental Benefits

The wide spread introduction of seaweed has led to significant shifts away from destructive fishing practices in some areas of Caluya and reports of overall improved health of the marine resources. Fish catch for small-scale fishers has steadily declined throughout the Philippines over the last decades due to degradation of the marine environment and overfishing. In fact, 85% of all municipal waters in the Philippines are considered overfished with average fish catch for municipal fishers declining from 10kg/day to 2kg/day.<sup>1</sup>

The increasingly unreliable fish catch was reported by many in Caluya as the main reason people decided to try seaweed farming as an alternative. The coral areas around Caluya have sustained significant damage from dynamite and cyanide fishing as well there have been many injuries and deaths among residents from compression fishing. While there continues to be room for improvement in waste management, pollution control, fishing for endangered species, and damage to corals, the incentive to protect the growing seaweed has led to encouraging changes:

- 10 years ago there was a community decision to ban dynamite and cyanide fishing around Sibolo Island
- Significant reduction in dynamite use in all islands in study
- Municipal fishers and seaweed farmers patrol area to keep commercial and non-resident fishers out
- Reports of increase in juvenile fish in seaweed areas
- Reports of slight increase in near shore fish catch
- Increase in octopus who are attracted to seaweed for laying eggs
- Regrowth of coral previously damaged



*Octopus eggs in seaweed, Sibato Island*

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<sup>1</sup> La Vina, A. (2001). *Community-Based Approaches to Marine and Coastal Resource Management in the Philippines: A Policy Perspective*, Department of Environment and Natural Resources, Philippines.

Rivera, R. et al. (2002). *Aquatic Resources in the Philippines and the Extent of Poverty in the Sector*, Network of Aquaculture Centres in Asia-Pacific., Philippines.

## Section 3: Importance of seaweed's natural properties

*“During typhoons even land farming is difficult because you might get nothing and it takes a long time [to recover], you can recover only the next year... [In seaweed] you can plant again right after the calamity... I’m doing land farming since I’m young in Negros, sugar cane and rice. Seaweed is better. It has no land preparation too; you don’t need to plow or weed it. No expenses in fertilizer and medicine.”*

*– seaweed farmer on Panagatan*

The unique natural properties of seaweed create a number of key reasons that make it a beneficial, sustainable crop:

1. While seaweed grows better in the slightly cooler months, it can be grown in a continuous cycle, planted and harvested at any time during its growing cycle. This flexibility is an extremely important quality. It acts like a floating bank account.

*“It helps a lot because if you don’t have rice if you can harvest even one monoline only you would have rice...Even if it is extra it really helps.” - Seaweed farmer Sibato Island*

- This allows planters to plan their labour schedules according to how much time they want to spend on their seaweed, their land crops, and other activities depending on the rhythm of the seasons and social life
- Ideally, it is best to let seaweed grow for 1.5 -2 months in terms of quality for harvest but there is no particular time when it is “ripe” like other crops. Having seaweed growing really is like having a savings account; it is basically cash in hand. If there is an emergency, a planter can harvest seedlings only put in the water the day before. They can dry them and get cash right away. The ability to plan harvest times outside of a strict natural season, helps families plan financially for expensive activities like weddings. For example, many families plant a large batch of line at the end of March so they can harvest in volume in time for college tuition fees in June.

2. Seaweed has quick grown out period of only 1-2 months from seedling to full grown for harvest

*“It is easy, one month only you can harvest already while [land farming] takes long time. In a year there is only one or two cropping [while] in tambalang every month you can harvest.”*

- Loans and credit can be paid off quickly
- A seaweed planter can recover their crop quickly after storm or disease damage. While crops like copra take years to regrow if damaged, seaweed can be producing again within weeks.

3. It is extremely difficult to privatize or corporatize seaweed as a crop. Other cash crops often become plantations with farmers indebted to large agri-business corporations. Seaweed favours individual farmer-owners.

