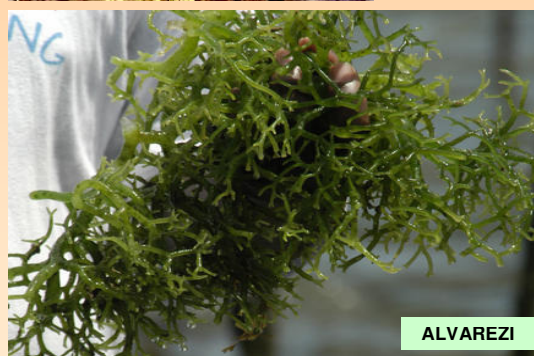


COSTS & RETURNS_{OF}



SEAWEED Production

JANUARY 2009



DEPARTMENT OF AGRICULTURE
**BUREAU OF AGRICULTURAL
STATISTICS**

FOREWORD

This report presents the results of the Survey of the Costs and Returns in Seaweed Production conducted by the Bureau of Agricultural Statistics (BAS) in March 2008. The survey was conducted in the five (5) major seaweeds producing provinces of Palawan, Bohol, Zamboanga Sibugay, Maguindanao and Tawi-Tawi.

In addition to the data on costs and returns, this report presents the other socio-economic variables related to seaweed production. The reference period of the survey is the last completed production cycle in 2007.

This Costs and Returns Survey was conducted by the BAS to fulfill its commitments to provide socio-economic information that enhance farm profitability and income diversification.

As in other BAS publications, we welcome comments and suggestions from data users and researchers for the improvement of our statistical products.

ROMEO S. RECIDÉ
Director

TABLE OF CONTENTS

	<u>Page</u>
FOREWORD	i
TABLE OF CONTENTS	ii
LIST OF TABLES	iv
LIST OF FIGURES	viii
EXPLANATORY NOTES	xi
SUMMARY OF FINDINGS	xii
INTRODUCTION	1
OBJECTIVES	2
METHODOLOGY	2
SURVEY RESULTS	5
Characteristics of Seaweed Farm Operators	5
Sex, Age, Educational Attainment and Farming Experience	
Main Occupation	
Characteristics of Seaweed Farms	6
Average Number of Farms Per Farm Operator, Farm Size and	
Area of Focus Farms	
Area Harvested by Variety Planted	
Farm Investments	

	<u>Page</u>
Farm Practices and Input Usage	7
Number of Croppings	
Seaweed Farm Operators by Variety Planted	
Seaweed Farm Operators by Culture Method	
Seaweed Farm Operators by Source of Seedlings	
Month of Planting and Harvesting	
Seaweed Farm Operators who Dried their Produce	
Input Usage	
Seedlings	
Labor	
Average Costs and Returns of Producing Seaweeds	11
All 5 Provinces	
Palawan	
Bohol	
Zamboanga Sibugay	
Maguindanao	
Tawi-Tawi	
Inter-provincial Comparisons	
Other Information	16
Disposition of Produce	
Major Buyers of Produce	
Production - related Problems	
Marketing - related Problems	
Access to Credit	
Source of Loans	
Amount of Loan Availed	
Interest Rate	
Membership to Seaweed related Association	
Benefits Received from Seaweed related Association	
Access to Extension Services	
Services Availed from Extension Agents	
Plans of Seaweed Farm Operators	
Recommendations for Further Improvement of Seaweed Production	
STATISTICAL TABLES	22

LIST OF TABLES

<u>Table No.</u>	<u>Title</u>	<u>Page</u>
1	Percentage distribution of seaweed farm operators by sex, selected provinces, Philippines, 2007	23
2	Average age of seaweed farm operators and percentage distribution by age group, selected provinces, Philippines, 2007	24
3	Percentage distribution of seaweed farm operators by educational attainment, selected provinces, Philippines, 2007	25
4	Average farming experience of seaweed farm operators and percentage distribution by number of years engaged in seaweed production, selected provinces, Philippines, 2007	26
5	Percentage distribution of seaweed farm operators by main occupation, selected provinces, Philippines, 2007	27
6	Average number of farms per farm operator, average farm size and area of focus farm, selected provinces, Philippines, 2007	28
7	Average area harvested of seaweed focus farms by variety planted, selected provinces, Philippines, 2007	29
8	Percentage of farmers reporting by type of investment used in seaweed production, selected provinces, Philippines, 2007	30
9	Percentage distribution of seaweed farm operators by number of croppings per year, selected provinces, Philippines, 2007	31
10	Percentage distribution of seaweed farm operators by variety planted, selected provinces, Philippines, 2007	32
11	Percentage distribution of seaweed farm operators by culture method, selected provinces, Philippines, 2007	33
12	Percentage of seaweed farm operators reporting on the source of seedlings, selected provinces, Philippines, 2007	34
13	Percentage distribution of seaweed farm operators by month of planting, selected provinces, Philippines, 2007	35

<u>Table No.</u>	<u>Title</u>	<u>Page</u>
14	Percentage distribution of seaweed farm operators by month of harvesting, selected provinces, Philippines, 2007	36
15	Percentage of seaweed farm operators who dried their produce, selected provinces, Philippines, 2007	37
16	Average quantity of seedlings used by source, selected provinces, Philippines, 2007	38
17	Average labor utilization for seaweed production, by source of labor and sex, selected provinces, Philippines, 2007	39
18	Average labor utilization for seaweed production per hectare, by farm activity and sex, selected provinces, Philippines, 2007	40
19	Average costs and returns of seaweed production, All 5 Provinces, 2007	41
20	Average variable and fixed costs of seaweed production, All 5 Provinces, 2007	42
21	Average costs and returns of seaweed production, Palawan, 2007	43
22	Average variable and fixed costs of seaweed production, Palawan, 2007	44
23	Average costs and returns of seaweed production, Bohol, 2007	45
24	Average variable and fixed costs of seaweed production, Bohol, 2007	46
25	Average costs and returns of seaweed production, Zamboanga Sibugay, 2007	47
26	Average variable and fixed costs of seaweed production, Zamboanga Sibugay, 2007	48
27	Average costs and returns of seaweed production, Maguindanao, 2007	49
28	Average variable and fixed costs of seaweed production, Maguindanao, 2007	50

<u>Table No.</u>	<u>Title</u>	<u>Page</u>
29	Average costs and returns of seaweed production, Tawi-Tawi, 2007	51
30	Average variable and fixed costs of seaweed production, Tawi-Tawi, 2007	52
31	Average costs and returns of seaweed production per hectare by major cost item, selected provinces, Philippines, 2007	53
32	Percentage distribution of seaweed produce by disposition item, selected provinces, Philippines, 2007	54
33	Percentage distribution of seaweed farm operators reporting on major buyers of produce, selected provinces, Philippines, 2007	55
34	Percentage of seaweed farm operators reporting problems on production, selected provinces, Philippines, 2007	56
35	Percentage of seaweed farm operators reporting problems on marketing, selected provinces, Philippines, 2007	57
36	Percentage of seaweed farm operators who availed loans for seaweed production, selected provinces, Philippines, 2007	58
37	Percentage distribution of seaweed farm operators who availed loans by source, selected provinces, Philippines, 2007	59
38	Percentage distribution of seaweed farm operators who availed loans by amount borrowed, selected provinces, Philippines, 2007	60
39	Percentage distribution of seaweed farm operators who availed loans by interest rate, selected provinces, Philippines, 2007	61
40	Percentage of seaweed farm operators who are members of seaweed related associations, selected provinces, Philippines, 2007	62
41	Percentage of seaweed farm operators reporting on the benefits received from seaweed related association, selected provinces, Philippines, 2007	63
42	Percentage of seaweed farm operators who consulted/used advice of extension agents, selected provinces, Philippines, 2007	64

<u>Table No.</u>	<u>Title</u>	<u>Page</u>
43	Percentage of seaweed farm operators reporting on the services availed from extension agents, selected provinces, Philippines, 2007	65
44	Percentage of seaweed farm operators reporting on the plan of operation, selected provinces, Philippines, 2007	66
45	Percentage of seaweed farm operators reporting on the recommendations to further improve the seaweed industry, selected provinces, Philippines, 2007	67

LIST OF FIGURES

<u>Figure No.</u>	<u>Title</u>	<u>Page</u>
1	Percentage distribution of seaweed farm operators by sex	5
2	Average age of seaweed farm operators	5
3	Percentage distribution of seaweed farm operators by educational attainment	5
4	Average farming experience of seaweed farm operators	5
5	Average area of seaweed farms	6
6	Average area harvested of seaweed focus farms by variety planted	6
7	Percentage distribution of seaweed farm operators by number of croppings per year	7
8	Percentage distribution of seaweed farm operators by variety planted	8
9	Percentage distribution of seaweed farm operators by culture method	8
10	Percentage of seaweed farm operators by source of seedlings	8
11	Percentage distribution of seaweed farm operators by month of planting	9
12	Percentage distribution of seaweed farm operators by month of harvesting	9
13	Percentage of seaweed farm operators who dried seaweeds	10
14	Average quantity of seedlings used per hectare	10
15	Average labor utilization per hectare	10
16	Average labor utilization per hectare by farm activity	11

<u>Figure No.</u>	<u>Title</u>	<u>Page</u>
17	Average costs and returns of seaweed production, All 5 Provinces	11
18	Percentage distribution of costs of seaweed production, All 5 Provinces	11
19	Average costs and returns of seaweed production in Palawan	12
20	Percentage distribution of costs of seaweed production in Palawan	12
21	Average costs and returns of seaweed production in Bohol	13
22	Percentage distribution of costs of seaweed production in Bohol	13
23	Average costs and returns of seaweed production in Zamboanga Sibugay	13
24	Percentage distribution of costs of seaweed production in Zamboanga Sibugay, 2007	14
25	Average costs and returns of seaweed production in Maguindanao	14
26	Percentage distribution of costs of seaweed production in Maguindanao	14
27	Average costs and returns of seaweed production in Tawi-Tawi	15
28	Percentage distribution of costs of seaweed production in Tawi-Tawi	15
29.a	Average production of seaweeds per hectare	15
29.b	Average costs and gross returns per hectare	15
29.c	Net Profit - Cost Ratios of producing seaweeds	16
30	Percentage distribution of seaweed farm operators reporting on major buyers of produce	16
31	Percentage of seaweed farm operators reporting problems on production	17

<u>Figure No.</u>	<u>Title</u>	<u>Page</u>
32	Percentage of seaweed farm operators reporting problems on marketing	17
33	Percentage of seaweed farm operators who availed loans for seaweed production	18
34	Percentage distribution of seaweed farm operators who availed loans by source	18
35	Percentage distribution of seaweed farm operators who availed loans by amount borrowed	18
36	Percentage of seaweed farm operators who are members of seaweed related associations	19
37	Percentage of seaweed farm operators by benefit received from seaweed related associations	19
38	Percentage of seaweed farm operators who consulted/used advice of extension agents	20
39	Percentage of seaweed farm operators reporting on the services availed from extension agents	20
40	Percentage of seaweed farm operators reporting on the plan of operation	20
41	Percentage of seaweed farm operators reporting on the recommendations to further improve the seaweed industry	21

EXPLANATORY NOTES

1. Focus farm refers to the seaweed farm where the last cropping is completed. However, if operation in the farm is staggered, focus area becomes the particular part of the focus farm where last cropping is completed.
2. Average costs and returns of seaweed production were computed and presented as follows:

$$\text{Per hectare} = \frac{\text{Total value of input (or output)}}{\text{Total harvest area}}$$

$$\text{Per farm} = \frac{\text{Total value of input (or output)}}{\text{Total number of farms}}$$

$$\text{Per kilogram} = \frac{\text{Total value of input (or output)}}{\text{Total production}}$$

3. The average of production costs and returns represented the consolidated data of the five (5) provinces covered in the study.
4. Data may not add up to respective totals due to rounding off.
5. Blank cells in the statistical tables indicate that there was no report for a particular data item.

