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## Smallholder Empowerment & Economic Growth Through Agribusiness & Association Development (SEEGAAD)

### Final Project Report

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*Prepared for:*  
USAID/TZ/Economic Growth Program SO9  
*Micro and Small Enterprise Participation in the Economy Increased*

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## **LIST OF ACRONYMS**

BDS	Business Development Services
CBO	Community Based Organization
COP	Chief of Party
CORDIO	Coral Reef Degradation in the Indian Ocean
CRC	Coastal Resource Center
CRDB	Cooperative Rural Development Bank
EG	Economic Growth
EGAT	Economic Growth, Agriculture and Trade
ENR	Environment and Natural Resources
GIS	Geographic Information System
ICM	Integrated Coastal Zone Management
ICT	Information and Communication Technology
IMS	Institute of Marine Science
IR	Intermediate Result
LOP	Life of Project
M&E	Monitoring and Evaluation
MKUKUTA	Swahili acronym for NSGRP
MSE	Micro and Small Enterprise
NGO	Non-Governmental Organization
NRM	Natural Resources Management
NSGRP	National Strategy for Growth and Reduction of Poverty in Tanzania
PSI	Private Sector International
SACCO	Savings and Credit Cooperative Organizations
SDSP	Seaweed Development Strategic Plan
SEEGAAD	Smallholder Empowerment and Economic Growth through Agribusiness and Association Development
SEMMA	Sustainable Environmental Management through Mariculture Activities
SO	Strategic Objective
TA	Technical Assistance
TCMP	Tanzania Coastal Management Partnership
TCZCDP	Tanga Coastal Zone Conservation and Development Program
URI	University of Rhode Island
URT	United Republic of Tanzania
WIOMSA	Western Indian Ocean Marine Science Association

## 1. EXECUTIVE SUMMARY

The Smallholder Empowerment and Economic Growth through Agribusiness and Association Development (SEEGAAD) project was designed in response to the need to compliment 10-years of coastal conservation activities in the Tanga Region with sustainable, environmentally sound economic development activities. The project began in November 2002 and ended in December 2005.

The project successfully met its objectives of: increasing productivity and profitability of new and existing mariculture activities; improving the entrepreneurial spirit and business savvy of stakeholders; and facilitating the development and strengthening of producer associations. The five basic components of the project include:

- Business skills training;
- Extension support;
- Expanding market linkages;
- Developing associations; and
- Strengthening the enabling environment.

The mariculture industry is growing rapidly throughout Africa. The SEEGAAD project provided various stakeholders the opportunity to explore the vibrancy of market channels. The four SEEGAAD product groups were seaweed, mud crab, prawn and lobster. During its first two years, the project focused on the seaweed industry. A series of workshops were conducted involving all the major industry stakeholders produced the framework for development of the seaweed industry. The Mariculture Working Group, including two SEEGAAD staff members, developed the Seaweed Development Strategic Plan.<sup>1</sup> The Tanga branch of the Tanzania Salt Producers' Association had SEEGAAD investigate prawn farming in the salt pans during the rainy season when salt cannot be harvested. An ACDI/VOCA volunteer in partnership with a technical advisor on the TanPesca Prawn Hatchery Project in Tanzania analyzed the systems in Tanga and modified a salt pond to serve as a demonstration pond for prawn trials. Unfortunately, the Mafia Island prawn hatchery did not begin test operations until October 2005 and is expected to be fully operational in April/May 2006. The owners of TanPesca are interested in working with outgrowers and see the Tanga Salt Producers' as an ideal partner.

Business skills training: SEEGAAD conducted business training Prosperity Workshops, Business Skills Training I and II, and Seaweed Farming as a Business, in 20 villages. SEEGAAD held ten Prosperity Workshops in the three coastal districts training 147 men and 273 women. Basic Business Skills Training activity reached 347 women and 353 men in the three coastal districts, while Seaweed Farming as a Business trained 19 men and 226 women in Pemba Pwani, Mgao, Naumbu, Mkungu in the Mtwara Region.

Extension support: SEEGAAD extended support for the higher-value *cottonii* variety of seaweed farming: expanding production by assisting exporters to identify new production sites (seaweed farmers increased from 276 to over 2,300); promoting a more efficient

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<sup>1</sup> The Seaweed Development Strategic Plan was approved by the Minister of Natural Resources and Tourism in June 2005.

outgrower model (model farmers in each village now earn an additional \$80/month); overcoming biological and environmental constraints; and improving farm management. SEEGAAD also supported mud crab commercialization with industry technical assistance, cage demonstration trials, and a mud crab value chain analysis. A SEEGAAD lobster casita trial in Kigombe village stimulated the lobster fishing industry, while *penaeid* shrimp farming was supported with value chain analysis, and industry linkages.

Expanding market linkages: Private sector partnerships played an important role in SEEGAAD expanding market linkages:

- The Tanga-based seafood exporting company, Sea Products, Ltd., has been a strong supporter of mud crab trade. By the end of SEEGAAD, 66 people were working on mud crab cage culture trials and crabs were being sold for \$2/kilo.
- Lobster is a high-value commodity with a beach price of \$10/each. Sea Products, Ltd. and the lobster divers in Kigombe village designed a lobster shelter to bring the adult lobster closer to shore using cement *casitas*. 20 *casitas* were placed in four groups and Kigombe lobster divers harvest 124 kgs. of lobster in November 2005 which sold for \$1,000. The trial encouraged exporters to put in similar structures in other areas.

Association development: The association development component focused on establishing mariculture associations in coastal villages. Association development training activities included sensitization, development of constitutions, leadership training and planning. Leadership training was the catalyst for leaders and members to take real “ownership” of the association. SEEGAAD helped establish nine village-level Mariculture Producers Associations with 492 voluntary members.

Enabling environment: SEEGAAD worked to enable Tanga villagers to fully participate in Tanzania’s free market economy, with programs that emphasized public-private partnerships, advocacy by producer associations, and coaching of government resources into appropriate roles. The project guided private sector firms and associations into dialogues with government at the national, regional and district levels to enhance the business-orientation of mariculture development. The Division of Fisheries is now more aware than ever that the increasing competitiveness of Tanzanian products is a priority and that their mission is to create the enabling environment supporting the entire industry.

Key accomplishments of the SEEGAAD Project include

- Facilitated the formation of 9 democratically-managed producer associations with 492 members;
- Increased the number of active coastal mariculture producers from 276 to 2,321;
- Trained 1,897 farmers in business and technical skills in 20 villages;
- Introduced mud crab cage trials in 8 villages involving 66 participants;
- Conducted lobster *casita* trial in Kigombe, where lobster divers harvested 124 kgs of lobster during four days in November and sold them at \$8US/kilo; and
- Improved the performance and commercial relevance of the Department of Fisheries.

## 2. INTRODUCTION

### 2.1 Project Background

The negative effect of poverty and population pressure has been largely evident in Tanzania's coastal regions, home to over 25 percent of Tanzania's population. The littoral and marine environment extending over its 1,200<sup>2</sup> km of coastline presents opportunities as well as challenges for resident communities. Artisanal fishing, aquaculture, crop production, livestock rearing, salt and lime making<sup>3</sup>, and harvesting coastal forests and mangroves all offer sources of income for these coastal communities but unsustainable uses threaten the very resource base that supports their livelihoods. Although there have been strong coastal conservation efforts during the last decade, poverty and a growing population have led to increased destruction of the coastal habitats and a proliferation of resource mining activities.

Since inception in November 2003 through the end of project in December 2005, the Smallholder Empowerment and Economic Growth through Association and Agribusiness Development (SEEGAAD) project played a key role in expanding economic opportunities for thousands of smallholders in the rural coastal regions of Tanzania. The SEEGAAD project was designed in response to many years of coastal conservation efforts that were only partly successful at protecting the coastal resources mainly because they failed to provide coastal communities with sufficient economic incentives for the sustainable use and preservation of their natural resources. Many coastal income generating activities have historically been highly subsidized with little or no incentives for the villagers to embrace a business-oriented approach to managing their various income generating activities. Through the SEEGAAD project ACDI/VOCA sought to introduce a new and innovative approach that was geared towards promoting income generating activities that would not only drive sustainable economic growth but would also enable smallholders to gain an active stake in protection of the natural resources.

The SEEGAAD project was funded by USAID Tanzania under the Economic Growth Strategic Objective (SO9) – “Increased Micro and Small Enterprise Participation in the Economy” and although the SEEGAAD project was initially designed as a two-year pilot activity ending in November 2004, and the project received a no-cost extension for an additional year to allow for the completion of the mariculture trial activities initiated during the initial two years. Early project activities focused mainly on supporting the seaweed industry but this was later expanded to include a range of other mariculture activities including mud crab cage culture, lobster casitas and prawn farming on salt farms. During the course of the project, activities were centered on the effective transfer of critical knowledge and skills to increase the profitability and ensure sustainability of mariculture enterprises<sup>4</sup>. SEEGAAD staff members worked closely with producers, traders, exporters and international buyers to address constraints and opportunities towards improving the performance of the various product lines. As a result, an innovative model that includes a series of business skills, association building and leadership trainings was successfully tested and proven in the

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<sup>2</sup> There are several estimates on the length of the coastline of Tanzania ranging from 800 to 2,300 km depending on the definition of ‘coastline.’

<sup>3</sup> Making lime from coral is prohibited by law in Tanzania.

<sup>4</sup> The term “mariculture” is hereby used to describe a range of marine based economic activities that may not necessary involve culturing. These include wild harvest of marine food products such as lobster and prawns.

Tanga region and this model can and is<sup>5</sup> already being replicated and adopted for use within other coastal regions of Tanzania.

The following report outlines the scope of activities and goals accomplished over the three-year period when the SEEGAAD project was implemented. The report also discusses the project results and lessons learned as part of the implementation process in light of the project objectives.