- Farmers do not have to buy seeds or fertilizer from companies. Seaweed is naturally occurring and is grown from cuttings of the larger plant, therefore it is difficult to 'own' seedlings like companies own other crop hybrid seeds. This eliminates the 'cycle of indebtedness' to 'the company' that is documented in other corporate owned crops.
- The inability to fully own seaweed seedlings also distributes benefits more widely in the community. Seaweed pieces that have broken off of lines can be collected and dried by poorer families, people who cannot plant, and children. Farms lost to calamity can be restarted with foraged seaweed pieces.
- Unlike other cash crops where quality and packing control can be stringent and extremely costly to planters, processing companies who buy seaweed assert very little control over planting and drying techniques.
- Caring for seaweed follows the patterns of tides and weather fluctuations and calls for only 3-4 hours of work per day. This makes it uneconomical to hire labourers for large plantations and favours flexible small-holder production.
- The low cost of entry and availability of seedlings makes this a more accessible livelihood option
- Seaweed is grown in the open ocean and areas are therefore extremely difficult to enclose or privatize completely. Thus, the seaweed planted area of Caluya are also openly accessed by residents for other marine resource collection, fishing, and recreation.

4. Seaweed is a robust crop



- Sold after it is dried, seaweed can be grown in remote areas that are unsuitable for perishable crops that need to get to market quickly
  - It can be stored dried for long periods while farmers and traders wait for supply to decrease and prices to increase
5. Seaweed is not highly labour intensive
    - Daily labour time needed depends on the growing cycle, but farmers have quite a bit of flexibility in terms of time allocated to seaweed. This leaves time for families to allocate to land farming, fishing, child care, other businesses, community celebrations, and individual, and family activities. This increases food security, community cohesion, and individual satisfaction.
  6. Land based labour of seaweed is communal activity
    - Social aspects of seaweed farming are part of quality of life. Labour sharing, being able to work together in a communal atmosphere tying and planting offers time to share knowledge and community planning.
  7. Seaweed is grown in the open ocean and does not take up land used for food crops.

## Caluya's Social Structure

**The socio-economic structure and tradition of common resource access rights in Caluya has been equally important in ensuring the wide spread benefit of seaweed farming here.** The success of seaweed as a capitalist set of economic activities – commodity production for the market, capital accumulation, and export led growth - is reliant on non-market, kin-based social reproduction activities. Without this 'diverse economy', seaweed farming has not prove to be so beneficial in other communities.

Appendix B is a table outlining some of these economic activities that take place outside the capitalist market and that are indispensable for redistributing wealth and decreasing inequity on the islands. Below are the key aspects of Caluya's social structure that supports more equitable benefit sharing.

1. The importance of Caluya's kin-based structure
  - The kin based social structure of Caluya has created a credit system guided by relational trust, which is not overly exploitative. Credit and loans are not just between planters and buyer, but also between family and friends. These zero-interest, risk-sharing strategies through loans and gifts allows families to better deal with income variation and economic shocks
  - Labour sharing between family members is also extremely important. The swapping of farm labour, buligay; sharing of areas, bulos-bulos; and sharing child care all contribute to the profitability of seaweed farming and the redistribution of wealth
  - Labour is also paid at a daily rate or per line of seedlings tied and these wage earning opportunities are often offered to relatives in need of more work first
  - Kin relations also mostly govern access to seaweed farming areas now with older family members, original planters, partitioning their large areas and gifting it to younger members.

## 2. Common property and resource access



- The seaweed planting areas in the ocean are a mix of privately owned lines and open access. This is extremely important for ensuring continued access to residents for marine resources for food and selling like octopus, shells, and fish
- The beach area is also communally owned with open access for parking boats, drying seaweed and fish, work huts for tying seaweed, and collecting washed up seaweed
- Seaweed is only considered owned by someone if it is attached to a line. Seaweed that has broken off and is floating or washed up on shore is considered open to anyone to collect. This is an important mechanism for ensuring that even the poorest residents or those unable to plant can still access this means of cash income
- Common access also extend to the land in some areas with traditional open access to fruit trees and gathering of root crops

## 3. Residents maintain an exit strategy

- Seaweed farming families in Caluya have access to at least some land for food crops as well as fishing equipment and, therefore have an established 'exit' strategy should seaweed planting become unviable. This is true here since most planters are established residents, unlike the situation in areas of Mindanao where many planters are refugees from conflict situations with no claim to land in their new area. Even on Panagatan, where most planters are not residents,



many still have land and assets on their home islands that they maintain through money made from seaweed. The planters and families in the most precarious situations in Caluya are generally those who are newcomers to their planting island and been forced to migrate because of economic hardship elsewhere.