SUMMARY OF FINDINGS

- ❑ Across the five (5) provinces, 91.9 percent of seaweed farm operators were males. Seaweed farm operators had an average age of 42 years with 9 years of experience in seaweed production.
- ❑ Most seaweed farm operators had formal schooling. Only 3 percent had no schooling at all. In Tawi-Tawi, 100 percent of seaweed farm operators had formal education.
- ❑ The main occupation of 80.7 percent of seaweed farm operators was under farming, forestry and fishing. Of which, 94.6 percent were engaged in seaweed production.
- ❑ The average size of seaweed farms was 0.48 hectare while the average size of focus farm was 0.33 hectare.
- ❑ By variety, average areas harvested were 0.35 hectare for cottonii, 0.37 hectare for alvarezii and 0.09 hectare for spinosum.
- ❑ Some 33.8 percent of seaweed farm operators practiced three (3) croppings per year. About 21 percent each of farm operators practiced one (1) and two (2) croppings. The remainder had more than three (3) croppings per year.
- ❑ Majority or 85.1 percent of seaweed farm operators in the provinces surveyed planted Cottonii variety.
- ❑ About 69.6 percent of the seaweed farm operators practiced monoline floating method and 28.4 percent were adopting the monoline bottom method. The rest used the triangular method of planting.
- ❑ Average quantity of planting materials used in seaweed focus farms was 4,814 kilograms per hectare. About 58.4 percent of the planting materials were produced by the farmers themselves.
- ❑ Average labor requirement in seaweed production was 101.5 mandays per hectare. Hired workers provided 26 percent of the total labor inputs. Farm operator and family members contributed 44.5 percent and 29.1 percent to total labor requirements, respectively.

- ❑ Production of seaweed in Palawan averaged 39,387 kilograms per hectare. Gross earnings amounted to P208,374 per hectare while average cost of production was estimated at P69,109. Net returns averaged P139,265 per hectare. Farmer operators netted P2.02 for every peso of investment.
- ❑ Average variable costs of production amounted to P61,855 per hectare or 89.5 percent of all costs. On per kilogram basis, cost of production was P1.75.
- ❑ In Bohol, seaweed production averaged 33,988 kilograms per hectare. It entailed an average cost of P64,915 or P1.91 per kilogram. Gross returns amounted to P131,354 per hectare and net returns averaged P66,439 per hectare. Net profit stood at P1.02 for every peso of investment.
- ❑ Variable costs of seaweed production averaged P54,364 per hectare or 83.8 percent of all costs. Fixed costs averaged P10, 551 per hectare.
- ❑ Average production of seaweed in Zamboanga Sibugay was estimated at 19,812 kilograms valued at P86,140 per hectare. Average cost of production amounted to P28,832 per hectare. Net returns averaged P57,307 per hectare. Net profit-cost ratio was recorded at 1.99.
- ❑ Average variable costs were estimated at P26,737 per hectare or 92.7 percent of all costs. On per kilogram basis, cost of production was P1.46.
- ❑ Production of seaweed in Maguindanao averaged 20,180 kilograms per hectare and entailed an average cost of P38,085. Seaweed farm operators grossed P60,540 per hectare and netted P22,455 per hectare. Net profit-cost ratio was computed at 0.59.
- ❑ Variable costs of seaweed production averaged P33,740 per hectare or 88.6 percent of all costs. Fixed costs averaged P4,345 per hectare. On per kilogram basis, cost of production was P1.89.
- ❑ Average cost of producing seaweed in Tawi-Tawi was estimated at P79,031 per hectare. With an average yield of 58,231 kilograms per hectare, seaweed farm operators grossed P255,723 and netted P176,692 per hectare. This translated to a net profit of P2.24 for every peso of investment.
- ❑ Average variable costs of producing seaweed were estimated at P65,765 per hectare or 83.2 percent of all costs. Fixed costs averaged P13,266 per hectare. On per kilogram basis, cost of production was P1.36.

- ❑ The bulk or 94.2 percent of total seaweed production were sold. About 5.5 percent were set aside for seedling purposes.
- ❑ Assemblers and wholesalers were the major buyers of produce as reported by 41.2 percent and 38.2 percent of seaweed farm operators, respectively.
- ❑ Diseases like ice-ice, epiphytes, etc., bad weather conditions and lack of capital were the major problems cited by seaweed farm operators.
- ❑ Unstable price was the major marketing-related problem cited by 61.8 percent of seaweed farmer operators. Some 58.5 percent were concerned on low price of produce.
- ❑ Only 9.8 percent of seaweed farm operators availed of loans for seaweed production. Most of the operators borrowed from private individuals and farmer associations.
- ❑ About 24.3 percent of farm operators were members of seaweed related associations. Of the total members, 31.9 percent received financial assistance for material inputs and supplies. Some 13.9 percent received technical assistance while 11.1 percent were benefited from seedlings dispersal.
- ❑ The number of seaweed farm operators who consulted and used advice of government extension agents are relatively higher compared to the number of seaweed operators who consulted/used advice of private extension agents.
- ❑ There were 53.7 percent of seaweed farm operators who will maintain their current level of operations. Some 41.6 percent will expand their seaweed operation.
- ❑ The major recommendations of seaweed farm operators to further improve the production of seaweed were provision of financial assistance, seaweed facilities and supplies and technical assistance.

COSTS AND RETURNS OF SEAWEED PRODUCTION

INTRODUCTION

Seaweeds are marine plants or alga. They are macroscopic and multi-cellular algae. There are many different varieties of seaweeds in the Philippines but the major varieties are Eucheuma (Arnoldii, Denticulatum or Spinosum and Gelatinae), Kappaphycus (such as Alvarezii and Cottonii), Gracilaria, Caulerpa, Codium, Gelidiella acerosa, Halymenia, Porphyra and Sargassum spp.

Seaweed has become one of the most promising commodities in the country because of its wide industrial and commercial uses. Aside from being a human food, animal feeds and fertilizers, seaweed is a good source of carageenan, agar and alginate. Carageenans are widely used in food and other industries as thickening and stabilizing agents. Agar is gelatinous substance chiefly used as a solid substrate for containing culture medium for microbial work. It is also used as laxative, vegetarian gelatin substitute, thickener for soups, in jellies, ice cream and clarifying agent in brewing. Alginates, on the other hand, are made of soft non-woven fibers which are usually in the form of pads, ropes or ribbons that are used mainly in biomedicine for wound dressing and dental wounds. Alginates are also used in the production of paper coatings, adhesives, dyes, gel, explosives, paper sizing, textile painting, hydro mulching and drilling.

Production of seaweeds in the Philippines has been going up remarkably. From 785.8 thousand metric tons in 2001, production went up to 1,505 thousand metric tons in 2007. It posted an average growth of 11.4 percent annually. In 2007, seaweeds shared 68 percent in total aquaculture production.

Seaweed is one of the major contributors to foreign currency earnings. In 2006, seaweed exports valued at P3.6 billion, accounted for 16 percent of the total fishery exports.

In terms of employment, seaweed culture requires more labor inputs. Thus, it offers more employment opportunities than other fishery activities especially for those idle labor forces in the coastal areas.

Due to the large potentials of seaweeds, it has become necessary to ascertain the profitability of venturing into the production of this commodity. Its large contribution to the overall fishery subsector has also made it one of the top priorities for development. The Costs and Returns Survey of Seaweed Production was, thus, conducted to generate the needed information for promoting the sustained expansion of the seaweed industry in the Philippines.

OBJECTIVES

The main objective of this study is to generate the current production costs and returns structure of seaweeds.

Specifically, it aims to generate:

- production cost structures;
- indicators of profitability such as gross and net returns, returns above cash costs, net profit - cost ratio, etc.;
- information on average use of materials and labor inputs; and
- other related socio-economic variables including information on new production technologies.

REFERENCE PERIOD

The reference period of the Costs and Returns Survey of Seaweed Production was the last production cycle completed in 2007.

METHODOLOGY

Coverage

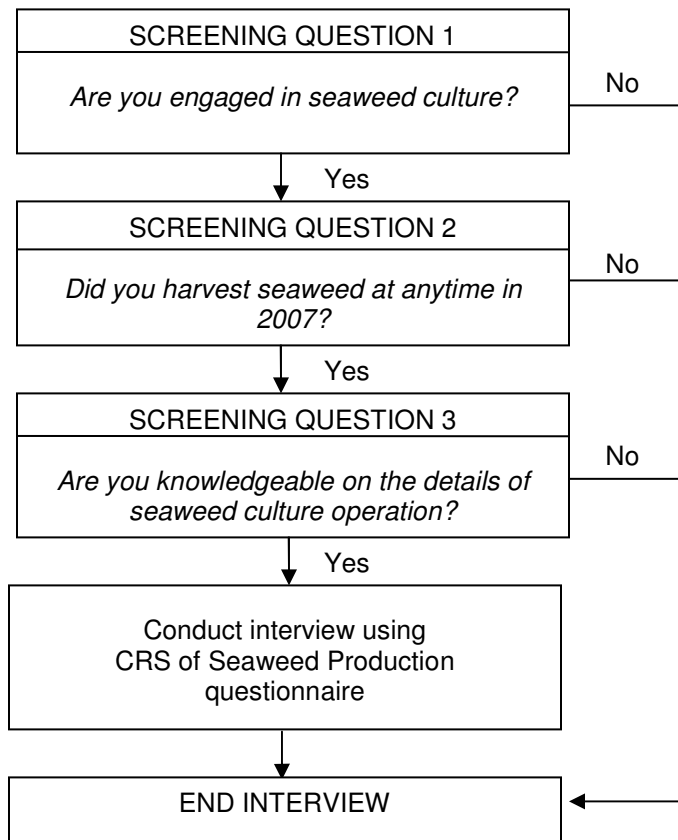
The survey was conducted in five (5) provinces, namely; Palawan, Bohol, Zamboanga Sibugay, Maguindanao and Tawi-Tawi. Each province was chosen to represent the top seaweed producing regions. The domain of the survey was the province. Seaweed farm operators from the said provinces who harvested seaweeds during the reference period were the target samples for the survey. The sample seaweed farm operators were interviewed on the details of seaweed culture and costs of production.

Sampling Design, Sample Size and Sample Selection Procedure

A two-stage sampling design was employed with the barangay as the primary sampling unit and seaweed farm operator as the secondary sampling unit. The list of seaweed producing barangays which was generated through the Aquaculture Farms Inventory was used as the sampling frame. The sample barangays were drawn using simple random sampling from the list of barangays with at least 90 percent cumulative share of seaweed harvested area and with more than five seaweed operators. Ten (10) barangays were drawn from each province except for Maguindanao, which has less than ten seaweed producing barangays. In this case, all barangays were covered by the survey.

The number of sample seaweed operators was proportionately allocated to the number of operators in the sample barangay. In each sample barangay, sample seaweed farm operators were identified using snowball sampling¹. Names and addresses of seaweed operators living in the barangay were obtained from the barangay council or from seaweed farmers association. From this list, the enumerator selected a seaweed farm operator at random. A set of screening questions was asked from the operator to determine if he/she met the criteria set for the survey. Whether the operator was qualified or not, he/she would then be asked to recommend others who they thought could qualify as survey respondents. From these names, the enumerator again selected a seaweed farm operator as the second potential sample for the survey. The process continued until the required number of samples was attained.

In selecting the qualified sample respondents, the following Screening Questions were asked:



¹ Snowball sampling is useful when a researcher tries to reach populations that are inaccessible or hard to find. It is a special non-probability method used when the desired sample characteristic is rare. It may be extremely difficult or cost prohibitive to locate respondents in these situations. For purposes of this survey, the criteria for selection of seaweed operators make it difficult to find qualified respondents, although they tend to cluster in certain areas. Snowball sampling relies on referrals from initial subjects to generate additional subjects.

Using the above-cited procedures, the survey was able to enumerate the following sample seaweed farm operators by province and variety planted.