## 2.2. Performance Goal and Methodology

The conceptual platform of the SEEGAAD project was built upon the premise that increased economic wellbeing requires a community to continuously invest in protection of the very resource base that sustains its existence. As a result, the project aimed to not only increase incomes for smallholders and hence reduce poverty but to also empower them to become stewards in the protection of their natural resource base. The primary goal of the SEEGAAD project is summarized as follows:

***“To promote activities that drive sustainable economic growth, increase cash incomes and stimulate asset accumulations among households throughout the coastal region of Tanzania.”***

This goal was set to be achieved through four principal objectives:

1. Increase the productivity and profitability of existing and new community business activities in an environmentally sustainable manner;
2. Expand stakeholder knowledge of, access to, and control of key livelihood production and market systems;
3. Improve the economic well-being, business activities, and entrepreneurial spirit of the coastal communities; and
4. Build the capacity of local associations, CBOs<sup>6</sup>, and rural residents to form and manage democratic and economically strong rural agribusinesses.

SEEGAAD’s approach was geared towards identifying and supporting sustainable forms of income generating activities that would involve large number of MSEs within the coastal regions of Tanzania and result in increased economic efficiency thus increasing returns from these to the coastal communities. By enabling smallholders to have a better understanding and control of production, transport and marketing for their activities, the SEEGAAD project directly addressed the gap between the extensive coastal conservation activities and improving livelihoods for the poor coastal communities. The results achieved by the SEEGAAD project contributed directly to USAID Tanzania’s SO9 - “Increased Micro and Small Enterprise Participation in the Economy” by expanding economic opportunities for smallholders and enabling them to increase their incomes. Further, the project contributed to each of the three intermediate results (IRs) under SO9 namely:

IR. 1: Improved micro and small enterprise policy environment

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<sup>5</sup> The mariculture industry development model developed under the SEEGAAD project is currently being expanded under the Sustainable Environmental Management through Mariculture Activities (SEMMA) project also implemented by ACDI/VOCA.

<sup>6</sup> Community Based Organizations

- IR. 2: Broadened micro and small enterprise access to markets
- IR. 3: Strengthened capacity of small and micro enterprises

A more detailed explanation on how project activities contributed towards the above objectives is provided in later sections of this report.

### **2.2.1. Geographic Focus:**

The SEEGAAD project was initially designed to support income generation activities for smallholders all along the Tanzania coastline with activities set to start in the Tanga region in the northern coast and moving on towards the Mtwara region in the south coast. However, due to available limited resources, it was realized that an appropriate strategy would be to focus interventions in the Tanga region with the aim of developing a workable model that

Figure 1: Map of Coastal Regions in Tanzania



would then be scaled up to cover other regions overtime. The Tanga region proved to be an excellent focus region for the pilot activities due to the existence of on-going conservation support activities spearheaded by the Tanga Coastal Zone Development Project (TCZDP) which created a platform for an effective collaboration in applying a dual edged approach combining income generation and conservation to improve the lives of rural smallholders. In addition, the willingness of the local authorities and their communities to participate and support the proposed model was critical in ensuring a participatory approach. Although the three districts of Pangani, Muheza and Tanga that make up the Tanga region continued to serve as the primary focus areas for project activities over the three-year life of the project, other regions such as Mtwara and Lindi were also covered through support activities for policy and regulation and also training activities as explained in the activities section of this report.

### **2.2.2. Target Products:**

The SEEGAAD project was designed to support a range of income generating activities that would enable smallholders to significantly increase their incomes. Soon after the award for the SEEGAAD project was made, a rapid sectoral assessment was conducted to analyze and prioritize target products that would maximize economic gains for rural smallholders while maintaining a net positive effect on environmental conservation. Among the range of products that were considered initially included sisal, sesame seeds, groundnuts, cashew nuts, cassava, goat husbandry and a range of marine products such as seaweed farming and fishing. The assessment conducted enabled stakeholders to identify seaweed farming as one of the

most promising products which involved a large number of producers and also had tremendous potential for increasing profitability and contributing to the dual goals of economic growth and environmental conservation. Consequently, project efforts in the first two years focused on promoting development of the seaweed industry in Tanzania. However, as efforts to promote development of the seaweed industry began to mature, additional income generating activities were identified as a means of diversifying incomes for coastal communities. These products included mud crab cage culture, prawn farming on salt farms and lobsters casitas, all high value products that were pilot tested in the later part of the project. A discussion of the specific support provided for these industries is included in later sections of this report.

### **2.2.3. Activity Components**

The sectoral assessment carried out at the beginning of the project enabled stakeholders to identify key opportunities and constraints towards increasing incomes for smallholders. An increasing demand for the target products and a support from the government as well civil society were identified as key opportunities while a lack of entrepreneurial capacity among smallholders and poor production practices were identified as major barriers towards achievement of the project goal. In addition, the need to further improve the policy and regulatory environment and enhance linkages to higher value markets were also identified as critical areas where the project could effectively intervene effectively. Consequently, a set of activities categorized under the components below were developed to guide the intervention strategy as discussed in later parts of this report:

#### Component 1: Business Skills Training

- a) Prosperity Workshops
- b) Business Skills Training I and II
- c) Seaweed Farming as a Business

#### Component 2: Extension Support Activities

- a) Seaweed farming
- b) Mud Crabs Cage Culture
- c) Lobster Casitas

#### Component 3: Expanding Market Linkages

#### Component 4: Association Development

#### Component 5: Enabling Environment

### 3. PROJECT ACTIVITIES

The project activities are hereby presented in detail organized into five basic components; business skill training, extension support activities, expanding market linkages, association development and improving the enabling environment. All SEEGAAD project activities were designed within a framework of integrated coastal zone management and conservation as outlined in the Tanzania Mariculture Development Guidelines publication. The guidelines were written by the Mariculture Working Group (MWG) is a cross-sectoral group of technical experts with a vested interest in the sustainable development of mariculture in Tanzania. (See Appendix D for a list of members). MWG works in partnership with the Ministry of Natural Resources and Tourism and outline a framework for the sustainable development of mariculture activities in Tanzania.

#### 3.1. Component 1: Business Skills Training

A key constraint facing rural smallholders in Tanzania is the lack of knowledge and skills on how to manage their income generating activities profitably. A common characteristic among the smallholders targeted for support was that majority of them were not accustomed to thinking of their activities as an investment which ought to be maximizing returns. This lack of a business orientation can be attributed to the fact that many coastal villagers have for years worked as laborers and not as self-driven entrepreneurs. In addition, Tanzania's *socialist* history and the fact that the country only recently adopted a free market economy approach are other factors that have for long contributed to stifled entrepreneurship in Tanzania particularly at the MSE level. Another factor is that a vast number of development programs that have been implemented in Tanzania over the years have involved highly subsidized support activities for the smallholder and this has in turn led to poor sustainability of these activities. A pillar of the SEEGAAD project approach was to minimize and, where possible, eliminate subsidies altogether. SEEGAAD focused on empowering smallholders by promoting market-based incentives for the adoption of improved business and production practices. Part of this strategy involved a series of training activities that would provide smallholders with the necessary knowledge and skills required to manage their enterprises profitably.

##### 3.1.1. Prosperity Workshops

A series of introductory level business skills courses known as “Prosperity Workshops” were developed in collaboration with a local training organization—Private Sector Initiative (PSI). The Prosperity Workshops were tailored to meet the needs of smallholders residing within the coastal regions of Tanzania and included leaders of community groups working in the seaweed industry and seaweed farmers. Prosperity Workshops for community leaders focused on giving the participants a broad understanding of the seaweed business as a whole and how it can increase the incomes of their communities. Participants were also sensitized on how to motivate their people to join seaweed farming as a means of poverty eradication. Prosperity workshops were conducted in each of the three coastal districts—Pangani, Muheza and Tanga---and included Village Chairmen, Secretaries of the Village Environmental Committees (VMCs) and the Councilors from the respective wards.

Workshops for seaweed growers were aimed at creating awareness as to the economic opportunities available in their communities for self improvement with seaweed presented as

an illustrative case in point. The grower's workshops had three modules held at intervals of 2-4 weeks all of which used a participatory approach:

- Module 1 was focused on imparting an entrepreneurial spirit among the growers and encouraging them to take up seaweed farming as an income generating activity.
- The second module covered basic business planning for seaweed farming and was meant to enable producers to understand how to allocate their resources, including time, appropriately to maximize profits.
- The third module was aimed at helping producers to identify and plan for a number of income generating possibilities as seaweed farming is mostly done as a part timer activity during the low tides.

The specific topics covered as part of the Prosperity Workshops included:

- Becoming an entrepreneur,
- The traits of an entrepreneur,
- Managing business and family cash,
- Understanding basic business practices, and
- Introduction to associations.

**Activity Output:** A total of 147 men and 273 women attended the Prosperity Workshops trainings. Ten training workshops were held altogether over a

### **3.1.2. Basic Business Skills Training I and II**

Business Skills I and II were a training series intended to build on the efforts of the Prosperity Workshops which again emphasized the concept of being an entrepreneur, known in Swahili as *mjasiriamali*, a relatively new word in the language. As the project progressed, it became apparent that many coastal villagers have over the years become accustomed to selling their labor into the value chain for a specific product such as seaweed. The SEEGAAD project hence embarked on a mission of empowering farmers to make choices about expanding their operations, hiring additional laborers, etc. as a means towards increasing their income. The Basic Business Skills training modules provided the participants with practical experience on how to describe and manage their income generating activities as businesses.

The Basic Business Skills Trainings complemented numerous coastal conservation activities in the area highlighting the economic benefit of protecting the fragile coastal area. Trainings were conducted in coastal villages in three districts – Muheza, Pangani and Tanga. Participants in the trainings learned and discussed about the free market business environment in Tanzania and how coastal villagers are part of that system. The sensitization also included some discussion about the benefit of sustainable business activities that allow for future planning to meet family needs. These introductory courses enabled smallholders to appreciate ACDI/VOCA's approach towards supporting business activities and also enabled the SEEGAAD staff to assess the exact needs of the participants including their literacy levels.

**Activity Output:** 347 women and 353 men participated in the Basic Business Skills Training offered by the project in three coastal districts of Tanga region-Muheza, Pangani and Tanga Municipal.