- In the absence of national welfare provisions, the maintenance of even a tiny patch of family owned land is an essential safety net

#### 4. Gender and age equity



- In Caluya, there are no social constraints on who can own and labour on seaweed farms. Both women and men own seaweed lines individually and perform all aspects of labour; husbands and wives also can opt to own farms together. While child care of young children is more often done by women and therefore meshes better with the onshore labour of seaweed, this is not a strict pattern.

- Seaweed farmers are also owned by people of all ages. The oldest research respondent was a 79 year old women still planting, while the youngest planter interviewed was 13. The flexibility of labour needed for farming means that even enterprising children and teens can plant, collect, and dry seaweed before and after school.

#### 5. Caluya's tradition of food sharing

- Food sharing practices on the island also play an important redistributive role. It is common for families and neighbours to give food to each other to help with shortages, with the expectation of reciprocation in the future. More wealthy members of extended families are also expected to share their resources with poorer families and frequently do so.
- The time seaweed leaves available to people during the day is essential for maintaining this food sharing. Community activities usually involve food sharing and these events are important parts of poorer families' food strategies. Such events include birthday parties, wakes, weddings, and other family celebrations. These events, especially if hosted by a barangay official, are expected to provide food for anyone who attends, especially children and can happen once or twice each week. Larger community food sharing events include barangay and religious fiestas.

## Section 4: Difficulties and negative experiences reported

Like any livelihood and community seaweed farming in Caluya has negative aspects and difficulties that restrict people's mobility within the value chain

### 1. Access and conflict issues

- All suitable areas for planting have long been claimed in Caluya. This means that many new planters cannot access areas and planters who want to expand their area have difficulty doing so
- The lack of clearly defined seaweed areas can lead to conflict among users due to people encroaching on others' areas or taking over areas that are claimed but may be empty for the off season. There are also reports of seaweed lines or drying seaweed being stolen.
- While the practice is not yet wide spread the lack of available planting area may lead to more and more seaweed areas being sold on the market increasing the cost of entry and potentially leading to consolidation of areas by buyers who can afford to pay to accumulate area. This is already occurring on Panagatan and recently on Sibato
- Money management can be an issue for many planters, especially since there are no banks on the islands. On Panagatan this is more pronounced since there are more temporary planters there with a lot of cash floating around and time on their hands. Debt has led some people to use their seaweed area for credit, thus turning them into tenant farmers and consolidating some areas into the hands of a few buyers.
- There is tension and conflict between 'resident' planters and 'transient' planters on each island. This would only increase if people are displaced from their areas due to development or pollution and need to re-establish in another barangay. This has already been the case with those planters displaced from Semirara by coal mining activity

### 2. Risk in the international market

- The price of carrageenan at all levels of the value chain fluctuates with ups and downs in the global market. As experienced in recent years, new entrants into the market, competitions from lower labour costs in China, and subsidized production in Indonesia have created wild fluctuations in the price of seaweed in the Philippines
- Carrageenan can be substituted by other products as a food additive. Although, it has unique properties, there are a suite of products, like agar agar and various gums that food companies can substitute if the price of carrageenan is too high. Therefore, although there is an undersupply in the market, exporters and buyers are limited in how much they can increase the price before losing clients. This keeps the price at the farmgate low.
- From a processor perspective, it is not in their capital interest of to take on poverty alleviation of their suppliers. In recent years Filipino processing companies have sourced cheaper seaweed from Indonesia. Ensuring domestic buying and continued growth in farms can only be realized through government support

### 3. Kin-based relations as a negative

- The same social kin networks that support the well being of most people in Caluya, can also have negative consequences for others. Family politics and power struggles can constrain farmers' choices and ability to negotiate prices. Such tightly knit communities can also exclude outsiders and isolate marginalized members as well as place excessive claims on group members and restrictions on individual freedoms.
- Long standing conflicts between families affect people's freedom as well as their access to loans and credit.
- As mentioned, it is increasingly difficult to access areas to start a new farm. The kin-based structure makes it difficult for newcomers to enter the industry and access credit if they do not have solid family relations established.
- Widows or older females whose husbands have left and who do not have boat/swim skills, as well as planters with a small family support network are at a disadvantage since they must pay for labour more frequently and cannot take advantage of family labour swapping.
- While kin-based loan systems do not have interest, they often cannot absorb major financial shocks as well as institutional loans can. Two of the processing company managers I interviewed in Cebu felt that the lack of official safety net for planters was the main reason there has been an undersupply of seaweed in the Philippines recently. After major crop losses or community calamities it can be difficult for planters to access the amount of money needed to restart.