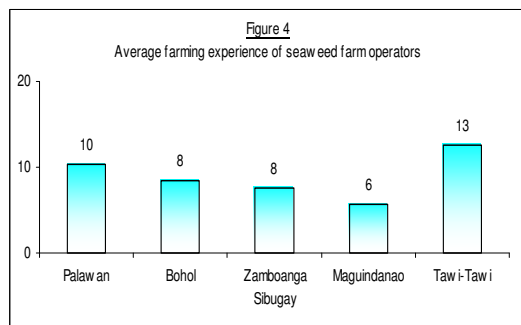
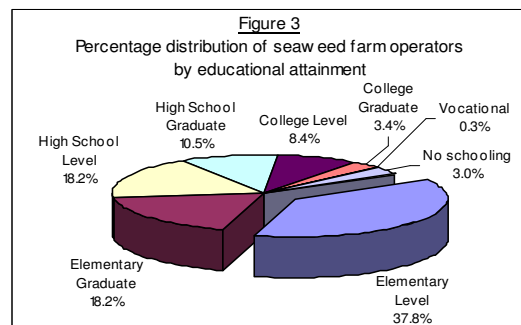
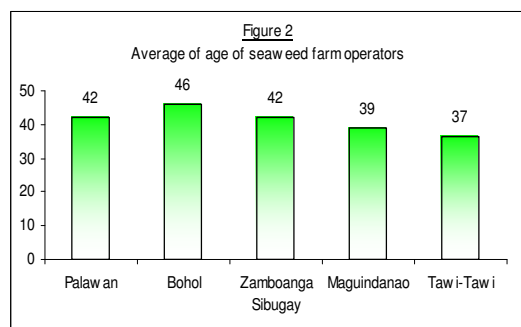
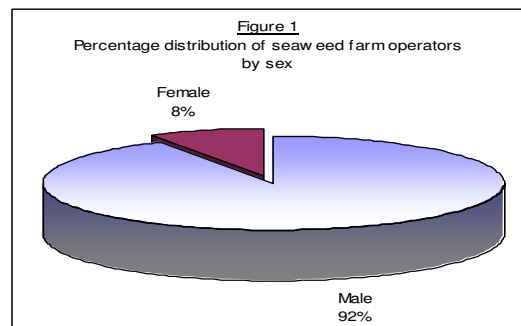
PROVINCE	VARIETY			TOTAL
	COTTONII	ALVAREZII	SPINOSUM	
Palawan	71			71
Bohol	51		24	75
Zamboanga Sibugay	30	20		50
Maguindanao	50			50
Tawi-Tawi	49	1		50

SURVEY RESULTS

Characteristics of Seaweed Farm Operators (Tables 1 - 5)

Sex, Age, Educational Attainment and Farming Experience

- Most seaweed farm operators were males. They ranged from 82 percent in Zamboanga Sibugay to 100 percent in Maguindanao.
- Ages of seaweed farm operators averaged 46 years in Bohol, 42 years in Palawan and Zamboanga Sibugay, 39 years in Maguindanao and 37 years in Tawi-Tawi. By age group, more than half of the seaweed farm operators belonged to 31- 40 and 41 - 50 age groups.
- Many seaweed farm operators had formal schooling. About 38 percent reached elementary level. The proportion of seaweed farm operators who finished elementary was highest in Maguindanao at 36 percent. In Tawi-Tawi, 38 percent finished high school and 22 percent reached college.
- Seaweed farm operators in Maguindanao had six (6) years of experience in seaweed production. Those in Bohol and Zamboanga Sibugay had eight (8) years. Farm operators in Palawan had 10 years and those in Tawi-Tawi had 13 years of experience.
- By number of years engaged in seaweed production, majority or 98 percent of the seaweed farm operators in Maguindanao had below 11 years of experience. In Tawi-Tawi, 36 percent had 11-20 years of experience. Across provinces, majority or more than 50 percent of the seaweed farm operators had less than 11 years of experience.



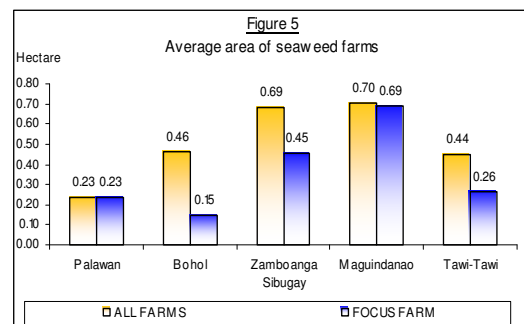
Main Occupation

- Most seaweed farm operators reported that their main occupation was under farming, forestry and fishing. These were reported by 62 percent of farm operators in Palawan, 75 percent in Bohol, 88 percent in Zamboanga Sibugay, 100 percent in Maguindanao and 90 percent in Tawi-Tawi. Those engaged mainly in seaweed culture were 100 percent in Palawan and Bohol, 96 percent in Maguindanao, 98 percent in Tawi-Tawi, and 77 percent in Zamboanga Sibugay.
- Seaweed farm operators reporting other types of occupation ranged from 1.3 percent in Bohol to 38 percent in Palawan.

Characteristics of Seaweed Farms (Tables 6 - 8)

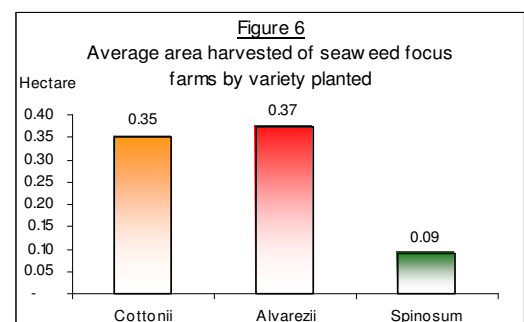
Average Number of Farms Per Operator, Farm Size and Area of Focus Farm

- Average number of seaweed farms per operator across provinces was 1.48. The highest was reported in Tawi-Tawi at 1.62 and the least was in Maguindanao at 1.30.
- Average size of seaweed farm was biggest in Maguindanao at 0.70 hectare. Those in Zamboanga Sibugay followed at 0.69 hectare. Average farm sizes in Bohol and Tawi-Tawi were almost the same at 0.46 and 0.44 hectare, respectively. The least size was noted in Palawan at 0.23 hectare.
- Average size of focus farm (area planted with seaweed) was 0.33 hectare. The biggest size of focus farm at 0.69 hectare was located in Maguindanao. The smallest was in Bohol at 0.15 hectare.



Area Harvested by Variety

- In all five (5) provinces, average area harvested to Alvarezii was 0.37 hectare. Average area harvested in Cottonii was 0.35 hectare. The smallest average area at 0.09 hectare was recorded for Spinosum.
- For Cottonii, biggest area harvested was in Maguindanao at 0.69 hectare. The smallest was in Bohol at 0.18 hectare.



- Area harvested to *Alvarezii* averaged 0.38 hectare in Zamboanga Sibugay and 0.26 hectare in Tawi-Tawi.
- Area harvested to *Spinosum* averaged 0.09 hectare in Bohol.

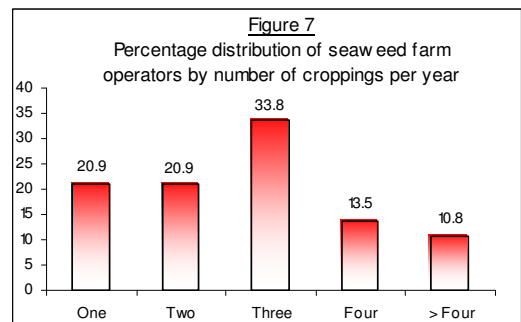
Farm Investments

- In all the five (5) provinces, majority or 92.2 percent of seaweed farm operators had boat and 19.9 percent had engine.
- About 12.5 percent of farmer operators had farmhouse, 27.4 percent had drying platform and 10.5 percent had storage of supplies and dried seaweeds (bodega).
- Those operators invested in bolo/knife and paddle were 95.3 percent and 71 percent, respectively.
- Investments in pole, mesh net, polyethylene rope, goggles/snorkeling mask, and basket were reported by 42.6 percent to 50 percent of farm operators.

Farm Practices and Input Usage (Tables 9 - 18)

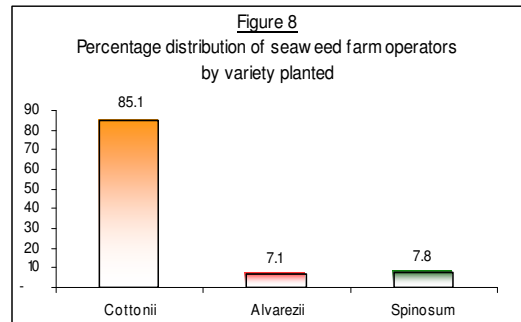
Number of Croppings

- Across provinces, most farm operators had three (3) croppings per year. This was practiced by 72 percent of operators in Maguindanao, by at least 36 percent each of operators in Palawan and Zamboanga Sibugay, 26 percent in Tawi-Tawi and 9.3 percent in Bohol.
- More than 35 percent of seaweed farm operators in Palawan practiced one (1) cropping per year.
- In Bohol, 32 percent of the seaweed farm operators practiced two (2) croppings per year while 28 percent practiced more than four (4) croppings.



Seaweed Farm Operators by Variety Planted

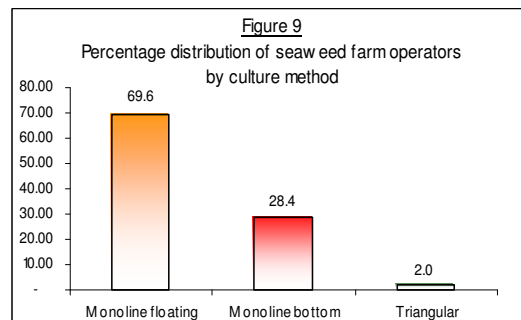
- Among provinces, majority or 85.1 percent of seaweed farm operators planted Cottonii variety.
- All seaweed farm operators in Palawan and Maguindanao planted Cottonii variety. In Bohol, 69 percent of farm operators planted Cottonii and 31 percent planted Spinosum.



- About 40 percent of farm operators in Zamboanga Sibugay planted Alvarezii while 60 percent planted Cottonii.
- In Tawi-Tawi, 98 percent of the farm operators planted Cottonii. Only 2 percent of the farm operators planted Alvarezii.

Seaweed Farm Operators by Culture Method

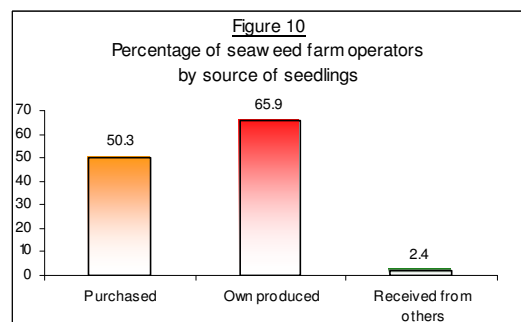
- About 69.6 percent of seaweed farm operators used the monoline floating method, 28.4 percent were into monoline bottom method while only 2 percent used triangular method.
- The monoline floating method was used by 90.1 percent of farm operators in Palawan, 96 percent in Zamboanga Sibugay, and all farm operators in Maguindanao.



- In Bohol and Tawi-Tawi, 65.3 percent and 62 percent of farm operators utilized the monoline bottom method, respectively.

Seaweed Farm Operators by Source of Seedlings

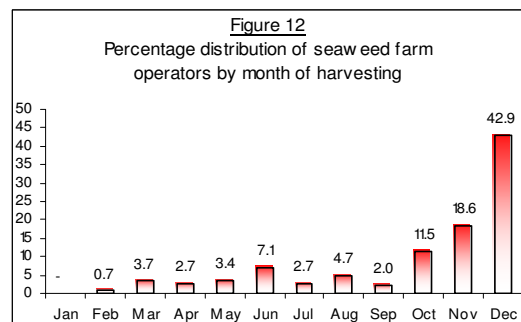
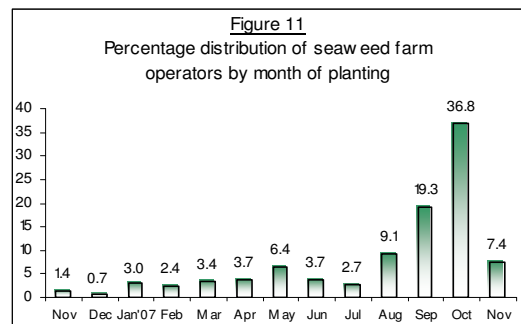
- Across the five (5) provinces, 65.9 percent of farm operators used own-produce seedlings. There were 50.3 percent who purchased seedlings and 2.4 percent used seedlings that were received from others.



- About 67.6 percent of seaweed farm operators in Palawan used their own produce as planting materials and 26.8 percent purchased their seedlings.
- Two-thirds of seaweed farm operators in Bohol used their own produce as seedlings while one-third purchased their seedlings.
- In Zamboanga Sibugay, 82 percent of farm operators purchased seedlings while 70 percent used their own produce seedlings.
- In Maguindanao, 76 percent purchased their seedlings while 78 percent used their own produce seedlings.

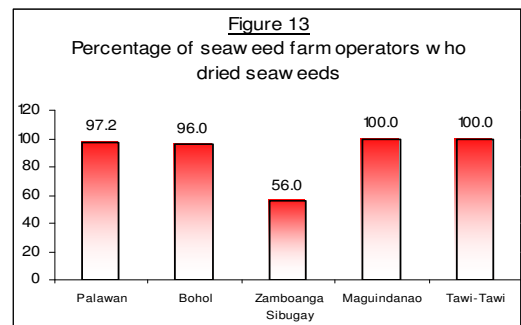
Month of Planting and Harvesting

- Across the five (5) provinces, 36.8 percent of seaweed farm operators planted in October while those who planted in September accounted for 19.3 percent.
- Some 56 percent of farmers in Maguindanao planted seaweed in October while there were 16 percent each who planted in September and November.
- Planting in October was reported by 52 percent in Tawi-Tawi, 34.7 percent in Bohol and 26 percent in Zamboanga Sibugay.
- There were 26 percent of farm operators in Tawi-Tawi and 23.9 percent in Palawan who planted seaweeds in September.
- Harvesting in December was observed by 68 percent in Maguindanao and 62 percent in Tawi-Tawi.