### 3.1.3. Seaweed Farming as a Business

Over the years, ACDI/VOCA has developed and applied a sound business practices curriculum for farmers known as “Farming as a Business” (FaaB). FaaB was initially developed in Uganda and its application was later expanded to Kenya as apart of the USAID funded Kenya Maize Development Program implemented by ACDI/VOCA. In April 2004, ACDI/VOCA staff working on the SEEGAAD project traveled to Kenya where they received training on FaaB and were hence able to develop a tailored curriculum for seaweed farming as a business (SFaaB) applied in Tanzania. The main trust of the SFaaB curriculum was to guide the participants through a strategic planning process for increasing returns for their seaweed farming activities. The initial training sessions of SFaaB covered the following topics:

1. Introduction to basic business concepts and vocabulary
2. Describing current seaweed farming practices as business activities
3. Improved farm management
4. Profit and pricing
5. Work planning an record keeping

A key tool introduced as part of the SFaaB curriculum was the Project Income Statement (PIS) which is a valuable tool in forward planning for farming activities. The Seaweed Farming as a Business training activity was conducted by SEEGAAD staff in villages in Mtwara and Lindi Regions in the southern part of Tanzania. The district fisheries officers participated in the training and were encouraged to follow-up with the coastal villagers to provide guidance as these new concepts were adapted into practice.

**Activity Output:** A total of 19 men and 226 women were trained in SFaaB. The trainings were conducted in the villages of Pemba Pwani, Mgao, Naumbu, Mkungu in the Mtwara Region and Kwale, Bagamoyo, Tawalani, Mtundani and Boma Kichakambia in the Tanga Region.

## 3.2. Component 2: Extension Support Activities

### 3.2.1. Seaweed farming

Commercial seaweed farming in Tanzania began in 1989 and although Tanzania is a relatively small player in the global market, seaweed farming provides incomes for over 5,000 households. Over the last three years, the SEEGAAD project has supported seaweed farming in Tanzania as a viable means of significantly increasing incomes for many smallholders along the coastal regions. There are two types of seaweed varieties predominantly grown in Tanzania, *Eucheuma Spinosum* commonly known as *spinosum* and *Kappaphycus alvarezii* commonly known as *cottonii*. Of these two varieties, *cottonii* contains the *kappa* carrageenan which is a stronger and more rigid gel mostly used in the manufacture of pharmaceuticals and food products whereas *spinosum* contains *iota* carrageenan. *Iota* carrageenan is a softer and less rigid gel compared to *Kappa* and is used in the manufacture of toothpaste. When it comes to beach prices, *cottonii* fetches on average 3 times as much as

*spinosum* per unit price and hence the SEEGAAD project opted to promote the expansion of the higher value *cottonii* variety.

A core activity of the SEEGAAD project was working with various actors in the seaweed sector to increase productivity as listed below:

a) Expanding production in the Tanga region

SEEGAAD has been instrumental in assisting exporters to identify and establish new production sites in the northern coastline. At the start of the project, only one exporter (ZASCOL Ltd.) out of the four operating in Tanzania was operating in the Tanga region. In 2003, ACDI/VOCA assisted two exporters (Birr and Zanea) to establish trials in a number of villages within the region to expand production. At the same time, SEEGAAD provided support to ZASCOL Ltd. to increase the number of farmers they working with and to address production constraints. At the end of the project, the number of seaweed farmers in Tanga region had increased to 2321 from 276 in 2002.

b) Increasing efficiency of outgrower model

Productivity in the Tanzanian seaweed industry has always been relatively low compared to other regions in the world partly because of the inefficient model through which exporters have worked with producers to expand production. Traditionally, exporters have distributed inputs to a large number of producers who are individually tending a very small number of lines (typically less than 20 lines) and hence their productivity is low per labor hour and exporter costs are high per ton of seaweed purchased. With seemingly little money to be earned, farmers tend to treat the farming as casual income rather than a primary source of income.

The SEEGAAD project worked to promote a more efficient outgrower model whereby exporters were encouraged to initially start working with a select group of highly productive farmers who serve as lead farmers to exemplify best practices for others. This model allows exporters to concentrate their support on a small number of farmers initially who can achieve high productivity through close monitoring. SEEGAAD worked with both exporters and farmers to ensure that each village has a number of model farmers each of whom is following best practices and is earning \$80 or more a month. The project staff members also encouraged exporters to motivate producers by setting target production goals for productive farmers and ensuring sufficient supply of the necessary inputs to reach and exceed the production levels of the model farmers.

Table 1. Top seaweed producers in Tanga

Village	High volume producers – seaweed farmers managing more than 90 lines
<i>Kijiru</i>	4
<i>Mchukuuni</i>	5
<i>Mikocheni</i>	3
<i>Mkwaja</i>	2
<i>Tawalani</i>	2
<i>Ushongo</i>	4

It was also deemed important for farmers to have a clear understanding of what is possible, including additional production techniques utilized in other countries needed to facilitate production of a ton or more of *cottonii* per month. Towards this end, the SEEGAAD project facilitated an exchange tour for a number of promising farmers from Kijiru village in Muheza district who visited production sites in Zanzibar and Pemba. During the tour, the farmers

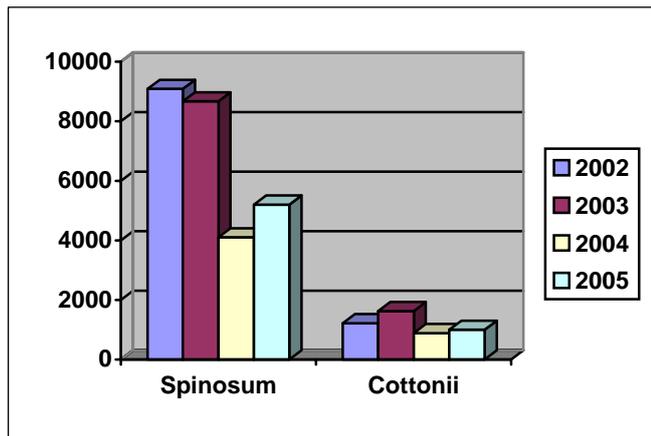
from Kijiru village picked up a number of important lessons including the advantages of hiring labor during the peak seasons to overcome some of the production bottlenecks.

c) Biological and environmental constraints

Over the years, production of *cottonii* in Tanzania has been hampered by a number of environmental and biological constraints as listed below. For many of the problems there are effective countermeasures that farmers should be taking. However in many cases, it became apparent that local extension agents lacked adequate knowledge to offer effective extension support to counter these constraints. A critical intervention undertaken by the SEEGAAD project was to build capacity for provision of effective extension services by working with the private and government extension agents to address production constraints. Among the key constraints addressed included:

- The occurrence of Epiphytic Filamentous Algae (EFA) which is often triggered by heavy rains and the resultant low salinity of the water has been one of the most serious problems hampering the growth of the *cottonii* industry in Tanzania. Once the problem becomes serious there is little that can be done but to harvest the seaweed, wait a sufficient time for the infection to leave the area, acquire clean seed stock from another area, and start again. The SEEGAAD project worked with extension agents to promote two critical practices that can reduce losses from EFA. 1) Monitoring the salinity of water and weather conditions so as to advise farmers to move the seaweed to deeper more saline water before EFA erupts and 2) encouraging farmers to move their seaweed farms from areas close to rivers and water runoff points to areas where they will not be affected.
- Low tolerance to high water temperature is the likely cause of the tremendous problem with die-off in 2005 (see Table 2). Exporters have also been very vocal about the need to develop a more heat-resistant strain of *cottonii* suited for Tanzania. In response to this situation CP Kelco, an international seaweed buyer working with one of the local developers, introduced a new variety of the higher value *Kappaphycus striatum*, commonly known as *cottonii*, which has a higher tolerance to fluctuations in temperature and salinity. The trials for the new variety began in October 2005 and although the strain is heartier, it is also more brittle and prone to breaking during periods of strong winds. By the time the project was ending, the new seed stock was being expanded to nearly 10 villages in Tanga and a full-time technical advisor had been assigned to the region to assist farmers with production and monitor the success rates.

Table 2: Seaweed production figures show the significant problems with die-off in 2004 (MT/year)



In June 2005, the SEEGAAD project collaborated with the University of Dar es Salaam’s Institute of Marine Science (IMS) to carry out site trials for seaweed production in different locations along the northern coastline of Tanzania. The study compared a standard set of

parameters in 6 villages in the Tanga region with varying degrees of die-off to determine what variables seem to have the highest significance. The parameters included geographic position, depth, epiphyte weight/unit weight of seaweed, point source effluent (fresh water inlets), rainfall data, salinity, current speeds, etc, measured over a 24-hour period. The study findings were in line with the hypothesis that temperature is likely to be one of the contributing factors to die-off. The higher value *cottonii* does not have a large tolerance for changes in temperature. In the intertidal zones where current flows are low; the water in the seaweed farm is able to heat to beyond the tolerance level of the current strains.

National Production levels of *cottonii* at the end of 2005<sup>7</sup> were at approximately 1,000 MT per year. This is compared to a total of 1,222 MT produced in 2002. The lower value *spinosum* is currently harvested at approximately 5,000 MT per year down from 9,088 MT in 2002. Although national production of seaweed has declined over the past three years, participants in the SEEGAAD project area nearly doubled the tonnage of seaweed harvested between 2004 and 2005. The increase from 980,000 kgs/year to over 1,876,000 kgs/year (nearly a 40% increase) was due to the implementation of new farming techniques, expanding seaweed production to new villages, and re-starting seaweed farms that had been effected by problems with die-off.

- When the water is coolest, the seaweed is often grazed by herbivore fish particularly Rabbit Fish. This is especially destructive as the fish prefer the growing tips of the *seaweed* causing stagnation and die-off. In December 2004, ACDI/VOCA volunteer consultant and aquaculture expert, Dr. Michael Rice, carried out a three week assignment and was able to provide some insight on ways of countering this problem. Dr. Rice recommended countermeasures that included the setting up of cages to contain the fish which can then be sold for additional income. The farmers were also urged to move their seaweed to deeper waters and keep it off the bottom since the herbivore fish are bottom feeders.

d) Improving farm management

The SEEGAAD project promoted a number of techniques to help improve efficiency and productivity at the farm level. One of these techniques was the use of rafts to transport the seaweed to shore rather than carrying the seaweed on one's back. In collaboration with one of the exporters, SEEGAAD provided three boats to the best performing groups of producers to be used in transporting seaweed to shore. Use of boats or rafts saves time and energy enabling producers to spend more time tending to their lines and expanding their farms.