### 4. Established power structure and mistrust of officials

- Power remains concentrated in the original settler families of the islands, though there have been some shifts in that dynamic with families who have made money through seaweed coming to more prominence.
- Two families have dominated the mayor position over the last three decades and the municipal politics are difficult to break into for people outside the elite families.
- There are reports of vote buying as well as holding basic services such schools, electricity supply, and, permits 'hostage' in exchange for political favours
- The potential lack of transparency and democracy in decision making at the municipal and barangay level increase the instability of people's lives and decrease trust in the democratic process as a means for community betterment
- For example, efforts to map seaweed areas and establish a mechanism for more open, regulated access to seaweed areas have been supported by some farmers and may benefit young and new planters, but are also regarded with distrust. Past experience with officials taking advantage of their position and charging fees have stopped many for participating in this as a community activity.

## 5. Remoteness

- Caluya's remote location makes access to quality health care difficult as hospitals are a day's travel away. It is also difficult to access agricultural extension services and banks.
- The municipality is often even left off maps of the province and there are few data sets for the area. This statistical marginalization leads to it being overlooked as an important economic area or as an area for services.
- The invisibility of the area has made it easier for land speculation, bad land deals, and mining pollution to go unnoticed and unpunished outside the area

## 6. Disease

- A major source of crop loss for planters is through disease, especially 'ice-ice'. This disease is more common when waters are warm or when there is too much rain. It reduces the harvest, quality, and price of seaweed. There is no known treatment
- The return of juvenile fish to the area indicates better marine life, but it also is problematic for farmers since some fish eat the seaweed. It is also difficult to deal with sea turtles eating the seaweed at times.

## 7. Buyer difficulties

- Local buyers and traders in Caluya face their own difficulties. They must front large amounts of capital to get the seaweed to Cebu or Manila and are only reimbursed by the processors after the quality of seaweed is assured. If the seaweed is not dried properly or contains too much 'foreign matter' like sand and rocks, it is the buyer who must absorb the cost of a lower price since they have already paid the farmers.
- Buyers and stackers have also been burned in the past by farmers not repaying loans – another risk of the kin-based loan system with no institutional support. Now buyers do not give large loans and are more choosy about who they will give credit to.



*'Ice-ice disease'*

## Section 5: Threats to seaweed farming in Caluya

### Environmental changes

The ideal growing conditions for seaweed are found around Caluya. The crop is sensitive to changes in these conditions, especially to pollution in the water. Caluya has clean water, sandy or mostly seagrass substrate with coral barriers 100-200 meters offshore that ensure there is some wave action, but the seaweed areas are still protected from the roughest water. The water temperature and salinity are most ideal during the months of December to May when it is slightly cooler and dry.

- In the last two years, planters have reported a shorter 'good' season. The slightly warmer water and unpredictable storms have made it harder to keep the volume of production up. Some research respondents felt that this was just natural fluctuations that cycle through the ocean related, for instance, to El Nino events, others felt that it may be early signs of more climate change to come, still others wondered if the oceans nutrients were being 'used up' because of continuous planting without fallowing.
- Climate scientists have predicted that the area around Caluya will suffer increased storms and unpredictable weather in the coming decades. The imperative of creating a long term adaptation plan for the municipality is clear.
- Near shore pollution is a major concern for seaweed farming in Caluya. Residue from coal mining as well as displacement from the physical infrastructure of mining has already put hundreds of seaweed farming families out of work on Semirara Island. The coal residue at times is found coating seaweed as far away as Caluya Islands – a 1.5 hour boat ride from Semirara. Expanded coal mining would further threaten seaweed farms throughout the municipality.
- Onshore development on the beach front could also negatively affect the environmental conditions needed. In other communities, unchecked development increased municipal waste water and sewage run off leaving the intertidal zone polluted and not suitable for growing seaweed. In these cases increased boat traffic and improper anchor use also contributed to pollution and coral damage

## Tourism development – who has the right to control space in Caluya?

This



or this?