Seaweed Farm Operators who Dried their Produce

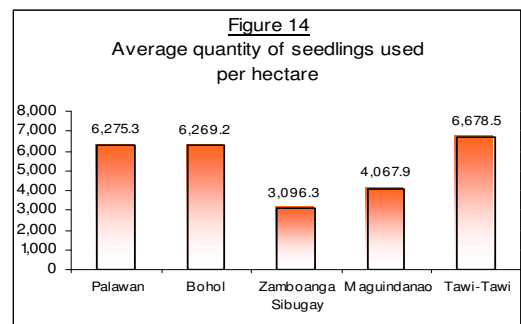
- All seaweed farm operators in Maguindanao and Tawi-Tawi dried their produce. About 97.2 percent and 96 percent of farm operators in Palawan and Bohol, respectively, dried their produce. In Zamboanga Sibugay, only 56 percent reported drying of seaweeds.



Input Usage

Seedlings

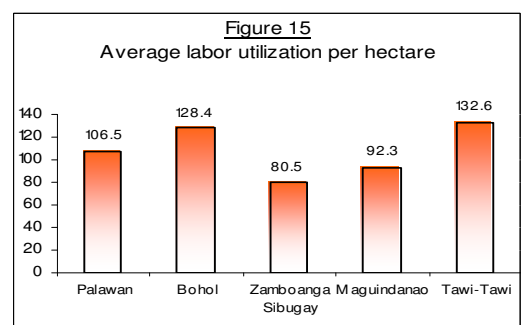
- Seedlings used in the production of seaweed averaged 4,814.1 kilograms per hectare. Average quantity of seedlings used in Zamboanga Sibugay was 3,096.3 kilograms per hectare while in Maguindanao, it was 4,067.9 kilograms. In Tawi-Tawi, Bohol and Palawan, farm operators used 6,678.5 kilograms, 6,269.2 kilograms and 6,275.3 kilograms per hectare, respectively.



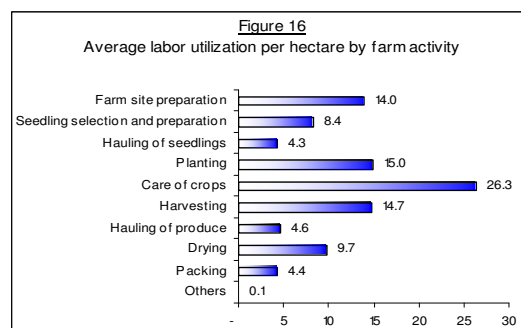
- By source, 58.4 percent of seedlings were produced by the farm operators, 39 percent were purchased and the rest were received from others for free.
- Per farm, average quantity of seedlings used ranged from 941.6 kilograms in Bohol to 2,802.8 kilograms in Maguindanao.

Labor

- Seaweed production in the five (5) provinces recorded an average labor input of 101.5 mandays per hectare.
- Labor utilization was highest in Tawi-Tawi at 132.6 mandays per hectare followed by Bohol at 128.4 mandays. Palawan labor inputs averaged 106.5 mandays while it was 92.3 mandays in Maguindanao. The lowest labor utilization was in Zamboanga Sibugay at 80.5 mandays per hectare.



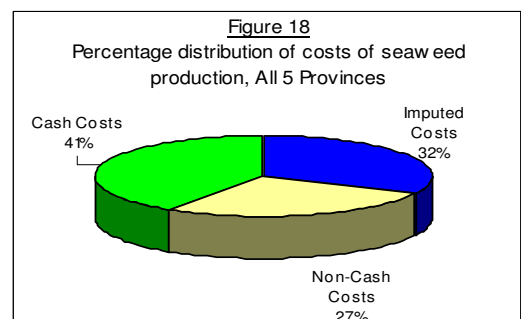
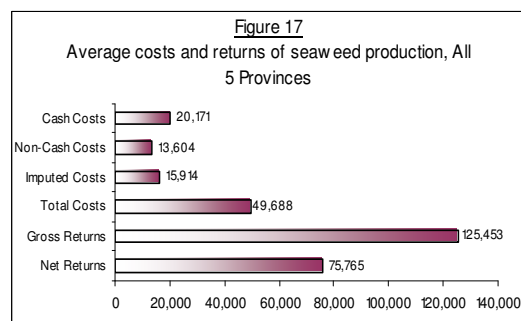
- By source, operator and family contributed the bulk of labor inputs in seaweed production. In Tawi-Tawi, operator and family labor provided 85.8 percent of the total labor inputs while hired workers contributed 14 percent. The remainder was provided by exchange labor.
- Hired labor at 43.8 mandays per hectare was highest in Bohol. The lowest was in Palawan at 10.1 mandays per hectare.
- Per farm, hired labor was highest in Maguindanao at 27.2 mandays. Average mandays per farm provided by hired labor were 4.9 in Tawi-Tawi, 6.6 in Bohol, and 6.5 in Zamboanga Sibugay. Those in Palawan provided the lowest at 2.4 mandays.
- Care of crops, planting and harvesting were the major activities in seaweed production. Labor spent for these activities accounted for more than half of the total labor requirements. Farm site preparation required 18.8 mandays in Tawi-Tawi. Those in Maguindanao spent the lowest at 9.4 mandays for farm site preparation.



Average Costs and Returns of Producing Seaweeds (Tables 19 - 31)

All 5 Provinces

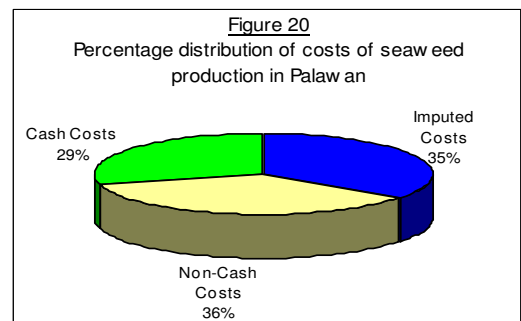
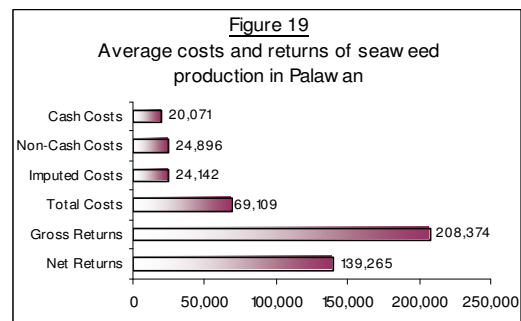
- For the five (5) provinces, the average production cost of producing seaweed was P49,688 per hectare.
- Cash costs amounted to P20,171 or 41 percent of all costs. Seedling was the major cash cost item, at 46.5 percent of all cash costs.
- Non-cash costs and imputed costs were 27 and 32 percent of the total costs, respectively.
- Average seaweed production was 29,976 kilograms per hectare.



- Seaweed farmers grossed P125,453 per hectare. Returns above cash costs averaged P105,282. Returns above cash and non-cash costs were computed at P91,678. Net returns averaged P75,765 per hectare. Farmers netted P1.52 for every peso invested in seaweed production.
- On a per kilogram basis, cost of production averaged P1.66. With an average producer price of P4.19, farmers netted P2.53 per kilogram.
- Average variable costs at P43,475 per hectare comprised 87.5 percent of all costs. Fixed costs of production amounted to P6,213 per hectare.

Palawan

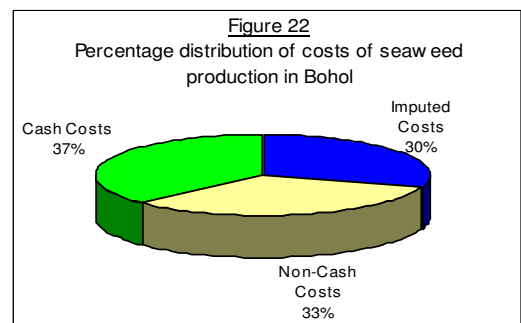
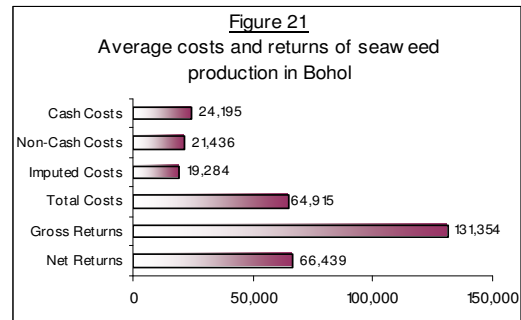
- Production of seaweed in Palawan averaged 39,387 kilograms per hectare. Seaweed farm operators grossed P208,374 per hectare.
- Cost of production averaged P69,109 per hectare. Cash costs were computed at P20,071 or 29 percent of the total cost. Major cash cost items were seedlings, supplies and fuel and oil.
- Non-cash expenses amounted to P24,896 per hectare or 36 percent of all costs while imputed costs totalled P24,142.
- Returns above cash and non-cash costs averaged P163,407 per hectare. Net returns averaged P139,265 per hectare. Seaweed farmers gained P2.02 for every peso of investment.



- Per kilogram, cost of production amounted to P1.75 while average price received by farm operators was P5.29. Seaweed farmers gained P2.02 for every peso of investment.
- Average variable costs of production amounted to P61,855 per hectare. Fixed costs averaged P7,254.

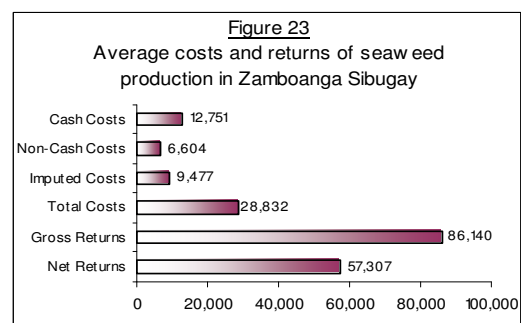
Bohol

- Production of seaweeds in Bohol averaged 33,988 kilograms per hectare worth P131,354. Cost of production averaged P64,915 per hectare or P1.91 per kilogram.
- Cash costs at P24,195 per hectare constituted about 37 percent of all costs. Cost of seedlings was the biggest item at P5,242 per hectare.
- Non-cash costs amounted to P21,436 per hectare or 33 percent of all costs. Farm operators' own-produced seedlings comprised the bulk of the costs at P21,394.
- Imputed costs averaged P19,284 per hectare. Opportunity costs of operator and family labor contributed 15.2 percent to the total cost of production.
- Net returns averaged P66,439 per hectare. A gain of P1.02 was realized for every peso invested in seaweed production.
- On the average, the variable costs of production amounted to P54,364 and fixed costs, P10,551 per hectare.

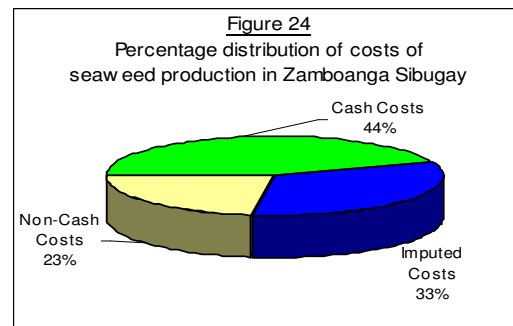


Zamboanga Sibugay

- In Zamboanga Sibugay, production per hectare averaged 19,812 kilograms with a corresponding gross value of P86,140.
- Average cost of production was P28,832 per hectare. Cash costs comprised the bulk at 44 percent. Seedling was the major cash cost item at P7,799. Non-cash costs and imputed costs shared 23 percent and 33 percent in all costs, respectively. Opportunity costs of operator labor contributed 20.1 percent to all costs.