SEEGAAD also assisted seaweed farmers to improve post handling of harvested seaweed. A common complaint made by exporters is that the seaweed provided by farmers in most villages was often filled with impurities and this meant that they could not secure competitive prices in the world market due to the added cost incurred in cleaning the seaweed. SEEGAAD produced informational posters on appropriate post harvest techniques and distributed the posters to the various collecting points as a ways of raising awareness among producers. In addition, the project also trained farmers to construct raised drying racks so that the seaweed would be dried above the ground to avoid contamination e.g. from sand, goats, chickens etc. As an incentive, the project provided plastic covers to those producers who had constructed raised drying racks to cover the seaweed during the night and also when it rains.

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<sup>7</sup> Information provided by the exporters as reported to the Division of Fisheries

A SEEGAAD volunteer consultant<sup>8</sup> from the Solomon Islands recommended the introduction of the Indonesian deepwater farming method to counter this problem. Trials, which were still on-going by the end of the project, were set up to assess the suitability of this method to the Tanzanian situation. The Indonesian method of deep water farming involves staking poles in 3-6 meters of water (3 m in rough seas, 6 m in calm seas). This

Long line seaweed farm plot  
Photo by: Rory Stewart



Harvesting seaweed off-shore in Kijiru village  
Photo by: George Mendes



method is an excellent option for Tanzanian seaweed farmers because water temperature in deeper water has less variability than the surface water. The higher value *cottonii* has a very low tolerance for variability in temperature and the high surface water temperature is a major cause of seaweed

die-off in Tanzania. Although expanded deep water seaweed farming would certainly lead to increased production in Tanzania, there is a major limiting factor to success. Deep water seaweed farms require that someone swim below the surface of the water to attach the lines, check growth, etc., and most seaweed farmers in Tanzania are women, very few of whom swim. In January 2005 Indonesian method deep water seaweed farming trials were therefore started in 4 villages. The activity was introduced as family businesses; the men would bring lines up to women who were in boats who would harvest the seaweed and tie new seed stock. The deep water method is still in a trials phase. Long-term success will depend on the shift in how the seaweed farms are managed. Currently seaweed farming is generally done only during the spring tide periods – about 10 days per month. Deep water farming requires more regular visits during the month to ensure the farm is well maintained.

<sup>8</sup> Mr. Rory Stewart is a mariculture expert who in August 2004 carried out a three-week volunteer assignment to assess ways of improving productivity in the Tanzanian *cottonii* industry.

e) Reducing sea user conflicts

On a number of occasions, farmers reported that their seaweed farms had been destroyed by fishermen using poisons to kill the fish. While such fishing is illegal, it was for a long time considered relatively harmless and had hence not been a focus of law enforcement efforts. However, in early 2005, producers in Mkwaja and Mikocheni villages lost their entire crop as a result of this poison fishing forcing stakeholders to seek means by which to address this problem.

The SEEGAAD project, in collaboration with the department of Fisheries officials and TCZDP, worked with villagers to find effective mechanisms to address these kinds of sea user conflicts. This included tightening enforcement by working with the villagers through their village environment committees to identify the culprits and have them prosecuted in accordance with the law. The SEEGAAD project further sought to reduce such sea user conflicts by establishing business associations within each village that would also serve as a platform for addressing conflicts that negatively impact profitability of members' businesses.

### 3.2.2. Mud Crab Cage Culture



During the third year of the project, SEEGAAD expanded to other mariculture products beginning with mud crab (*Scylla serrata*). There is a very high demand in the global market for quality mud crab from this region and it is a very lucrative export business in Tanzania. A rapid analysis of the mud crab subsector carried out at the start of the activity in 2004 quickly highlighted the fact that much of the stock harvested from the wild was low value juvenile stock in the 200-300 gram range. These small crabs are often sold to local villagers for less than \$.20/each. In 2005, an ACDI/VOCA volunteer and a local marine product exporter suggested that mud crab cage culture could be an outlet for the juvenile crabs where they could be managed in a culture environment specifically for higher value markets.

In December 2004, SEEGAAD staff visited the Kwetu Training Center in Mombasa, Kenya to meet with Ms. Elgin M. Arriessgado, a Voluntary Service Overseas (VSO) volunteer from the Philippines, and mud-crab expert assigned to the Coral Reef Degradation in the Indian Ocean (CORDIO) project also based in Mombasa. The Kwetu Center trials were set up in a study plot and managed by Ms. Arriessgado and her staff. The trials successfully demonstrated that the simple cage designs were suitable for growing and fattening mud crab. Two weeks after the visit, mud crab cage culture trials were established in two villages in the SEEGAAD project area. The sites were selected based on suitability for the cages, village interest, village government support and participants with previous experience harvesting crab from the wild.

After 3 months (in May 2005) there were 4 villages involved in the trial with varying degrees of success. Ms. Arriessgado volunteered technical assistance to the SEEGAAD project. She visited each of the trials sites accompanied by representatives from each village, district fisheries officers and project staff. The site visits resulted in a complete debriefing and suggestions for improving the trials. See Table 3. The recommendations were shared with the participants in the mud crab cage culture trials, district fisheries officers and other

stakeholders. Ms. Arriessgado also developed a simple manual for mud crab cage culture that has been translated into Kiswahili that was printed in November 2005 and made available to all stakeholders.

Table 3. Sample of the mud crab cage culture assessment carried out under SEEGAAD

Site	General Description	Culture Set -up		
		Description/Observations	Effects/indications	Recommendations/remarks
Putini	<i>Near the sea, hence no problem good water exchange</i>	<i>Spacing on staking and covers wider; No top lining and yet sticks are not leveled</i>	<i>Permits high incidents of crab escapees &amp; cannibalism</i>	<i>Insert additional sticks in gaps, insure good fitting between cage cover &amp; cage compartments; Put a top lining an or levelled the tip of sticks</i>
	<i>Substrate for mud crab culture is suitable</i>	<i>Sticks are strong and durable</i>	<i>Longer life span Increased number of culture cycles</i>	<i>Ok but need to find alternative materials other than mangroves</i>
	<i>Potential areas for expansion</i>	<i>Some portion of cage is constantly submerged even during low tides</i>	<i>High mortality occurrence during molting period</i>	<i>Construct or deepen natural channels to allow water to runs it; add substrate to increase elevation</i>
	<i>Presence of some small channel areas</i>	<i>Occurrence of debris and leaves inside the cage compartments</i>	<i>Interfere molting activity of the crabs</i>	<i>Regular clean p of cages</i>
	<i>Relatively far from village</i>	<i>Underfeed crabs</i>	<i>Non molting of any crabs within one month period since stocking</i>	<i>Increase feeding ration and frequency</i>

Once the trials proved successful, a mud crab value chain analysis was conducted through which three distinct market channels for mud crab were identified. The mud crab value chain is discussed in greater detail in the Value Chain Analysis section below. Exporters of high value mariculture products such as mud crabs participated in the mud crab stakeholder meetings and have started to negotiate purchase contracts based on market quality standards and quantity. The relationship between the MSEs and the buyers and exporters will strengthen as the mud crab cage culture participants improve the culture management. One key piece of information highlighted in the value chain analysis was the need to know the extent to which the mud crab cage culture could expand before depleting the juvenile stocks of mud crabs to a critical level.

In response to this important management factor, the SEEGAAD project commissioned a survey of the natural stock of mud crabs and several other potential mariculture species in the Tanga region. The study was conducted by the Tanzania Fisheries Research Institute (TAFIRI) and the study results revealed that the juvenile natural stocks of mud crab in the wild are very healthy (see Table 4). In the Tanga region, the mud crab cage culture could continue to develop for several years before a crab hatchery would be required. As

mariculture develops in Tanzania, practitioners, exporters, government officials, NGOs and others must work to ensure quality information required to understand the status of natural stocks, take-limits and other parameters is available and accurate.

Table 4: Juvenile Crab abundance and biomass estimates for Pangani and Putini River Systems

District	Village	Mangrove forest cover/shoreline area for juvenile capture operations (ha)	Density index (Crablets/616 m <sup>2</sup> )	Computed crablets biomass index (Kg/616m <sup>2</sup> )	Computed Abundance (N)	Computed crablets Biomass (Kg/ha)	Computed crablets Biomass (MT)
Pangani (Pangani River System)	Mashine ya Maji/ Matakani	400	40*(@ 50g)	2	259,740.26	32.47	12,987
Tanga (Putini village system)	Putini	7.5	20*(@ 50g)	1	2,434.50	16.24	6,493.51

The most significant figure to note is that at the time of this stock assessment in October 2005, there were nearly 20,000 juvenile crabs in only two of the river systems in the Tanga, albeit the most productive. Although there is no immediate danger of depleting the natural stocks of mud crab, the authors of the natural stock survey indicate that a similar study should be conducted at different times throughout the year to build up a central data base that be accessed by potential investors, policy makes and conservation organizations.

### 3.2.3. Lobster Casitas



As part of a survey of mariculture opportunities in the Tanga region, the Kigombe lobster divers and the Director of a Tanga-based seafood exporting company, Sea Products, Ltd., suggested that SEEGAAD staff explore the possibility of constructing lobster shelters or *casitas* nearer the shore in places such as Kigombe village. The area has an abundance of lobster, but the reef is a distance from shore and large, export size lobsters tend to be difficult for the local divers to collect. As a result, the slightly smaller lobsters are harvested and sold for a discounted price. Lobster shelters closer to shore would attract the export-size catch and provide an incentive to leave the smaller lobster to mature.