**Ironically, the very qualities that make Caluya ideal for seaweed cultivation – shallow, sandy beaches; clear, unpolluted waters, and a coral reef to break the waves – are also considered perfect for sun, sand, and sea tourism.** In fact, the characteristics overlap so neatly that the two markets are literally competing for the same stretches of beachfront. The remoteness of Caluya has enabled, what is proving to be a contentious community issue, to proceed out of view of the broader Philippines public.

The Caluya Islands are only a four hour boat trip from Boracay, “jewel of the Philippines” and pride of the tourism development sector. Now that Boracay has become over developed and crowded, it seems that Fil Estate, one of the largest investors in Boracay has set out to find an new ‘unspoiled’ destination for development. The company now has proposed a five-year development plan for Caluya municipality that includes hotels and resorts on Sibolo, Sibato Islands and Barangay Imba, Caluya Island; an airstrip and golf course on Caluya Island; and an airstrip on Sibolo Island. In 2006 they began working closely with the then mayor to secure land and change the municipal zoning laws. The company managed to buy large chunks of land on Sibolo Island and in 2006/7 was trying to secure beachfront land in Barangay Imba. The plans call for the removal of seaweed farms from their current areas in order to clear the beach and shallows for tourists. This would displace at least 500 households from their source of livelihood and have a ripple effect throughout the economy of the municipality.

The relocation area the company proposed reflects a lack knowledge about the island's geography, suitable seaweed areas, or the social context of the island. Areas not being planted currently do not have the correct environmental conditions. Other areas are already parceled out to farmers or are common areas used for boat traffic and collecting other marine resources. Any attempt to transplant hundreds of farmers into new areas would result in chaos within the careful balanced ownership and use rights that are already recognized. Other infrastructure planned, for ex landing strips, a golf course, and beach huts would affect people's land crop and coconut areas further reducing food security and income.

Residents' concerns centre on the potential loss of their seaweed livelihood, but go beyond that and include worries about changes in values and safety of their children. A few examples of concerns heard expressed by residents during interviews, conversations and focus groups are gathered below:

### Concerns voiced by residents about potential tourist development

- "Where will we be able to park our motor boat?". Fears of loss of access to common property areas, like the beach front
- We are business owners now. With the resort we will only be able to do jobs like massage, cleaning, and labour.
- Foreigners will bring bad habits to the islands that our children and husbands might follow like drugs, more gambling and videoke, prostitutes and girls to look at.
- "The children will copy the habits they see. There will be so many people here...drugs will come..."
- No local loan and credit system anymore if the seaweed is gone
- What will we do? Return to more fishing, but the area for fishing would be restricted because of the tourist development and the rocky area of the island is not a good fishing area. Also, fishing income is less sure than seaweed planting because you cannot fish during bad weather.
- People might start dynamite fishing again
- "When seaweed is gone, poverty will return"
- We won't have money to send our kids to school anymore
- People will have to go back to looking for work in Palawan and Mindoro
- The company will spray chemicals in the water to clear away algae, like they do on Boracay
- The company will bulldoze the area off the shore they own and kill any seaweed or corals there
- Small business may not be able to compete with big business owners who come to the island
- He [the local manager] said that they would give money to those who are affected. [I am worried] that it is for a year only; that is our yearly source of income.... What if you do not know how to handle another business?
- "If my son drinks during the nights...I have hypertension and the worries about it will make it worse."
- A feeling of helplessness: "You can't complain anymore. They said in the meeting that if you have problem you have to complain there and no more murmur about it after because there is a meeting already."
- "We can do nothing about it, because money runs the show. If the people unite they can stop it, but almost half of Sibolo is owned by the company."

Residents are not of one voice about the tourist development. A handful have sold their land and a few research participants believed it would be a new source of jobs and income. Some of the younger residents aged 16-18, who had worked seasonally on Boracay Island felt that tourism on Sibolo would bring opportunity. All of them worked as maids for hotels or in private houses and were paid 1500 pesos a month, but with the cost of rent and food were left with no extra money. Nonetheless, they enjoyed the excitement of the island and wanted to go back to work there in hopes of meeting a man to marry. Within families there are conflicting opinions. In some cases, decisions about shared family land have led to quarrels. Some members of the community argue that the long term life of the island will be threatened, while others look at the immediate gain they can receive from selling their land.