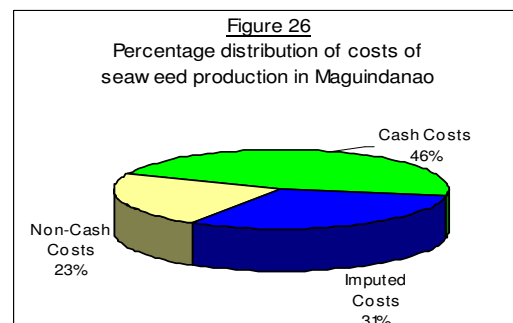
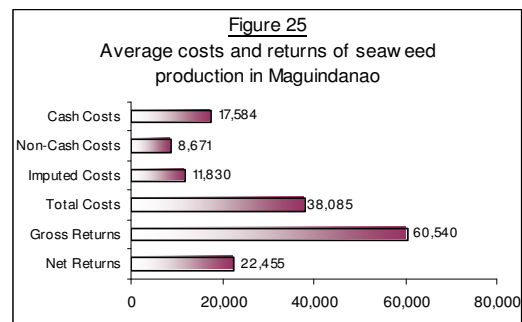


- Net returns averaged P57,307 per hectare. Seaweed farmers realized a net gain of P1.99 for every peso of investment.
- Variable costs of production averaged P26,737 per hectare while fixed costs averaged P2,095.



Maguindanao

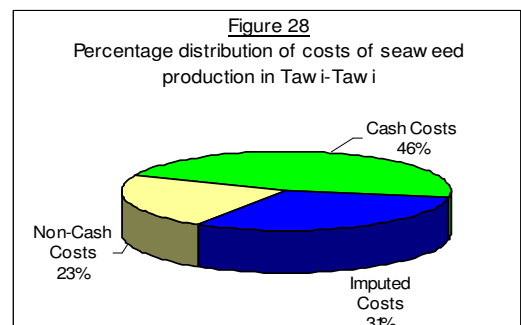
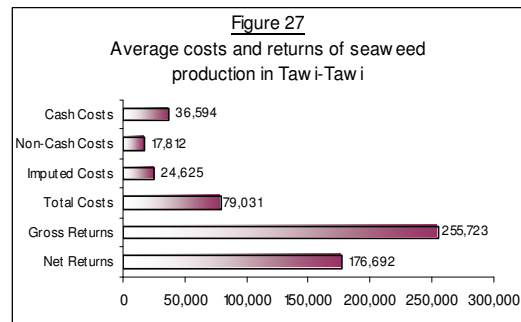
- Production of seaweed averaged 20,180 kilograms per hectare valued at P60,540.
- Average cost of production in Maguindanao was estimated at P38,085 per hectare. Cash costs amounted to P17,584 per hectare or 46 percent of all costs. Non-cash costs shared 23 percent and imputed costs, 31 percent.
- Major cash cost item was hired labor amounting to P7,390 per hectare. Cost of seedlings followed at P5,757 per hectare.
- Own-produced seedlings at P8,671 per hectare comprised the non-cash costs.
- Opportunity costs of operator labor at P3,442 and family labor at P3,660 were the major imputed cost items.



- Returns above cash costs were computed at P42,956 while returns above cash and non-cash costs were P34,285 per hectare.
- Seaweed farm operators earned 59 centavos for every peso of investment.
- Variable cost of production averaged P33,740 while fixed costs averaged P4,345 per hectare.

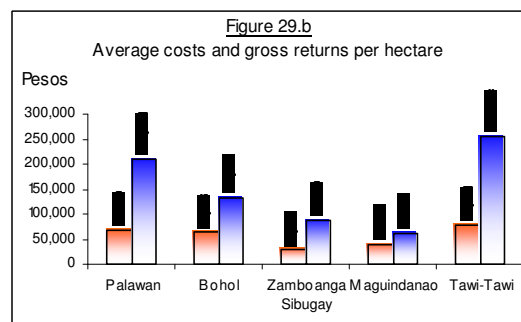
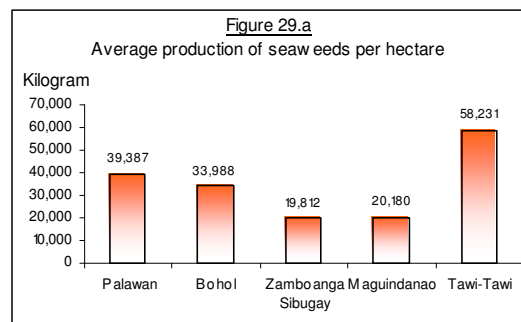
Tawi-Tawi

- Production averaged 58,231 kilograms per hectare worth P255,723.
- Seaweed production in Tawi-Tawi entailed an average cost of P79,031 per hectare. Cash costs were 46 percent of all costs. Seedlings were the major cash cost item at P21,005. Non-cash costs and imputed costs shared 23 percent and 31 percent in all costs, respectively. Opportunity cost of operator and family labor comprised the bulk of imputed costs.
- Returns above cash costs were estimated at P219,129 per hectare. Seaweed farm operators netted P176,692 per hectare and realized a gain of P2.24 per peso of investment.
- Average variable costs of production amounted to P65,765 per hectare or 83.2 percent of all costs. Fixed costs averaged P13,266 per hectare.

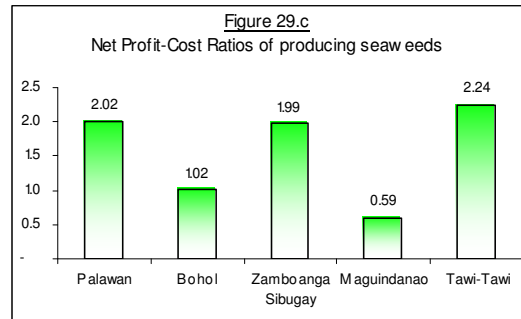


Inter-provincial Comparisons

- Among the five (5) provinces, average cost of production was highest in Tawi-Tawi at P79,031 per hectare. The lowest was in Zamboanga Sibugay at P28,832 per hectare.
- Production per hectare was highest in Tawi-Tawi at 58,231 kilograms and lowest in Zamboanga Sibugay at 19,812 kilograms.
- Tawi-Tawi grossed the highest at P255,723 per hectare. Seaweed farm operators in Palawan grossed P208,374 per hectare while those in Bohol and Zamboanga Sibugay grossed P131,354 and P86,140 per hectare, respectively. Seaweed farm operators in Maguindanao grossed the lowest at P60,540 per hectare.



- Net of all costs, returns were highest in Tawi-Tawi at P176,692. Net returns of farm operators in Palawan followed at P139,265 per hectare. In Bohol and Zamboanga Sibugay, averaged net returns were P66,439 and P57,307 per hectare, respectively. Maguindanao recorded the lowest net returns which averaged P22,455 per hectare.
- The highest net profit-cost ratio was registered in Tawi-Tawi at 2.24. Net profit-cost ratios in Palawan, Zamboanga Sibugay and Bohol were 2.02, 1.99 and 1.02, respectively. The lowest was recorded in Maguindanao at 0.59.



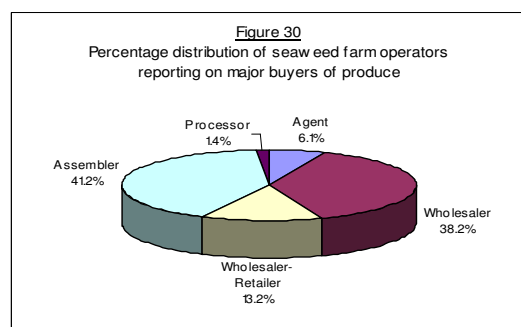
Other Information (Tables 32 - 45)

Disposition of Produce

- On the average, 94.2 percent of production in the five (5) provinces were sold. The rest were disposed as seedlings, farm workers' share, and give-aways.
- The share of the market in seaweed production ranged from 86.3 percent in Bohol to 98.1 percent in Tawi-Tawi.
- Seaweeds for seedling purposes were 13.1 percent in Bohol, 8.8 percent in Palawan, 2.9 percent in Zamboanga Sibugay, 4.4 percent in Maguindanao, and 1.4 percent in Tawi-Tawi.

Major Buyers of Produce

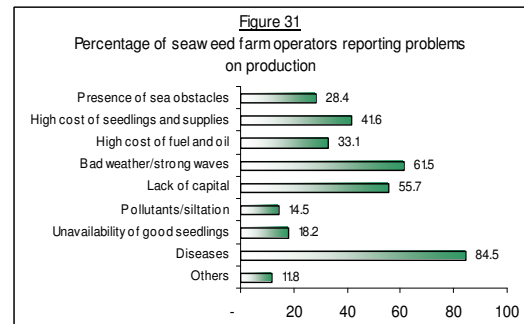
- Assemblers were the major buyers of 41.2 percent of seaweed farm operators. Wholesalers were the major buyers of 38.2 percent of seaweed farm operators.
- About 76 percent of seaweed farm operators in Maguindanao and 70.7 percent in Bohol reported assemblers as their major buyers.
- The major buyers of seaweeds in Zamboanga Sibugay and Palawan were wholesalers as reported by 68 percent and 66.2 percent of seaweed farm operators, respectively.



- In Tawi-Tawi, the major buyers were wholesalers for 48 percent and wholesaler-retailers for 42 percent of seaweed farm operators.

Production - related Problems

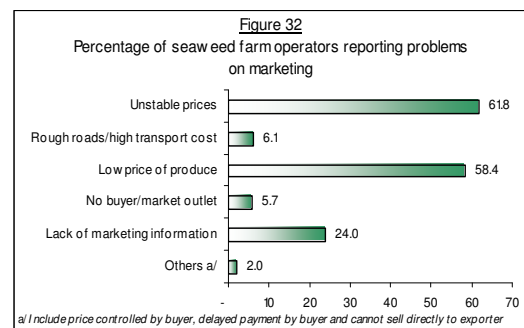
- Across provinces, the production-related problems cited by 84.5 percent of seaweed farm operators were diseases like ice-ice, epiphytes, etc. There were 61.5 percent who reported bad weather / natural calamities / strong waves as their constraints in production. Lack of capital was cited by 55.7 percent of the farm operators.



- About 70 percent of seaweed farm operators in Maguindanao and 96 percent in Tawi-Tawi were constrained by diseases like ice-ice, epiphytes, etc. Bad weather/natural calamities/strong waves were reported by 40 percent of farm operators in Bohol and 73.2 percent of operators in Palawan.
- Presence of sea obstacles was cited by 80 percent of seaweed farm operators in Tawi-Tawi.
- Lack of capital was the problem of 80 percent of seaweed farm operators in Maguindanao.

Marketing - related Problems

- About 61.8 percent of seaweed farm operators were concerned about the unstable price of seaweed. There were 58.5 percent who complained on the low price and 24 percent cited the lack of marketing information.
- The problem about unstable prices of seaweed was reported by 76.1 percent of seaweed farm operators in Palawan and 86 percent of those in Tawi-Tawi.

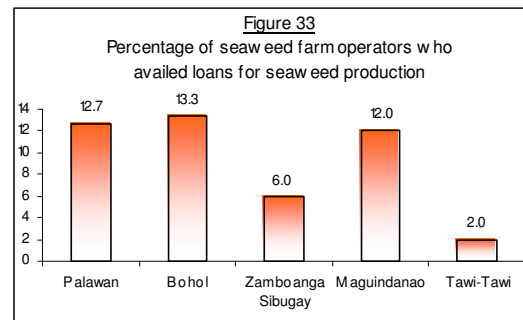


- The low price of seaweed was the complaint of 70.4 percent of seaweed farm operators in Palawan and 78 percent of operators in Tawi-Tawi.
- Lack of marketing information was the concern of 34 percent of seaweed farm operators in Maguindanao and 26 percent operators in Tawi-Tawi.

- Rough roads and high transport costs were cited by 24 percent of seaweed farmers in Maguindanao.

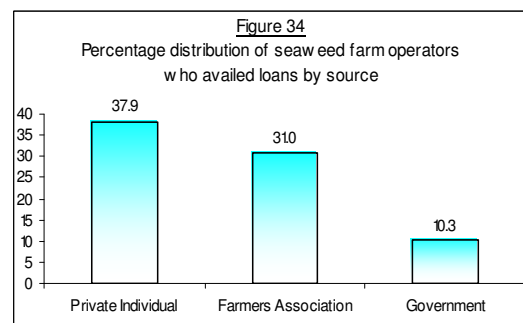
Access to Credit

- The proportions of seaweed farm operators who availed of loans were 13.3 percent in Bohol, 12.7 percent in Palawan, 12 percent in Maguindanao, 6 percent in Zamboanga Sibugay and only 2 percent in Tawi-Tawi.