In December 2004, SEEGAAD initiated a lobster casita trial in Kigombe village. The shelters were designed as 3-sided cement structures and 20 units were constructed. By early January 2005, the participants and other stakeholders identified the ideal location for the casitas which were placed in four different groupings at a depth of 6-7 meters. The units were arranged randomly in a 10 meter<sup>2</sup> quadrant, each quadrant was approximately 60 meters apart in a line parallel to the shore approximately 300m from the high-tide line. The transformation of the cement block shelters into marine sanctuaries suitable for adult lobsters was monitored by the participating villagers and TCZDP. Due to seasonal wind patterns harvesting from the shelters was only possible in November 2005; 10 months after the structures were first placed. An earlier site visit done in July 2005 revealed that the shelters were initially acting

as fish aggregating devices for schools of red snapper. However, when the winds were favorable for the lobster divers to harvest, SEEGAAD partnered with TCZDP to conduct an underwater survey of the area which revealed that the casitas had integrated into the marine environment and were serving as excellent shelters for lobster. In November, the lobster group harvested 124 kgs of lobster that was sold for over US \$1,000. Mr. Eric Allard, the director of Sea Products, Ltd. has identified other areas where lobster casitas may be suitable and the activity is likely to expand in 2006.

#### 3.2.4. Prawn farming



The Tanga Salt Producers Association is an organization of about 20 producers of solar-evaporated sea salt. Early in the implementation of the SEEGAAD project, the producers requested technical assistance in outlining the requirements for using the salt ponds<sup>9</sup> for prawn farming during the rainy seasons when the salt cannot be harvested.

Results from a rapid market analysis indicated that there is a strong local market for prawn, and that penaeid shrimp could be produced in salt work ponds. Research indicated that *penaeid* shrimp can be produced in salt work reservoir ponds on either an extensive or semi-intensive basis. In early 2004, a SEEGAAD volunteer consultant, Dr. Louis Landesman, carried out an assignment to assess the feasibility of the prawn production activity in the Tanga region and concluded that successful *penaeid* shrimp culture on an extensive basis required that a source of post-larval shrimp be identified, either caught from the wild or purchased from a hatchery. Following the assessment, an expert from a local prawn exporting company, Anil Konnavil from TanPesca Ltd. provided technical guidelines on how the salt pans needed to be modified to accommodate prawn farming to the Tanga salt producers. Mr. Konnavil further concluded that the reservoir ponds would need some minor alteration including improving their intake and outlet structures and installing screens to prevent predators from entering these ponds that might feed on larval shrimp. An analysis of expected returns conducted showed that with a stocking density of 1 to 3 post-larvae per square meter, each individual shrimp should grow to a size of 30 grams or more, producing up to 300 kg per hectare of shrimp in 4 months time. It was estimated that this would provide an additional income of about \$2,000 for each crop of shrimp sold. However, the lack of a reliable source of post larval shrimp was identified as the main limiting factor.

In November 2005, TanPesca Ltd. opened a large prawn hatchery on Mafia Island which may serve as a supply source for high quality post larval shrimp. The hatchery is expected to be on a trial phase through April/May 2006. Although the SEEGAAD project provided the framework for the prawn farming to being in the Tanga Region, the Tanga salt producers association will need to secure adequate seed stock to stock the salt pans for prawn farming during the rainy season when salt cannot be harvested.

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<sup>9</sup> Salt production in Tanga occurs in a series of reservoir ponds in an area on the coast that uses solar evaporation of seawater. This technology of evaporation ponds and crystallization ponds has been taking place for many years in Tanzania and Eastern Africa. (Landsman, 2004)

### **3.3. Component 3: Expanding Market Linkages**

An important aspect of the SEEGAAD project was assisting project clients to increase their sales by facilitating expansion of market linkages. Towards this goal, the SEEGAAD project undertook two critical activities as follows:

#### **3.3.1. Value Chain Analysis**

The SEEGAAD project championed the idea of conducting value chain analyses for given commodities as an effective means of enabling stakeholders to better understand and pursue their competitive advantage. Prior to the project, no value chain analyses had ever been conducted for mariculture products in Tanzania. In June 2005, the SEEGAAD project commissioned a value chain analysis study (VCA) of the mud crab industry in Tanzania aimed at informing stakeholders about the structure, opportunities and constraints related to the industry. The VCA was carried out in collaboration with a local consulting outfit, Match Maker Associates (MMA). In addition to conducting interviews with various players in the industry, a workshop bringing together key stakeholders including the private sector, Chamber of Commerce, government officials, representatives from banks, crab traders and producers as well as local hoteliers was carried out to validate the findings. The VCA identified three distinct market channels for mud crabs in Tanzania namely; a local market which consists of high end hotels and restaurants, an export market for live mud crabs mostly exported to Asia and an export market for frozen mud crabs exported to Europe and South Africa. A value chain map of the mud crab industry is attached in Appendix E.

In addition to providing useful information to stakeholders in the mud crab sector on market opportunities for their products, the VCA study has been a useful tool in illustrating the components of a sound market orientation to all alternative livelihood activities in the coastal areas. There are many examples in coastal areas of well-meaning income generating projects that were highly subsidized and often resulted in the participants having little success in securing better markets for their products.

#### **3.3.2. Linking smallholders to high value markets**

The value chain approach allows stakeholders to see how the actors in the industry are connected and the various market channels available. The VCA for the mud crab industry in Tanzania provided stakeholders with a clear picture of the various sales channels for mud crab as well as thorough profitability analyses to illustrate the sales options available to MSEs. Through the study, SEEGAAD project staff members established good relationships with private sector partners and facilitated backward linkages between exporters and smallholder producers.

The SEEGAAD project also assisted smallholders to establish effective business linkages with buyers of their products through capacity building for associations. For example, seaweed was being rejected by the developers/exporters due to high sand content and high moisture content. SEEGAAD staff along with the exporters, field agents and government staff worked with producer groups to construct drying racks and protect the harvested seaweed from rain. By the end of the project 80% of all seaweed farmers in the project area were applying at least one of the improved post-harvest technologies.

Demonstration sites were also established to field test various techniques that might increase yield and/or improve product quality. These sites were always established in partnership with producers and, when possible, supported by the export market and included deep water seaweed farming, seaweed rafts, mud crab cage culture, and lobster shelters.

### 3.4. Component 4: Association Development

Association development was one of the key project activities of the SEEGAAD Project. The legacy of cooperatives in Tanzania is such that many people were very skeptical to sell collectively and many coastal villagers do not fully understand how the free market economy in operates and how they can actively participate. Additionally, people living in the Tanga Region have historically sold their labor into supply chains e.g. in the sisal, tea, and seaweed industries leaving many coastal villagers with minimal business management skills. The association development activities were introduced in both the Prosperity Workshops and Business Skills trainings. The comprehensive association development module was then introduced as a separate component, beginning with a series of sensitization sessions that provided examples from some of the numerous associations in the Tanga Region. Tanga Fresh Dairy and the Muheza Orange Growers' Association, who for example have been able to increase profit margins on their products, negotiate bulk transport contracts and solicit specific training for their members.

Initial training activities in this area focused on introducing the concept of association development in the 21<sup>st</sup> century, which highlighted some of the benefits that members expect to gain. Once potential members registered with the local government, association members elected leaders. Once leaders where elected, the villagers developed a constitution that included issues unique to each location.

Association development training activities included:

- ❖ Sensitization
- ❖ Introduction to Associations
- ❖ Constitution Development
- ❖ Leadership Training
- ❖ Visits to strong associations in the Region
- ❖ Strategic Planning

Leadership training was held in two separate sessions, and was the catalyst for leaders and members to take ownership of the association. A summary of membership in the nascent mariculture association can be seen below in Table 5.

Table 5. Mariculture Producers Association Membership

	Village	District	Men	Women	Total
1	Kijiru	Muheza	30	25	55
2	Mtundani	Muheza	34	20	54
3	Tawalani	Muheza	22	19	41
4	Mikocheni	Pangani	18	21	39
5	Mkwaja	Pangani	26	18	44
6	Ushongo	Pangani	53	23	76
7	Kipumbwi	Pangani	28	12	40
8	Kiwavu	Tanga	68	30	98
9	Tongoni	Tanga	39	6	45
		<b>TOTAL</b>	<b>318</b>	<b>174</b>	<b>492</b>

Although the SEEGAAD project was successful in facilitating the development of mariculture producer associations, it is worth noting the process was not entirely smooth. The registration process for the associations was difficult; often the district officials did not understand their role in the process which requires that villagers get a letter of acknowledgment that the groups exist and that the district can validate the kinds of association activities listed. The process of getting this letter caused many months of delays in a process that was already very time-consuming. A second difficult point in the association development process was the issue of access to credit and capital. In all of the strategic planning sessions that were conducted, members listed lack of capital as a major constraint to their ability to successfully operate as an association. There are a number of savings and credit schemes that are well-known in Tanzania, but especially along the coastal areas, the repayment rates are notoriously well below 50%.<sup>10</sup>

Representatives from Cooperative Rural Development Bank (CRDB) bank who locally manage all loans given through the Private Agriculture Support Services (PASS) project visited one of the associations supported by SEEGAAD. Members were encouraged to open a bank account at a commercial bank in Tanga and build up a balance in a savings account that is linked to a clear financial plan of the association in order to demonstrate responsible financial management. Although the associations developed under SEEGAAD did not meet the criteria to participate in the PASS project or other similar program, the producer association members have made the contacts and are aware of how they need to develop in order to access capital.

### **3. 5. Component 5: Enabling Environment**

In order to ensure sustainable linkages between the coastal villagers and the buyers and traders, sufficient training had to be provided so villagers would understand how they can fully participate in Tanzania's free market economy. Throughout the implementation of the project, meetings were held that included private sector, government at the national, regional and district levels to discuss how to enhance the business-orientation of mariculture development in Tanzania. The Division of Fisheries is aware that increasing competitiveness of Tanzanian products must be a priority issue and are interested in learning more about the value chain approach and shifting the focus from primarily working with production systems to supporting the entire industry.

### **3.6. Other Components:**

#### ***3.6.1 Appropriate technology***

Access to fresh water is a major issue for most coastal villagers in the Tanga region. Many coastal villages have to buy drinking water on a daily basis and travel long distances to find suitable sources of fresh water. Although access to water is very limited, there was no local rain water harvesting systems in any of the coastal villages where the SEEGAAD project was

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<sup>10</sup> Personal Interview, May 2005, Mr. Thomas Challe, Mafia Marine Park SACCO manager.

working. A local NGO, Kaluluma, was hired to train a group of masons from 6 villages in the region how to build rain water harvesting jars and household water storage containers.