There has been a lack of consultation in Caluya about tourist development as well as a lack of transparency about land titling and municipal government involvement. The company has exploited this using a classic 'divide and conquer' strategy approaching those who may not have experienced a significant rise in their standard of living from seaweed planting with secret offers, sowing tension and gossip in communities.

**As mentioned earlier, the common property and open access to the foreshore in Caluya is crucial to the communities food security and income generation. The enclosure and privatization of the foreshore and ocean would have widespread negative effects that would not be offset by wage labour opportunities in tourism.**

It has been well documented in other communities that it is not the original residents who benefit from this type of tourist development - planned in a top-down process with external investors. Rather it is the land that is needed not the people's labour. Jobs are typically low-paying and menial for locals while external people with education and experience are brought in to fill higher level jobs. Currently seaweed farmers are small-business owners and the offer of wage work in tourism does not appeal for a number of reasons, but mainly because it would mean losing control over their own time and labour. **Seaweed farming has created a community of entrepreneurs with many future possibilities for expanding their businesses in a way that benefits the larger community not just a few investors.**

The opposition to tourism development is not a case of rural farmers simply rejecting capitalist investment in their space. Residents here have been quick to take up opportunities to farm market crops and exploit market economies. People have private property. Land titling exists here in different forms already and is mixed with open access commons. Rather it is a recognition by residents that not all market opportunities offer equal benefits. **This is a struggle about control over access to resources, control over the related choices of livelihood strategy, and who has the power to decide.**

## Coal mining



As mention earlier, Semirara Island is the location of one of the largest coal mines in South East Asia, run by Semirara Mining Company. In 1940, Caluya municipality was declared by federal proclamation a coal mining reserve. Semirara Mining Company started an open pit mining operation on Semirara Island, Caluya in the 1970s with a major increase of activity in the mid 1990s. Widespread environmental damage of Semirara Island has been well documented and there are ongoing labor disputes concerning the working conditions of the operation. With the expansion of the operation, much of Semirara's seaweed farming was ruined due to pollution in the water. Many seaweed farmers from Semirara have been forced to move to other communities in order to find planting areas causing more pressure and tension on the other islands. The pollution from the coal mine is also felt on other islands. When the currents are flowing from Seimrara coal dust can coat seaweed throughout Caluya causing disease and crop loss.

On May 13, 2008, the Department Of Environment granted the Company's request for a 15-year term extension of its Coal Operation Contract until July 14, 2027. On November 12, 2009, the contract was amended further, expanding its potential exploration area to include Caluya and Sibay islands covering an additional area of 3,095 and 4,096 hectares, respectively.

**Neither of these decisions included consultation with the affected communities. The municipality has not held public meetings to discussion the company's activities and has denied that there is any expansion of activity on Caluya.**

Knowing the damage to the land, mangroves, and ocean that has been caused by the mining operation on Semirara, residents in Caluya are justly troubled by the possibility that the municipality may be allowing the company to move on to a new island. According to documents released by the company when they went public, there is only seven more years of coal left in their current location. Therefore, the pressure on the municipality to allow expansion will continue to increase. The municipality also receives a large amount of its revenue from the mining company operation and has a vested stake in seeing continued operation.

## Appendix A - Example of Household Income Data

Detailed Household expenses - Family of four on Sibato with 100 seaweed lines

Item	Amount	Unit Cost (pesos)	Total in pesos
Rice	1.5 sacs	1180/sac*	1770
Fish/meat	Must buy ~ 12 kg per month	30/kg	360
Other groceries			750
Water delivery		10/container	200
Clothing		300	400
Fuel	Kerosene for lamps Motor gas 10ltr	20p kerosene/mth 45p/ltr	470
Electricity barangay generator			130
Transportation	3 trips to Caluya 16 trips-high school	80/trip 8/school trip	368
School Fees If in college			
School Living Allowance/boarding cost		100/child to board 100/pesos per child weekly allowance	1000
Taxes			
Seaweed materials and maintenance			avg 420
Other farm/fishing inputs			
Labour payments(or in kind)		8p/line tie x 20	160
Credit taken from stacker/buyer			~1000
Loans to others – for rice or collateral, family help etc			~500
Medicine			100
<b>Total Expenses**</b>			<b>7628</b>

\*\* Expenses that could be added to the basic table vary from family to family but a few more common items mentioned in interviews include children's college tuition and living expenses, hired labour for land crops, cell phone load, alcohol, videoke, church donation and boat repairs.