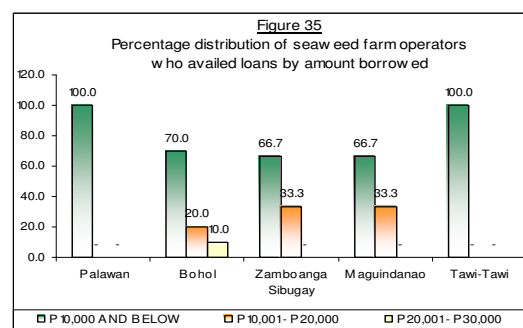
Source of Loans

- About 37.9 percent of seaweed farm operators who availed of loans sourced their loans from private individuals.
- All those who availed of loans in Maguindanao and Tawi-Tawi were serviced by private individuals.
- In Palawan, all farm operators borrowed from the farmers' association.
- Sixty seven (67) percent of operator-borrowers in Zamboanga Sibugay acquired their loans from private individuals and the remaining 33 percent, from government lending institutions such as QUEDANCOR, DSWD/LGU and Community Based Resource Management Project (CBRMP).
- In Bohol, farmers association was the source of loans of 60 percent of operator-borrowers while 20 percent each obtained their loans from private individuals and government lending institutions.



Amount of Loan Availed

- About 79.3 percent of seaweed farm operators borrowed P10,000 and below, 17.2 percent borrowed P10,001 to P20,000 and 3.5 percent borrowed P20,001-P30,000.
- Across provinces, all farm operators in Palawan and Tawi-Tawi borrowed P10,000 and below. The same amount was reported by 70 percent in Bohol and 66.7 percent each in Zamboanga Sibugay and Maguindanao.

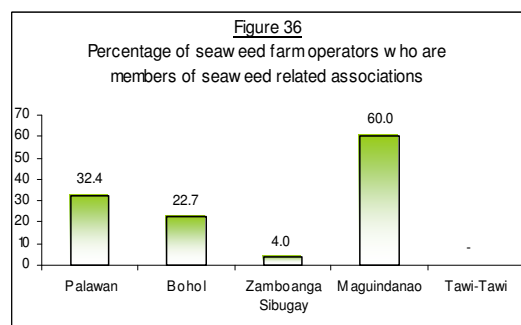


Interest Rate

- About 41.4 percent of seaweed farm operators borrowed money at an interest rate per annum of 10 percent and below. There were 3.5 percent who availed of loans with 21 - 30 percent interest rate.
- In Palawan, the interest rates for borrowing money were 10 percent and below.
- In Zamboanga Sibugay, 33.3 percent each of borrowers paid interest rates at 21-30 percent and more than 30 percent. The same percentage of borrowers did not have to pay interest on loans borrowed.
- Borrowers in Maguindanao and Tawi-Tawi did not have to pay interest on loans borrowed.

Membership to Seaweed-related Association

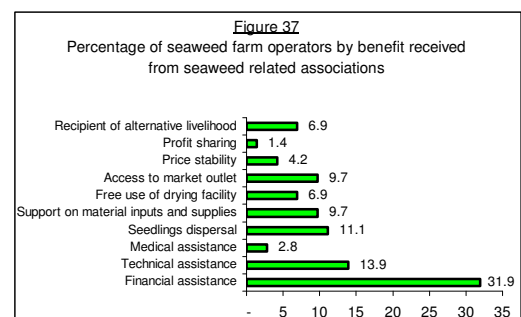
- Across the five (5) provinces, 24.3 percent of the seaweed farm operators were members of seaweed related association.
- In Maguindanao, about 60 percent of seaweed farm operators were members of seaweed-related association. Membership was reported by 32.4 percent in Palawan, 22.7 percent in Bohol, and 4 percent in Zamboanga Sibugay.



- Seaweed farm operators in Tawi-Tawi were not members of any seaweed-related association.

Benefits Received from Seaweed-related Association

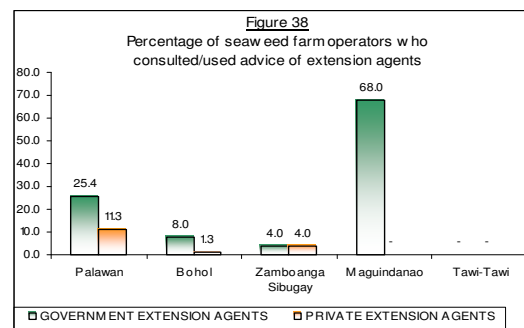
- The survey found that 31.9 percent of seaweed farm operators who are members of seaweed related association received financial assistance. About 13.9 percent were recipients of technical assistance. There were 11.1 percent who became beneficiaries on seedlings dispersals. Some 9.7 percent each mentioned access to market outlet and support on material inputs and supplies.



- Other benefits cited by other seaweed farm operators were free use of drying facility, access to alternative livelihood program, price stability, medical assistance and profit sharing.
- Financial assistance was the benefit derived by 64.7 percent of seaweed farm operators in Bohol while in Zamboanga Sibugay, 50 percent each of seaweed farmer operators were recipients of support on material inputs and supplies and alternative livelihood program.
- In Palawan, 39.1 percent of farm operators obtained financial assistance while 33.3 percent of farm operators in Maguindanao received technical assistance.

Access to Extension Services

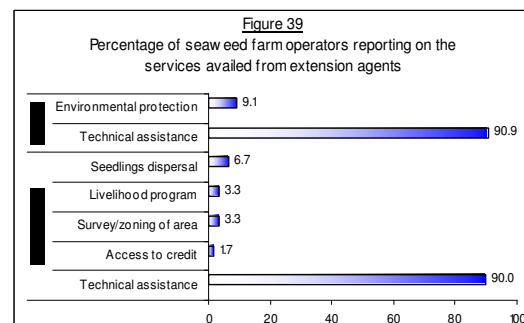
- Access to the services of government extension agents was reported by 68 percent in Maguindanao, 25.4 percent in Palawan, 8 percent in Bohol and only 4 percent in Zamboanga Sibugay.
- The services of private extension agents were reported by 11.3 percent of farm operators in Palawan, 4 percent in Zamboanga Sibugay, and 1.3 percent in Bohol.



- No seaweed farm operator in Tawi-Tawi availed of the services of extension agents.

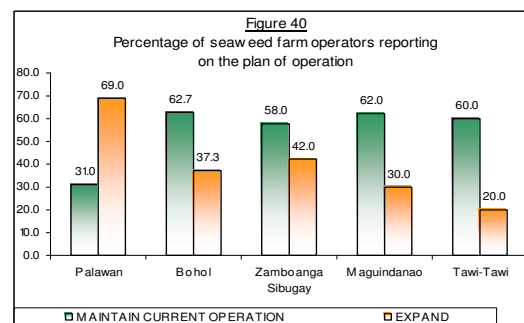
Services Availed from Extension Agents

- In most cases, farm operators asked for technical assistance from extension agents.



Plans of Seaweed Farm Operators

- In the five (5) provinces surveyed, about 53.7 percent of seaweed farm operators had plans to maintain current operation. In Bohol and Maguindanao, this was reported by at least 62 percent each of the seaweed farm operators. Expansion plans were indicated by 41.6 percent of farmers across provinces. In Palawan,

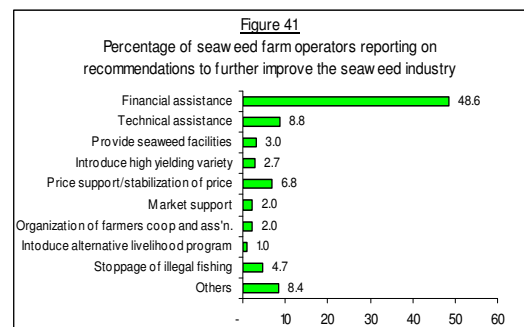


this was reported by 69 percent of seaweed farm operators while only 20 percent of farm operators in Tawi-Tawi reported the same.

- About 4.7 percent did not respond.

Recommendations for Further Improvement of Seaweed Production

- To further improve the production of seaweed, 48.7 percent of farm operators in the five (5) provinces recommended financial assistance.



- Provision of technical assistance was cited by 8.8 percent of seaweed farm operators. Other recommendations were provision of crop insurance/calamity fund, lower government tax, roll back price of gasoline and area expansion. Elimination of usage of salt during drying, ban on the use of chemicals to treat seaweeds, and assistance to safeguard seaweeds from thieves were also cited.
- Across provinces, financial assistance was recommended by 74 percent of operators in Maguindanao, 56 percent in Zamboanga Sibugay, 41.3 percent in Bohol and 24 percent of operators in Tawi-Tawi.
- Technical assistance was cited by 18.3 percent of seaweed operators in Palawan. About 14.7 percent of operators in Bohol recommended price support and stabilization of price of seaweeds. Ten (10) percent of operators in Zamboanga Sibugay suggested the stoppage of illegal fishing (use dynamite and cyanide) to further improve the seaweed industry.

STATISTICAL TABLES

Table 1 . Percentage distribution of seaweed farm operators by sex,
selected provinces, Philippines, 2007

PROVINCE	MALE	FEMALE
All 5 Provinces	91.89	8.11
Palawan	90.14	9.86
Bohol	96.00	4.00
Zamboanga Sibugay	82.00	18.00
Maguindanao	100.00	
Tawi-Tawi	90.00	10.00

Table 2 . Average age of seaweed farm operators and percentage distribution by age group, selected provinces, Philippines, 2007

PROVINCE	AVERAGE AGE (year)	AGE GROUP					
		< 31	31-40	41-50	51-60	61-70	>70
All 5 Provinces	42	16.89	33.78	27.36	17.23	3.72	1.01
Palawan	42	18.31	26.76	30.99	8.28	1.41	
Bohol	46	8.00	24.00	33.33	25.33	8.00	1.33
Zamboanga Sibugay	42	14.00	34.00	32.00	10.00	6.00	4.00
Maguindanao	39	18.00	46.00	20.00	14.00	2.00	
Tawi-Tawi	37	30.00	46.00	16.00	8.00		

Table 3 . Percentage distribution of seaweed farm operators by educational attainment,
selected provinces, Philippines, 2007

PROVINCE	ALL 5 PROVINCES	PALAWAN	BOHOL	ZAMBOANGA SIBUGAY	MAGUINDANAO	TAWI - TAWI
Elementary Level	37.84	43.66	50.67	30.00	26.00	30.00
Elementary Graduate	18.24	15.49	18.67	20.00	36.00	2.00
High School Level	18.24	19.72	5.33	18.00	8.28	38.00
High School Graduate	10.47	11.27	8.00	12.00	18.00	4.00
College Level	8.45	5.63	8.00	6.00	2.00	22.00
College Graduate	3.38	1.41	6.67	4.00		4.00
Vocational	0.34	1.41				
No schooling	3.04	1.41	2.67	10.00	2.00	

Table 4 . Average farming experience of seaweed farm operators and percentage distribution by number of years engaged in seaweed production, selected provinces, Philippines, 2007

PROVINCE	AVERAGE FARMING EXPERIENCE (year)	YEARS ENGAGED IN SEAWEED PRODUCTION			
		<11	11-20	21-30	>30
All 5 Provinces	9	75.00	20.61	3.72	0.68
					8.28
Palawan	10	69.01	23.94	7.04	
Bohol	8	78.67	18.67	1.33	1.33
Zamboanga Sibugay	8	76.00	22.00	2.00	
Maguindanao	6	98.00	2.00		
Tawi-Tawi	13	54.00	36.00	8.00	2.00

Table 5 . Percentage distribution of seaweed farm operators by main occupation,
selected provinces, Philippines, 2007

OCCUPATION	ALL 5 PROVINCES	PALAWAN	BOHOL	ZAMBOANGA SIBUGAY	MAGUINDANAO	TAWI - TAWI
Officials of Government a/	0.68			2.00		2.00
Professional	1.69			6.00		4.00
Technician and Associate Professionals						
Clerks						
Service Workers and Shop and Market Sales Workers	0.34			2.00		
Farmers, Forestry Workers and Fishermen	80.74	61.97	74.67	88.00	100.00	90.00
Seaweed Farmer	94.56	100.00	100.00	77.27	96.00	97.78
Trades and Related Workers	15.20	38.03	24.00			
Plant and Machine Operators and Assemblers	0.34		1.33			
Laborers and Unskilled Workers	0.34			2.00		
Special Occupations	0.68					4.00

a/ Includes those in Special-Interest Organizations, Corporate Executives, Managers, Managing Proprietors and Supervisors

Table 6 . Average number of farms per farm operator, average farm size and area of focus farm, selected provinces, Philippines, 2007

PROVINCE	NUMBER OF FARMS PER OPERATOR	AVERAGE AREA (HA)	
		ALL FARMS	FOCUS FARM
All 5 Provinces	1.48	0.48	0.33
Palawan	1.52	0.23	0.23
Bohol	1.41	0.46	0.15
Zamboanga Sibugay	1.58	0.69	0.45
Maguindanao	1.30	0.70	0.69
Tawi-Tawi	1.62	0.44	0.26