The simple cement design is commonly used in many parts of Arusha, Kilimanjaro and Mwanza regions. The Tanga training included 2,000 liter rain water harvesting jars, 200 liter water filter jars, 200 liter household water storage jars and 40 liter drinking water storage jars. The household water storage jars are an excellent alternative to the 5-gallon buckets that are normally used for water storage as they include a small tap at base of the jar so family members do not need to dip a cup into the bucket, which can contaminate the drinking water for the family. The cement jars have the added benefit of keeping the drinking water cool – a welcome feature in the hot and humid coastal climate.



Villagers building the mold for the rain water harvesting system. Mwaboza Village, October 2005  
Photo by: Frida Urio



The finished product – A 2000-liter rain water harvesting jar Mwaboza Village, October 2005  
Photo by: Frida Urio

### 3.6.2. Gender Mainstreaming & HIV/AIDS

A survey of all projects, organizations and institutions working on HIV/AIDS activities in the Tanga Region was commissioned by SEEGAAD in March 2005. The final product was a directory of the HIV/AIDS activities that included the organization, a summary of the activity and contact information. Copies were made and distributed to all participants and other groups and organizations in the Region. The feedback was very positive and the activity provided SEEGAAD staff a means of identifying potential partner projects.

In June 2005, a gender evaluation was conducted of the SEEGAAD project and a number of practices were revealed that SEEGAAD staff addressed in hopes of improving our ability to mainstream gender into the program activities. SEEGAAD staff worked to increase gender awareness in the project areas by facilitating information exchange at the village level and ensuring that knowledge and information about program activities goes beyond the privileged few. Capacity building activities for gender integration included establishment of a gender library in the SEEGAAD office and promoting accountability for gender issues by designating a key staff member who will serve as a Gender Coordinator for the project.

In June 2005, ACDI/VOCA volunteer consultant and Gender Specialist, Renée Cammarata, carried out an assignment aimed at enhancing the capacity of the SEEGAAD project and collaborating partners to effectively institute gender mainstreaming and HIV/AIDS mitigation into project activities. The volunteer consultant conducted a (ToT) workshop for various stakeholders working in Pangani district and the SEEGAAD team. The training provided an opportunity to test the gender tool kit that was designed in the field during the assignment. The gender training tool provided SEEGAAD staff, gender trainers, district staff and other the framework for effectively including gender training into field activities. In November 2005, a ToT program was conducted by the designated gender coordinator the participants included five community development officers from the village, district and regional level.

### ***3.6.3. Information Communication Technology (ICT)***

SEEGAAD, in collaboration with the West Indian Ocean Marine Science Association (WIOMSA) solicited interest in the formation of a mariculture network for the West Indian Ocean Region. A Consultant hired through WIOMSA presented basic parameters for the mariculture network that was presented to the WIOMSA board of directors, and ACDI/VOCA volunteer, Mr. Ian Husting outlined possible technology options and system requirements to build the system. The lead designer of the West Indian Ocean Mariculture Network, Dr. Bob Bowen from URI/CRC is working in partnership with several organizations to develop a larger data management system for coastal zone managers in the region. As this network develops, it will link mariculture practitioners such as researchers, business owners and others in the region and around the globe to share resources, materials and other information.

### ***3.6.4. Use of Volunteers and Consultants***

ACDI/VOCA has over 40 years of experience recruiting and fielding strong volunteer consultants that bring in high quality technical expertise to the project. The SEEGAAD project fielded 9 volunteers. The volunteers were a valuable resource to the SEEGAAD project and to stakeholders in the various sectors in providing new and useful information. The table below outlines the general value addition to the project from the talented and qualified group of experts who volunteered their time to assist with our efforts in the field:

Table 6. ACDI/VOCA Volunteers to the SEEGAAD Project

	Name	Assignment	Dates	Output
1	Dr. Louis Landsman	Feasibility assessment for prawn farming in salt pans	March 2004	Held initial meetings with the Tanga Salt Producers Association. Conducted assessment of salt pans in the Tanga Region to determine suitability for prawn farming. Outlined basic requirements for small backyard hatchery, and identified possible sources of local feed production.
2	Rory Stewart	Seaweed production	August-September 2004	Raft method trials were started in Kijiru village. Introduced framework of financial agreements between local producers and exporters. Much of the information presented was incorporated into the Seaweed Development Strategic Plan that was approved by the Ministry of Natural Resources and Tourism in June 2005.
3	Dr. Michael Rice	Mariculture	December 2004-January 2005	Review of mariculture opportunities in Tanzania. Dr. Rice has continued to provide the project with updated technical information as well as promote the business orientation to other groups/businesses working in the West Indian Ocean
4	Nicholas Sabwa	Review of the project Monitoring and Evaluation system	January-February 2005	Improved the project M&E data collection and management system
5	Renee Cammarata	HIV/AIDS mitigation and gender mainstreaming	June-July 2005	Developed gender assessment tool for the SEEGAAD project and field tested it in Pangani District. Conducted ToT for community development officers.
6	George Mendes	Analysis of mariculture business development prospects in Tanzania	August 2005	Developed a mariculture business strategy.
7	Ian Husting	Webpage design	November 2005	Outlined requirements for developing a web-based mariculture network and identified several design options that were presented to WIOMSA. Assisted with networking computers within the office.
8	Vincent McCloskey	Training Strategies	December 2005	Assessed current training practices, provided a training document for developing and strengthening training methods, and conducted a short workshop on adult training techniques.

In addition to the short term technical assistance provided to the project by ACDI/VOCA, numerous local consultants were also contracted for a variety of services that filled in critical gaps in the project implementation. All of the consultants contracted worked closely with SEEGAAD staff to provide an opportunity for staff development and to ensure the final product would have the maximum possible benefit to the project. A list of all consultants hired by the SEEGAAD project along with a short description of the kinds of services provided can be reviewed in Appendix C.

#### 4. CONTRIBUTION TO INTERMEDIATE RESULTS

SEEGAAD contributed to USAID Tanzania Strategic Objective 9: “Increase Micro and Small Enterprise Participation in the Economy”

##### *IR9.1 Policy Environment*

- The SEEGAAD project has been effective in demonstrating how policies geared towards the enhancing economic development prospects can be implemented successfully. Testimonials from senior level officers in the government prove that the SEEGAAD project contributed effectively to a range of national policies and strategies e.g. the Seaweed Development Strategic Plan.
- SEEGAAD was instrumental in promoting a business oriented approach for conservation and livelihoods improvement activities. This is line with the national poverty reduction strategy and the national strategy for the development of the fisheries sector and coastal zone management
- SEEGAAD staff partnered with Tanga Coastal Zone Conservation and Development Project staff in developing a comprehensive national strategy for addressing the growing problem with dynamite and poison fishing. SEEGAAD facilitated anti-poisoning patrols in collaboration with the communities to apprehend the culprits. The project also emphasized the need to for communities to be vigilant in curbing dynamite fishing by highlighting the impact of such destructive practices on the environment and how this affects their businesses.
- SEEGAAD facilitated a forum for public and private sector interests in the mariculture industry to address policy issues affecting the industry e.g. within the seaweed industry.
- Government supported mariculture activities by assisting to clarify their role in terms of policy, legislation, regulation, and security and monitoring. However, there was very poor understanding by the government as to their role in supporting private sector development, including market development. Information and regulation are public functions, but government officials are very unclear and unsure on the extent to which public funds should be used to seemingly ‘subsidize’ the private sector.

##### *I.R. 9.2. Access to Market*

- The SEEGAAD project assisted smallholders acquire the knowledge and skills needed to expand markets for their products.
- SEEGAAD applied the value chain approach to help stakeholders in the Tanzanian mariculture industry to better understand and enhance their competitive advantage in the global market.
- The project assisted smallholders to establish successful business linkages with exporters
- SEEGAAD demonstrated how public resources can facilitate a business-oriented approach to coastal development.
- SEEGAAD supported the practical development of villagers’ mariculture businesses by helping coastal producers understand more about markets and marketing, and

“In terms of poverty alleviation, SEEGAAD is an important tool in making a market economy and local enterprise development work in coastal areas. In this sector it is a particularly important point as ‘traditionally, mariculture activities in the Tanga region have been considered as aid or assistance projects, and not necessarily as the profitable opportunities of business development that they have the potential to be.’” (Lewis 2005)

empowering them through skills, information and knowledge to explore options. This is important not only for the immediate benefits themselves, but also for the establishment of a wider development model.

- In Tanga, there are established private sector markets for both seaweed and crabs. Rather than work to establish new markets, SEEGAAD helped farmers understand their options within the current market framework. This proved to be a wise strategy under the current market situation, though should production levels or production systems change then reassessment may be necessary.
- The SEEGAAD project worked with village level MSEs, the small holder producers, who are working through strong associations to access market information from buyers.
- Completion of the mud crab value chain in 2005. The analysis mapped three distinct marketing channels for mud crab in Tanzania.
- Established mud crab cage culture trials in five coastal villages. The trials were successful and coastal villagers are now able to forecast expected sales volumes and thanks to information provided by the buyer, provide consistent quantity and quality product to the lucrative export market. By December 31, 2005, over 300 mud crabs were reared in cages and sold at an average price of \$2/kilo to the export market, generally through village traders or agents of the major exporter in Tanga, SeaProducts, Ltd. Once producers demonstrate the ability to supply consistent quality and quantity, sales prices are likely to increase and villagers will begin to able to enter into contracts with buyers.