## Family Income

<b>Source</b>	<b>Amount high / low season</b>	<b>Unit Price</b>	<b>Total in pesos high / low season</b>
Seaweed harvested	275 kg / 130kg	30p/kg	8250 / 3900
Seaweed washout collected	120 kg/60 kg	30p/kg	3600/1800
Fishing For consumption		30p/kg	800 peso value on market
Farming For consumption			600 peso value on market
<b>Total Gross per month</b>			<b>13 250 high season + 7100 low season</b>
<b>Total Net Per month</b>			<b>5622 high season / -528 low season - (shortfall covered by credit)</b>
<b>Annual Income</b>			<b>122 100 pesos</b>

## Appendix B - Caluya's Diverse Economy

Transactions	Labour	Enterprise
<p><i>Alternative Market</i></p> <ul style="list-style-type: none"> <li>▪ 'suki' relations at sari sari store and seaweed buyers</li> <li>▪ sidewalk vending</li> <li>▪ seaweed paid for groceries</li> <li>▪ 'halili' system –seaweed farmers get credit, give capital and /or labour to rice farmers in Mindoro in exchange for rice</li> <li>▪ micro-credit lending</li> <li>▪ 'patinga' – advanced money for unborn animals</li> <li>▪ barter – fish, crops</li> </ul> <p><i>Non-market</i></p> <ul style="list-style-type: none"> <li>▪ food sharing</li> <li>▪ childcare sharing</li> <li>▪ animal and seaweed area caring sharing</li> <li>▪ care of household</li> <li>▪ school feeding program</li> <li>▪ gifts of money to newlyweds</li> <li>▪ 'gala' –sharing of fiesta expenses</li> <li>▪ donated labour and materials to build school</li> <li>▪ debt of gratitude</li> <li>▪ 'bulos bulos' – sharing of seaweed area from season to season</li> <li>▪ free water source built by one family</li> </ul>	<p><i>Alternative paid</i></p> <ul style="list-style-type: none"> <li>▪ self-employed – farmers, fishers, seaweed traders</li> <li>▪ 'buligay' – reciprocal labour sharing on farms</li> <li>▪ exchange of labour services</li> <li>▪ in kind payment – land farm help for part of harvest, seaweed labour for part of harvest</li> <li>▪ tenant seaweed farmers paid with a percentage of harvest</li> <li>▪ hired labour – 150 per day plus meals</li> </ul> <p><i>Unpaid</i></p> <ul style="list-style-type: none"> <li>▪ voluntary work to help baranagay</li> <li>▪ help with cooking and preparation for weddings, wakes, and fiestas</li> <li>▪ family labour on farms and business</li> </ul>	<p><i>Non-capitalist</i></p> <ul style="list-style-type: none"> <li>▪ schools</li> <li>▪ NGOs (in the past)</li> <li>▪ fishing enterprise</li> <li>▪ farms</li> <li>▪ small-scale producers – carpenters, chainsaw operators, cock breeding, videoke and pool table</li> <li>▪ tenant farms</li> </ul>

The 'transactions' column shows the way in which goods, finances, and services flow between actors and are reciprocated and redistributed. Many of these flows are ways that people in Caluya access cash, credit and assistance with financial burdens outside of formal institutions.

The 'labour' column includes work traditionally left out of economic valuation and demonstrates range of unpaid labour practices while the 'enterprise' column shows work that is not necessarily under capitalist relations of production.

What is clear is that the more capitalist market relations of seaweed are supported by “a thick mesh” of traditional practices, through which a network of bonding and bridging relationships creates complex interdependencies within and across kin groupings and neighborhoods. It is these practices, as evidenced in the food security discussion, that are indispensable for redistributing wealth and decreasing inequity on the islands.