Table 7 . Average area harvested of seaweed focus farms by variety planted,
selected provinces, Philippines, 2007
(hectare)

PROVINCE	COTTONII	ALVAREZII	SPINOSUM
All 5 Provinces	0.35	0.37	0.09
Palawan	0.23		
Bohol	0.18		0.09
Zamboanga Sibugay	0.51	0.38	
Maguindanao	0.69		
Tawi-Tawi	0.26	0.26	

Table 8 . Percentage of farmers reporting by type of investment used in seaweed production, selected provinces, Philippines, 2007

PROVINCE	ALL 5 PROVINCES	PALAWAN	BOHOL	ZAMBOANGA SIBUGAY	MAGUINDANAO	TAWI - TAWI
Farm structures						
Farm office	0.34				2.00	
Farm house	12.50		10.67	16.00	8.28	22.00
Storage of supplies and dried seaweeds	10.47	23.94	8.00		2.00	14.00
Caretaker's house	1.35	2.82	1.33	2.00		
Drying platform	27.36	12.68	38.67	2.00		84.00
Others structures	0.68		2.67			
Farm machines, tools and equipment						
Generator	3.04		2.67			14.00
Engine	19.93	5.63	21.33	2.00		76.00
Boat	92.23	92.96	89.33	92.00	90.00	98.00
Tricycle	1.35			2.00	6.00	
Pick-up	0.34				2.00	
Raft (bamboo)	2.70		5.33	8.00		
Raft (styrofoam)	7.09	2.82	12.00	6.00	2.00	12.00
Paddle	71.28	83.10	28.00	92.00	72.00	98.00
Mesh net	48.65	76.06	58.67	2.00	12.00	78.00
Goggles/snorkeling mask	45.61	76.06	49.33	14.00	6.00	68.00
Cultivation frame						
Sinker/Anchor	23.31	25.35	5.33	42.00	2.00	50.00
Floater (styrofoam)	47.97	83.10	40.00	48.00	24.00	34.00
Floater (plastic bottle)	21.62	11.27	12.00	42.00	30.00	22.00
Pole (concrete)	0.68	1.41	1.33			
Pole (bamboo/mangrove)	50.00	53.52	57.33	46.00		88.00
Polyethylene rope (#6-7)	26.35	39.44	30.67	12.00	16.00	26.00
Polyethylene rope (#10)	18.92	30.99	6.67	18.00	36.00	4.00
Polyethylene rope (#14)	13.51	19.72	8.00	8.00	32.00	
Polyethylene rope (others)	46.96	46.48	18.67	42.00	74.00	68.00
Monofilament # 110 test lbs	11.49	39.44	1.33			10.00
Bolo/knife	95.27	88.73	97.33	94.00	98.00	100.00
Digging bar	24.66	11.27	45.33	4.00		58.00
Hammer/mallet	22.64	16.90	22.67	2.00	16.00	58.00
Gas lamp	11.15	1.41	6.67		16.00	38.00
Basket	42.57	88.73	20.00	10.00	38.00	48.00
Crate	3.04		12.00			
Weighing scale	13.51	12.68	10.67	4.00	14.00	28.00
Gloves	8.11	21.13	8.00	6.00		
Plastic cover	31.42	11.27	22.67	6.00	34.00	96.00
Others a/	27.03	21.13	48.00	46.00	10.00	2.00

a/ Include binder, container, flippers, iron bar, net, plastic cover (trapal), sacks, screen, scoop net, scissors, styrofoam and tent

Table 9 . Percentage distribution of seaweed farm operators by
number of croppings per year, selected provinces,
Philippines, 2007

PROVINCE	NUMBER OF CROPPINGS				
	ONE	TWO	THREE	FOUR	> FOUR
All 5 Provinces	20.95	20.95	33.78	13.51	10.81
					8.28
Palawan	35.21	21.13	36.62	7.04	
Bohol	24.00	32.00	9.33	6.67	28.00
Zamboanga Sibugay	6.00	32.00	36.00	12.00	14.00
Maguindanao		14.00	72.00	14.00	
Tawi-Tawi	32.00		26.00	34.00	8.00

Table 10 . Percentage distribution of seaweed farm operators by variety planted,
selected provinces, Philippines, 2007

PROVINCE	COTTONII	ALVAREZII	SPINOSUM
All 5 Provinces	85.14	7.09	7.77
Palawan	100.00		
Bohol	69.33		30.67
Zamboanga Sibugay	60.00	40.00	
Maguindanao	100.00		
Tawi-Tawi	98.00	2.00	

Table 11 . Percentage distribution of seaweed farm operators by culture method,
selected provinces, Philippines, 2007

PROVINCE	MONOLINE FLOATING	MONOLINE BOTTOM	TRIANGULAR
All 5 Provinces	69.59	28.38	2.03
Palawan	90.14	2.82	7.04
Bohol	33.33	65.33	1.33
Zamboanga Sibugay	96.00	4.00	
Maguindanao	100.00		
Tawi-Tawi	38.00	62.00	

Table 12 . Percentage of seaweed farm operators reporting on the source of seedlings,
selected provinces, Philippines, 2007

PROVINCE	PURCHASED	OWN PRODUCED	RECEIVED FROM OTHERS
All 5 Provinces	50.34	65.88	2.36
Palawan	26.76	67.61	5.63
Bohol	33.33	66.67	1.33
Zamboanga Sibugay	82.00	70.00	2.00
Maguindanao	76.00	78.00	
Tawi-Tawi	52.00	46.00	2.00

Table 13 . Percentage distribution of seaweed farm operators by month of planting,
selected provinces, Philippines, 2007

MONTH	ALL 5 PROVINCES	PALAWAN	BOHOL	ZAMBOANGA SIBUGAY	MAGUINDANAO	TAWI - TAWI
2006						
November	1.35		5.33			
December	0.68		2.67		8.28	
2007						
January	3.04		6.67	6.00		2.00
February	2.36		6.67	2.00		2.00
March	3.38	5.63	2.67	8.00		
April	3.72	9.86	1.33	6.00		
May	6.42	16.90		12.00	2.00	
June	3.72	5.63	2.67	10.00		
July	2.70	1.41	2.67	6.00	4.00	
August	9.12	14.08	13.33	6.00	6.00	2.00
September	19.26	23.94	16.00	14.00	16.00	26.00
October	36.82	22.54	34.67	26.00	56.00	52.00
November	7.43		5.33	4.00	16.00	16.00

Table 14 . Percentage distribution of seaweed farm operators by month of harvesting,
selected provinces, Philippines, 2007

MONTH	ALL 5 PROVINCES	PALAWAN	BOHOL	ZAMBOANGA SIBUGAY	MAGUINDANAO	TAWI - TAWI
January						
February	0.68		2.67			
March	3.72		9.33	6.00		2.00
April	2.70	1.41	5.33	4.00		2.00
May	3.38	4.23	6.67	4.00		
June	7.09	16.90	1.33	14.00	2.00	
July	2.70	8.45		4.00		
August	4.73	7.04	2.67	14.00		
September	2.03	1.41	2.67	4.00	2.00	
October	11.49	14.08	12.00	14.00	14.00	2.00
November	18.58	21.13	17.33	8.00	14.00	32.00
December	42.91	25.35	40.00	28.00	68.00	62.00

Table 15 . Percentage of seaweed farm operators who
dried their produce, selected provinces,
Philippines, 2007

PROVINCE	PERCENT
All 5 Provinces	90.88
Palawan	97.18
Bohol	96.00
Zamboanga Sibugay	56.00
Maguindanao	100.00
Tawi-Tawi	100.00

Table 16 . Average quantity of seedlings used by source, selected provinces, Philippines, 2007
(kilogram)

PROVINCE	PURCHASED		OWN PRODUCED		RECEIVED FROM OTHERS		ALL SOURCES	
	PER HECTARE	PER FARM	PER HECTARE	PER FARM	PER HECTARE	PER FARM	PER HECTARE	PER FARM
All 5 Provinces	1,875.38	620.52	2,809.17	929.49	129.57	42.87	4,814.11	1,592.88
Palawan	2,019.79	468.31	3,560.00	825.42	8.28	161.27	6,275.32	1,455.00
Bohol	1,454.29	218.41	4,806.06	721.80	8.88	1.33	6,269.23	941.55
Zamboanga Sibugay	1,678.68	763.04	1,410.98	641.36	6.60	3.00	3,096.26	1,407.40
Maguindanao	1,588.97	1,094.80	2,478.96	1,708.00			4,067.92	2,802.80
Tawi-Tawi	3,156.67	823.00	3,445.87	898.40	75.94	19.80	6,678.48	1,741.20

Table 17 . Average labor utilization for seaweed production, by source of labor and sex, selected provinces, Philippines, 2007
(manday)

SOURCE / SEX	ALL 5 PROVINCES		PALAWAN		BOHOL		ZAMBOANGA SIBUGAY		MAGUINDANAO		TAWI - TAWI	
	PER HECTARE	PER FARM	PER HECTARE	PER FARM	PER HECTARE	PER FARM	PER HECTARE	PER FARM	PER HECTARE	PER FARM	PER HECTARE	PER FARM
Operator												
Both sexes	45.10	14.92	60.30	13.98	52.20	7.84	52.04	23.66	23.93	16.49	63.65	16.60
Male	42.98	14.22	58.13	13.48	8.28	6.75	49.26	22.39	23.77	16.37	61.98	16.16
Female	2.12	0.70	2.16	0.50	7.22	1.08	2.78	1.27	0.16	0.11	1.67	0.44
Family												
Both sexes	29.51	9.76	35.55	8.24	32.45	4.87	14.06	6.39	28.08	19.35	50.07	13.06
Male	22.00	7.28	31.31	7.26	17.22	2.59	6.36	2.89	27.64	19.05	26.76	6.98
Female	7.51	2.48	4.24	0.98	15.23	2.29	7.70	3.50	0.44	0.30	23.32	6.08
Exchange												
Both sexes	0.42	0.14	0.49	0.11			0.02	0.01	0.86	0.60	0.21	0.06
Male	0.42	0.14	0.49	0.11			0.02	0.01	0.86	0.60	0.21	0.06
Female												
Hired												
Both sexes	26.42	8.74	10.14	2.35	43.76	6.57	14.35	6.52	39.45	27.18	18.62	4.86
Male	23.14	7.66	10.05	2.33	34.03	5.11	11.69	5.31	36.16	24.91	15.80	4.12
Female	3.29	1.09	0.09	0.02	9.73	1.46	2.66	1.21	3.29	2.27	2.82	0.74
All sources												
Both sexes	101.46	33.57	106.48	24.69	128.40	19.28	80.47	36.58	92.32	63.61	132.56	34.56
Male	88.54	29.30	99.98	23.18	96.22	14.45	67.33	30.60	88.43	60.93	104.75	27.31
Female	12.92	4.27	6.50	1.51	32.18	4.83	13.15	5.98	3.90	2.69	27.81	7.25

Table 18 . Average labor utilization for seaweed production per hectare, by farm activity and sex,
selected provinces, Philippines, 2007
(manday)

FARM ACTIVITY	ALL 5 PROVINCES			PALAWAN			BOHOL			ZAMBOANGA SIBUGAY			MAGUINDANAO			TAWI - TAWI		
	BOTH SEXES	MALE	FEMALE	BOTH SEXES	MALE	FEMALE	BOTH SEXES	MALE	FEMALE	BOTH SEXES	MALE	FEMALE	BOTH SEXES	MALE	FEMALE	BOTH SEXES	MALE	FEMALE
Farm site preparation	13.97	13.17	0.80	17.30	15.52	1.78	11.48	10.24	1.23	16.95	16.40	0.55	9.39	9.35	0.04	18.80	17.16	1.64
Installation of cultivation frames	9.66	9.12	0.54	9.38	8.28	1.10	7.95	7.61	0.33	12.98	12.57	0.41	7.09	7.06	0.04	12.48	10.92	1.56
Cutting of grasses and removal of predators	4.31	4.05	0.26	7.92	7.24	0.68	3.53	2.63	0.90	3.97	3.83	0.14	2.29	2.29		6.32	6.24	0.08
Seedling selection and preparation	8.37	5.77	2.60	7.93	7.49	0.43	21.71	11.06	10.65	6.85	4.96	1.89	2.51	2.48	0.03	15.51	9.12	6.39
Hauling of seedlings	4.34	4.03	0.31	1.86	1.81	0.05	6.86	6.17	0.69	1.48	1.29	0.19	5.74	5.74		6.61	5.26	1.35
Planting	14.97	13.00	1.96	12.56	11.89	0.67	18.37	13.51	4.86	11.77	9.10	2.67	15.27	15.27		19.87	14.81	5.06
Care of crops	26.33	24.14	2.19	25.32	24.57	0.75	21.26	16.76	4.51	26.75	22.09	4.66	31.28	31.28		18.19	14.71	3.48
Harvesting	14.74	13.10	1.64	15.95	14.31	1.65	23.33	18.47	4.86	8.84	7.58	1.26	13.74	13.56	0.18	18.72	15.36	3.36
Hauling of produce	4.63	4.39	0.24	6.46	6.32	0.14	7.39	7.13	0.26	0.91	0.65	0.26	4.67	4.67		6.30	5.37	0.94
Drying	9.70	6.87	2.83	12.63	11.80	0.83	15.35	10.60	4.75	4.93	3.70	1.23	6.94	3.29	3.65	16.74	12.40	4.34
Packing	4.36	4.04	0.31	6.47	6.27	0.20	2.20	2.04	0.16	1.99	1.57	0.42	2.79	2.79		11.82	10.57	1.25
Others	0.05	0.03	0.03				0.45	0.23	0.23									
Total	101.46	88.54	12.92	106.48	99.98	6.50	128.40	96.22	32.18	80.47	67.33	13.15	92.32	88.43	3.90	132.56	104.75	27.81