### ***I.R.9.3. Strengthening Capacity of Small and Micro Enterprises***

- The Seaweed Development Strategic Plan (SDSP) for Tanzania was initiated by SEEGAAD staff. The document is the result of nearly two years of stakeholder fora with private sector, government, research institutions, and others who were able to outline clear development goals for the seaweed industry in Tanzania and the requirements to achieve this goal. The document was signed by the Minister of Natural Resources and Tourism and finally printed in June 2005.
- A mariculture business development module and training was provided to over 1,900 MSEs throughout the course of the project. Mariculture is a growing industry in Tanzania and the comprehensive training modules increase the chances for MSE to be profitable. Most mariculture development in Tanzania has focused on production; over time these production trials are generally not able to become viable mariculture businesses. The business development module provides a comprehensive training to guide association development and encourage those with an entrepreneurial interest to strengthen linkages to buyers and exporters so the MSEs increase their earning potential.
- Association development has been one of the key SEEGAAD project activities over the last year and nine associations have successfully been started. The legacy of cooperatives in Tanzania is such that many people are very skeptical to work in a collective manner and many coastal villagers do not fully understand how the free market economy, under which Tanzania operates today, works and how they can actively participate.
- In order to improve capacity for association development, the SEEGAAD project staff conducted a series of basic business skills trainings for villagers throughout the project areas. As a result of SEEGAAD business trainings, many mariculture producers are beginning to adopt new business practices. For example, seaweed farmers are able to calculate the return on investment for increasing yield by hiring additional laborers, and mud-crab cage culture producers are beginning to negotiate higher sales prices for export quality market crab.

- Gender mainstreaming training of trainers was conducted for SEEGAAD staff in July 2005 and a ToT was designed by the designated gender point person on the team and presented to community development officers in Pangani District.
- During the course of the project there were several capacity building opportunities for SEEGAAD staff members. Early in the program the SEEGAAD technical team traveled to Kenya for training in the Farming as a Business module that was adopted to the seaweed industry in coastal villagers and marketed as Seaweed Farming as a Business. In March 2005 the entire SEEGAAD technical team visited the National Association of Farmers (NASFAM) in Malawi, a large, successful producer association that has a very experienced training team.

## **5. PROJECT RESULTS**

The most significant success of the SEEGAAD project was the development of new mariculture activities in Tanzania such as mud crab cage culture where MSEs and business have a strong link that will last beyond the life of the project.

A second major component was linkages to the market and simple trainings on profitability analyses for various sales channels. All training was conducted in Swahili using audience appropriate training materials. The SEEGAAD project piloted several different methodologies for effectively strengthening the linkages between the smallholder producer in coastal villages, trader, buyers and exporters. Through information provided by ACIDI/VOCA volunteer consultants, local consultants and marine product exporters, additional mariculture products were identified where the link between the MSE and the exporter could be strengthened.

Training was a core activity of the SEEGAAD project. Coastal villagers made the monumental shift in describing themselves as people who sell their labor into a larger market to small-scale entrepreneurs who are able to negotiate sales prices, create simple financial plans, and produce quality product for the export markets. A complete list of training activities is listed in Appendix B.

Table 8. Summary of training activities in the Tanga and Mtwara Regions

	Village Name	Region	Number of people trained
1	Mgao	Mtwara	42
2	Mkungu	Mtwara	61
3	Naumbu	Mtwara	90
4	Pemba Pwani	Mtwara	52
5	Bagamoyo	Tanga	66
6	Boma Kichakambia	Tanga	10
7	Kijiru	Tanga	279
8	Kipumbwi	Tanga	206
9	Kiwavu	Tanga	158
#	Kwale	Tanga	93
#	Mchukuuni	Tanga	54
#	Mikocheni	Tanga	113
#	Mkwaja	Tanga	115
#	Moa	Tanga	60
#	Mondura	Tanga	23
#	Mtundani	Tanga	74
#	Putini	Tanga	50
#	Tawalani	Tanga	176
#	Tongoni	Tanga	43
#	Ushongo	Tanga	105
#	Non-village based training		27
	<b>TOTAL</b>		<b>1,897</b>

The SEEGAAD project piloted mariculture trials in mud crab cage culture, lobster shelters, deep water and raft method for seaweed farming, and introduced a simple technology for rain water harvesting and water storage. The number of participants involved in each of these activities is listed in Table 9.

Throughout the SEEGAAD project, project staff reported results on a quarterly basis to USAID using the Performance Indicator Targets Results (PITR) tables. SO9 ended on September 30, 2005 and SEEGAAD's contribution is summarized in Table 10 below. During the period of October 1-December 31, 2005, the SEEGAAD project was operating under SO12: Incomes of Small Farmers Increased in Selected Agricultural Commodity Subsectors.

The SEEGAAD project was working with 276 MSEs by the end of the first year and was able to include nearly 2,000 MSEs by the end the project. As the associations grow stronger and are able to guarantee consistent quality and quantities to buyers, they will be prepared to negotiate higher prices. The major exporters of various mariculture products are providing more market information to the producer associations about quality standards and premiums that can be paid empowering associations to choose how they want to sell their product and have a basic understanding about the resulting sales price they can expect.

Because the design of the SEEGAAD project was such that additional target products could be identified as the project rolled out, the project required an M&E system that could provide sufficient data to project staff to monitor implementation and make the necessary adjustments during the course of the project. In addition to the required USAID monitoring data, SEEGAAD staff kept a complete file from each of the target villages including field notes,

extension activities, association development activities, and other training activities.



Participants at a Business Skills Training Workshop in Mkwaja Village.  
*Photo by: Frida Urio*

Table 10. SEEGAAD Project Results

Indicator Definition	Unit	FY 03	FY 04	FY 05
		Cumulative Total	Cumulative Total	Cumulative Total
% change in number of MSEs in all program-assisted subsectors	%	276	1,506	1,947
Total number of new MSEs formed		276	1,230	441
% change in total value of program subsector sales by MSEs, facilitated by USAID-funded activities	%	5,456	285,600	397,734
Average % change in volume of sales of MSEs in program subsectors, facilitated by USAID -funded activities	Kgs	160,000	980,000	1,876,020
% change in number of USAID-program linked service providers delivering new services to MSEs in program subsectors	number	2	11	35
% change in number of MSEs accessing USAID-program facilitated training supporting services	number	N/A	952	2,321

SEEGAAD's contribution to SO12 was limited to only volume and value of production as shown below:

Table 11. SEEGAAD's contribution to SO12

Indicator Definition		Unit of measure	FY '06	FY '06	Q1 FY '06
Indicator #	IR 12.2	measure	(Baseline value)	Target	Actual
Value of marketed production by producer organizations		USD	\$397,734	\$96,000.00	\$53,000 <sup>11</sup>
Volume of marketed production by producer organizations		Tons, % change	1,876	450	352 <sup>12</sup>

<sup>11</sup> High value mud crab sales were low in FY06Q1 - much of the current stock in the cages will reach export size by Feb 2006.

<sup>12</sup> Much of the seed stock was small (less than 200 grams) and the fattening period extended from 90 days to approx. 120 days

## 6. LESSONS LEARNED

As a pilot project, SEEGAAD provided important lessons towards achieving sustainable economic growth for rural smallholders in the coastal regions of Tanzania. The various activities implemented under the project have fostered a successful development model that can be replicated and scaled up to achieve targeted results at a greater scale. The following are the primary lessons learned in implementation of the SEEGAAD project:

### ***1. Sustainable economic growth for smallholders in Tanzania’s rural coastal regions is an achievable goal.***

- The SEEGAAD project demonstrated with measurable results that rural coastal communities in Tanzania are willing and able to learn and adopt new activities as a means of increasing their incomes.
- Livelihood activities that are part of coastal conservation programs must have a strong business orientation to be successful.
- SEEGAAD emphasized on sustainability of support activities by reducing subsidies and creating market based incentives, a strategy that has paid off.
- Through SEEGAAD, it was proven that income generating activities can be done in a manner that encourages communities to protect their natural resources while enabling them to make great strides in economic development.
- As a result of the effective knowledge transfer facilitated by the SEEGAAD project in collaboration with partners such as TCZCDP, many villagers are especially knowledgeable about the benefits of sound resource management and environmental conservation.
- The SEEGAAD project was successful in filling the gap between coastal conservation activities and sustainable alternative income generating activities, an outcome that had positive impacts not only on the smallholders but also on other stakeholders including exporters and business service providers.
- Communities in the targeted coastal villages now have the skills to engage in environmentally sound mariculture activities, and these skills can be applied to the numerous income generating activities managed by most coastal households.
- As the producer associations established gain more experience and are able to demonstrate tangible benefits for the members, the coastal entrepreneurs will better link to other actors in the value chain

### ***2. Diversification of income generating activities is key in achieving sustainable income generation***

- Opportunities for diversification exists and should be pursued—it’s a learning process and trials should always be encouraged and supported at all levels
- Risk reduction and opportunities for entry into high value markets are motivating factors for diversification
- Complementarity of activities is key to maximize returns on investments both financial and environmental- communities doing seaweed farming need complementary activities

**3. A strong business orientation is an important prerequisite for successful livelihood and conservation support activities**

- Improving business skills for smallholder strengthens their ability to participate in trade effectively
- Training producers to value end market requirements
- Even the enabling environment can be improved as a way of increasing profits at all levels of the industry—even government has an incentive
- Importance of the VCA in enabling industry players to define a strategy for increasing competitiveness
- Comparative advantage is one thing and achieving a competitive advantage is another

**4. Association development is a critical component for meaningful economic development of smallholder producers in Tanzania**

- Business-oriented association development matches the Government of Tanzania's Development Vision for 2025 and the UN Millennium Development Goals for 2015 as stated in the 2005 Poverty and Human Development Report for Tanzania:

*“Associations of producers can play a critical role in safeguarding the interests of smallholders and they can also ensure a steady supply of produce for processing and marketing. Investment in co-operative producers' associations can be encouraged so that vertically integrated enterprises of production, processing and marketing add value to members' produce. The democratic development of such associations needs to be promoted.” (PHDR, 2005, pg. 94)*

- Sustainable, environmentally sound programming activities must link directly to the strategic framework for development in Tanzania, emphasizing the need for strong economic development programs that include large numbers of smallholders working as associations, a central focus of both the SEEGAAD project and ACDI/VOCA worldwide.

**5. Intersectoral coordination is key**

- Importance of bringing together private sector and public sector interests to address critical issues facing the mariculture industry. These guys don't always see eye to eye but it is important that they dialogue constructively.
- Strengthening enforcement (the poison fishing and dynamite fishing issues)
- Importance of strengthening business linkages between smallholder and exporters (exporters want to work with smallholders because of nature of commodities e.g. mud crabs)

**6. Cross cutting issues such as gender integration and access to clean water play an important role**

- Effectiveness of an integrated approach addressing cross cutting issues
- Women play a vital role in community development and empowerment is critical
- Women's role as resource users/managers
- How a simple investment in the community such as the water tanks can make such a difference

**7. Building on the success of the SEEGAAD project.**

Because the SEEGAAD project was able to pilot a variety of mariculture activities, it was important for ACDI/VOCA to secure a follow-on project that would provide funds to facilitate the scaling up of these activities to other villages and strengthen the business linkages to ensure sustainability. Sustainable Environmental Management through Mariculture Activities (SEMMA) was awarded in December 2005 and is a 5-year activity funded by USAID/Tanzania's Environment and Natural Resource Management Program's SO13. The project team will continue to work with many of the same stakeholders whose dedication to the process of economic development and coastal conservation greatly contributed to the success of the SEEGAAD project.



This photograph of women seaweed farmers was the grand prize winner of the ACDI/VOCA photo contest

*Photo by: Frida Urio  
SEEGAAD Business Development Advisor and staff photographer*

## **Appendix A: References**

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## Appendix B: Summary of Training Activities

Training Activity	Description
<b>Prosperity Workshop Module 1</b>	This training was aimed at imparting an entrepreneurial spirit among participants and encouraging the participants to take up seaweed farming as an income generating activity.
Dates	16 - 26 June 2003
Number of participants	158
Outcome	The course enabled the participants to have a creative thinking, self reflection, analysis and evaluation of their activities in general.
<b>Prosperity Workshop Module 2</b>	This aimed at planning for seaweed as a business where participants were provided with basic business planning skills i.e. combined both technical business planning lessons / topics and motivational and inspirational sessions
Dates:	13-28 August, 2003
Number of participants	133
Outcome	At the end of the module, participants were aware of how to develop their seaweed biz financial plans, identify human resources needed in their seaweed farming, listing down all activities involved in establishing a seaweed farm and developing a simple cash flow statement of their biz.
<b>Prosperity Workshop Module 3</b>	This module was aimed at helping participants to identify and plan for other income generating activities and possibilities as seaweed is a part time activity.
Dates:	23 Sept - 1 Oct 2003
Number of participants	129
Outcome	At the end of this module, all participating individuals identified at least one or two income generating activities that they will develop as a way of engaging other non-working family members also as a way of reducing pressure on expected seaweed income.
<b>Seaweed Farming As A Business</b>	The training was aimed at enabling farmers to farm seaweed in a business manner including the economics of seaweed farming, farm expansion and basics of business book keeping.
Dates:	26 July,-7 Sept 2004
Number of participants	245
Outcome	At the end of the training, farmers were able to expand their farms in a rotational manner thus enabling them to have seaweed throughout a given period which is conducive for the plants. Also they were aware of recommended production techniques.
<b>Business skills Practical Part I</b>	The course aimed at creating awareness to the participants on entrepreneurial skills, management of business funds, and importance of seaweed farming and fishing as important IGAs.
Dates:	6 April - 19 May, 2005
Number of participants	650
Outcome	The participants were able to practice acquired entrepreneurship skills; practice management of business funds; the importance of regarding seaweed farming and fishing as important IGAs; and importance of establishment and strengthening of economic groups
<b>Business skills Practical Part II</b>	The training aimed at creating awareness to participants on the whole concept of entrepreneurship - types, who an entrepreneur is, characteristics of successful entrepreneur, entrepreneur in relation to gender and possibilities of entrepreneurship in their areas.
Dates:	21 May - 1 July 2005
Number of participants	700

Outcome	The participants were able to understand the whole concept of entrepreneurship and to practice it where possible. They were emphasized on the importance of using the concept of anything done to be regarded as a biz.
<b>Associations Sensitization</b>	The training aimed at creating awareness on the free market economic system, role of the government and private sector and commercially viable solution to solve the problem.
Dates:	5-Dec
Number of participants	425
Outcome?	One of the suggested solutions is the establishment of associations.
Association Development	The training outlined the whole process of association formation, election of leaders, preparation of constitutions and registration procedures.
Dates:	5-Dec
Number of participants	552
Outcome	A total of 9 associations were formed with leaderships and all have prepared draft constitutions.
<b>Strategic Planning for Mariculture Assoc.</b>	Enabled association members to identify their issues and solutions
Dates:	5-Dec
Number of participants	492
Outcome	Four associations out of nine conducted strategic planning and managed to prepare their draft action plans of the associations.
<b>Leadership Training for Associations</b>	Aimed at enabling participants understand their roles and responsibilities as leaders.
Dates:	22-25 Dec, 2005
Number of participants	108
Outcome	Participants understood their roles and responsibilities, characteristics of good leadership etc making therefore making them able to perform better in their daily duties.
<b>Seaweed Extension Services</b>	Use of drying racks, post-harvest handling, etc.
Dates:	throughout the SEEGAAD project
Number of participants	2025
Outcome	Increased use of drying racks, improved quality of seaweed - free from any contamination
<b>Seaweed farm demonstration sites - deep water and raft trials</b>	Aimed at enlightening farmers on other methods of seaweed farming
Dates:	throughout the SEEGAAD Project
Number of participants	70
Outcome	Rafts resulted into higher yields as compared to other methods. Deep water proved success in Tawalani village for sometimes, in other areas it could not succeed due to unfavorable environmental conditions. Generally this method is recommended to be a used seasonal when there are moderate conditions.
<b>Lobster shelters demo design</b>	The training was aimed at on how to make the shelters, deploying them and monitoring the results, and was more focused on the practical part.
Dates:	January, 2005
Number of participants	35
Outcome	The shelters were deployed and the members monitored them. In December, 2005 they started harvesting lobster and managed to harvest a total of kg 124.7 worth Tsh. 931,100/=.

<b>Crab fattening tech. Training</b>	The training aimed at enabling farmers to select sites, construct cages, collection of juvenile crab, handling, feeding regimes and types of feeds; problem identification (diseases & mortalities);
Dates:	25-29 May, 2005
Number of participants	66
Outcome	Farmers were able to identify suitable sites, cage construction, searching for juvenile crab, understand various types of feeds, ways to solve problems including early warning.
<b>Crab fattening -market linkages</b>	Identification of reliable buyers and how to access the markets was the main aim of the training. The whole marketing chain was identified with the farmers and the constraints of the markets identified. The issue of quality control was also highlighted.
Dates:	25-29 May 2005
Number of participants	50
Outcome	The farmers were able to know the market chain of crabs, and identify the local buyers in their respective areas. Also they were advised on making contacts with reliable buyers like Sea Products and already some farmers are selling straight to Sea Products.

## Appendix C: Summary of Consultants

### Summary of consultants contracted throughout the SEEGAAD project

		Contact	Summary of STTA
1	PSI	Mr. George Bananuka	PSI conducted a series of Prosperity Workshops in the Tanga Region. The training was aimed at planning for seaweed as a business where participants were provided with basic business planning skills i.e. combined technical business planning lessons / topics and motivational and inspirational sessions. At the end of the module, participants were aware of how to develop their seaweed biz financial plans, identify human resources needed in their seaweed farming, listing down all activities involved in establishing a seaweed farm and developing a simple cash flow statement of their biz.
2	EDC	Mr. Mallah	EDC trainers are a product of The Business Center, a USAID-funded center that was formed in the mid-1990s. The training aimed at creating awareness to participants on the whole concept of entrepreneurship - types, who an entrepreneur is, characteristics of successful entrepreneur, entrepreneur in relation to gender and possibilities of entrepreneurship in their areas.
3	Match Maker, Ltd	Mr. Peniel Uliwa, Mr. Henri van der Laan	Conducted the Mud Crab Value Chain Analysis and also provided VCA training for two SEEGAAD staff members
4	TAFARI	Dr. Charles Mahika	Dr. Mahika and his team of scientists from TAFIRI conducted a natural stock survey in the Tanga region to assess the status of the juvenile population of mud crab and other mariculture species.
5	IMS	Dr. Aviti Mochi	The IMS team included three senior scientists, Dr. Shugude, Dr. Msuya and Dr. Mochi who conducted an analysis of several parameters in select villages in the Tanga region to determine what factors may be contributing the serious problems with die-off, especially with the higher value cottonii species.
6	Mr. Jimmy Shulte	Mr. Jimmy Shulte	Conducted a simple household income survey of villages in the SEEGAAD project area.
7	Kulaluma	Mr. Clement Komanya	Appropriate technology training – rain water harvesting jars, sand-based water filters, household water storage jars.
8	RRC Consulting	Mr. R. Mugyabusu	Leadership training for all project associations. The training included sessions on association management, group activities to identify potential problems in the association and how to manage those situations. The final activity was field visit to a successful orange growers' association in the region.

## **Appendix D. Mariculture Working Group Members**

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The Draft Mariculture Guidelines were prepared by the TCMP and Mariculture Working Group. The members of the Working Group are:

Mrs. Fatma A.S. Sobo	-	Division of Fisheries
Mr. Winfried Haule	-	Division of Fisheries
Mr. Sadock Kimaro	-	Division of Fisheries
Mrs. Ritha Maly	-	Division of Fisheries
Dr. Yunus Mgaya	-	Zoology and Marine Biology – UDSM
Mr. Mathew Mwanuo	-	Forestry/Mangrove Management Project
Mr. Hassani Mhitu	-	Tanzania Fisheries Research Institute
Mr. Baraka Kalangahe	-	SEEGAAD Project/TCMP
Mr. Danford Mwaipopo	-	National Environment Management Council
Mr. Jairos Mahenge	-	Buyuni Company Ltd.
Mr. Raphael Lema	-	Fisheries Officer (Retired)
Mr. Faustin Masanja	-	Water Resources Department
Mrs. Suma Mbyopyo	-	Lands and Human Settlement
Mr. Lugazo Zuberi	-	SEEGAAD Project.
Mr. A. Shao	-	Tanzania Investment Center
Dr. Maria Haws	-	University of Rhode Island- Coastal Resources Center
Mr. M. Amaral	-	University of Rhode Island- Coastal Resources Center
Mr. J.M. Daffa	-	TCMP
Mr. G. Mwamsojo	-	National Environment Management Council

## Appendix E: Mud Crab Value Chain Map