Table 19 . Average costs and returns of seaweed production, All 5 Provinces, 2007

ITEM	PER HECTARE			PER FARM (P)	PER KILOGRAM (P)
	QUANTITY	UNIT	VALUE (P)		
Production	29,976	kg	125,453	41,509	4.19
Area harvested	0.33	ha			
Number of farms	296				
CASH COSTS			20,171	6,674	0.67
Seedlings	1,875.38	kg	9,384	3,105	0.31
Hired Labor	26.42	manday	4,425	1,464	0.15
Salaries of employees			153	51	0.01
Wage of caretaker			112	37	b/
Rentals:			124	41	b/
Dryer			40	13	b/
Engine			35	11	b/
Boat			35	12	b/
Tools and equipment			10	3	b/
Storage			4	1	b/
Fuel and oil			1,093	362	0.04
Transport cost of inputs			737	244	0.02
License/permits/cooperative fees			177	58	0.01
Interest payment on loan			84	28	b/
Supplies			3,577	1,183	0.12
Food expense			206	68	0.01
Repairs/improvements			100	33	b/
NON-CASH COSTS			13,604	4,501	0.45
Seedlings (own produced)	2,809.17	kg	13,562	4,487	0.45
Harvesters' share	0.10	kg	a/	a/	b/
Other laborers' share	0.33	kg	2	1	b/
Supplies			39	13	b/
IMPUTED COSTS			15,914	5,265	0.53
Seedlings (received from others)	129.57	kg	799	265	0.03
Operator labor	45.10	manday	5,396	1,786	0.18
Family labor	29.51	manday	3,527	1,167	0.12
Exchange labor	0.42	manday	62	21	b/
Rentals:					
Boat			1	a/	b/
Supplies			174	58	0.01
Depreciation			3,744	1,239	0.12
Interest on operating capital			2,209	731	0.07
TOTAL COSTS			49,688	16,441	1.66
GROSS RETURNS			125,453	41,509	4.19
RETURNS ABOVE CASH COSTS			105,282	34,835	3.51
RETURNS ABOVE CASH AND NON-CASH COSTS			91,678	30,334	3.06
NET RETURNS			75,765	25,069	2.53
NET PROFIT-COST RATIO			1.52	1.52	1.52

a/ Less than 1

b/ Less than 0.01

Table 20 . Average variable and fixed costs of seaweed production, All 5 Provinces, 2007
(peso)

ITEM	PER HECTARE	PER FARM	PER KILOGRAM
VARIABLE COSTS	43,475	14,385	1.45
Seedlings			
Purchased	9,384	3,105	0.31
Own produced	13,562	4,487	0.45
Received from others	799	265	0.03
Labor			
Hired Labor	4,425	1,464	0.15
Operator labor	5,396	1,786	0.18
Family labor	3,527	1,167	0.12
Exchange labor	62	21	b/
Salaries of employees	153	51	0.01
Wage of caretaker	112	37	b/
Rentals:	125	41	b/
Dryer	40	13	b/
Engine	35	11	b/
Boat	36	12	b/
Tools and equipment	10	3	b/
Others	4	1	b/
Fuel and oil	1,093	362	0.04
Transport cost of inputs	737	244	0.02
Supplies	3,790	1,254	0.13
Food expense	206	68	0.01
Repairs/improvements	100	33	b/
Harvesters' share	a/	a/	b/
Other laborers' share	2	1	b/
FIXED COSTS	6,213	2,056	0.21
License/permits/cooperative fees	177	58	0.01
Interest payment on loan	84	28	b/
Depreciation	3,744	1,239	0.12
Interest on operating capital	2,209	731	0.07
TOTAL COSTS	49,688	16,441	1.66

a/ Less than 1

b/ Less than 0.01

Table 21 . Average costs and returns of seaweed production, Palawan, 2007

ITEM	PER HECTARE			PER FARM (P)	PER KILOGRAM (P)
	QUANTITY	UNIT	VALUE (P)		
Production	39,387	kg	208,374	48,314	5.29
Area harvested	0.23	ha			
Number of farms	71				
CASH COSTS			20,071	4,654	0.51
Seedlings	2,019.79	kg	12,793	2,966	0.32
Hired Labor	10.14	manday	1,581	367	0.04
Rentals:					
Boat			46	11	a/
Fuel and oil			1,693	393	0.04
Transport cost of inputs			497	115	0.01
License/permits/cooperative fees			490	114	0.01
Interest payment on loan			68	16	a/
Supplies			2,839	658	0.07
Food expense			18	4	a/
Repairs/improvements			46	11	a/
NON-CASH COSTS			24,896	5,772	0.63
Seedlings (own produced)	3,560.00	kg	24,816	5,754	0.63
Supplies			80	19	a/
IMPUTED COSTS			24,142	5,598	0.61
Seedlings (received from others)	695.54	kg	4,204	975	0.11
Operator labor	60.30	manday	8,014	1,858	0.20
Family labor	35.55	manday	5,083	1,178	0.13
Exchange labor	0.49	manday	59	14	a/
Supplies			87	20	a/
Depreciation			4,396	1,019	0.11
Interest on operating capital			2,300	533	0.06
TOTAL COSTS			69,109	16,024	1.75
GROSS RETURNS			208,374	48,314	5.29
RETURNS ABOVE CASH COSTS			188,303	43,660	4.78
RETURNS ABOVE CASH AND NON-CASH COSTS			163,407	37,888	4.15
NET RETURNS			139,265	32,290	3.54
NET PROFIT-COST RATIO			2.02	2.02	2.02

a/ Less than 0.01

Table 22 . Average variable and fixed costs of seaweed production, Palawan, 2007
(peso)

ITEM	PER HECTARE	PER FARM	PER KILOGRAM
VARIABLE COSTS	61,855	14,342	1.57
Seedlings			
Purchased	12,793	2,966	0.32
Own produced	24,816	5,754	0.63
Received from others	4,204	975	0.11
Labor			
Hired Labor	1,581	367	0.04
Operator labor	8,014	1,858	0.20
Family labor	5,083	1,178	0.13
Exchange labor	59	14	a/
Rentals:			
Boat	46	11	a/
Fuel and oil	1,693	393	0.04
Transport cost of inputs	497	115	0.01
Supplies	3,006	697	0.08
Food expense	18	4	a/
Repairs/improvements	46	11	a/
FIXED COSTS	7,254	1,682	0.18
License/permits/cooperative fees	490	114	0.01
Interest payment on loan	68	16	a/
Depreciation	4,396	1,019	0.11
Interest on operating capital	2,300	533	0.06
TOTAL COSTS	69,109	16,024	1.75

a/ Less than 0.01

Table 23 . Average costs and returns of seaweed production, Bohol, 2007

ITEM	PER HECTARE			PER FARM (P)	PER KILOGRAM (P)
	QUANTITY	UNIT	VALUE (P)		
Production	33,988	kg	131,354	19,727	3.86
Area harvested	0.15	ha			
Number of farms	75				
CASH COSTS			24,195	3,634	0.71
Seedlings	1,454.29	kg	5,242	787	0.15
Hired Labor	43.76	manday	6,807	1,022	0.20
Salaries of employees			932	140	0.03
Wage of caretaker			178	27	0.01
Rentals:			302	45	0.01
Dryer			89	13	a/
Boat			89	13	a/
Tools and equipment			89	13	a/
Storage			36	5	a/
Fuel and oil			2,140	321	0.06
Transport cost of inputs			133	20	a/
License/permits/cooperative fees			725	109	0.02
Interest payment on loan			628	94	0.02
Supplies			6,374	957	0.19
Food expense			722	108	0.02
Repairs/improvements			12	2	a/
NON-CASH COSTS			21,436	3,219	0.63
Seedlings (own produced)	4,806.06	kg	21,394	3,213	0.63
Supplies			42	6	a/
IMPUTED COSTS			19,284	2,896	0.57
Seedlings (received from others)	8.88	kg	36	5	a/
Operator labor	52.20	manday	6,287	944	0.18
Family labor	32.45	manday	3,596	540	0.11
Supplies			167	25	a/
Depreciation			7,271	1,092	0.21
Interest on operating capital			1,928	290	0.06
TOTAL COSTS			64,915	9,749	1.91
GROSS RETURNS			131,354	19,727	3.86
RETURNS ABOVE CASH COSTS			107,159	16,094	3.15
RETURNS ABOVE CASH AND NON-CASH COSTS			85,723	12,874	2.52
NET RETURNS			66,439	9,978	1.95
NET PROFIT-COST RATIO			1.02	1.02	1.02

a/ Less than 0.01

Table 24 . Average variable and fixed costs of seaweed production, Bohol, 2007
(peso)

ITEM	PER HECTARE	PER FARM	PER KILOGRAM
VARIABLE COSTS	54,364	8,165	1.60
Seedlings			
Purchased	5,242	787	0.15
Own produced	21,394	3,213	0.63
Received from others	36	5	a/
Labor			
Hired Labor	6,807	1,022	0.20
Operator labor	6,287	944	0.18
Family labor	3,596	540	0.11
Salaries of employees	932	140	0.03
Wage of caretaker	178	27	0.01
Rentals:	302	45	0.01
Dryer	89	13	a/
Boat	89	13	a/
Tools and equipment	89	13	a/
Others	36	5	a/
Fuel and oil	2,140	321	0.06
Transport cost of inputs	133	20	a/
Supplies	6,583	989	0.19
Food expense	722	108	0.02
Repairs/improvements	12	2	a/
FIXED COSTS	10,551	1,585	0.31
License/permits/cooperative fees	725	109	0.02
Interest payment on loan	628	94	0.02
Depreciation	7,271	1,092	0.21
Interest on operating capital	1,928	290	0.06
TOTAL COSTS	64,915	9,749	1.91

a/ Less than 0.01

Table 25 . Average costs and returns of seaweed production, Zamboanga Sibugay, 2007

ITEM	PER HECTARE			PER FARM (P)	PER KILOGRAM (P)
	QUANTITY	UNIT	VALUE (P)		
Production	19,812	kg	86,140	39,155	4.35
Area harvested	0.45	ha			
Number of farms	50				
CASH COSTS			12,751	5,796	0.64
Seedlings	1,678.68	kg	7,799	3,545	0.39
Hired Labor	14.35	manday	2,030	923	0.10
Rentals:			231	105	0.01
Dryer			82	37	a/
Engine			141	64	0.01
Boat			9	4	a/
Fuel and oil			8	4	a/
Transport cost of inputs			26	12	a/
Supplies			2,576	1,171	0.13
Food expense			26	12	a/
Repairs/improvements			55	25	a/
NON-CASH COSTS			6,604	3,002	0.33
Seedlings (own produced)	1,410.98	kg	6,594	2,997	0.33
Supplies			11	5	a/
IMPUTED COSTS			9,477	4,308	0.48
Seedlings (received from others)	6.60	kg	26	12	a/
Operator labor	52.04	manday	5,798	2,635	0.29
Family labor	14.06	manday	1,555	707	0.08
Exchange labor	0.02	manday	3	1	a/
Depreciation			523	238	0.03
Interest on operating capital			1,573	715	0.08
TOTAL COSTS			28,832	13,106	1.46
GROSS RETURNS			86,140	39,155	4.35
RETURNS ABOVE CASH COSTS			73,389	33,359	3.70
RETURNS ABOVE CASH AND NON-CASH COSTS			66,784	30,357	3.37
NET RETURNS			57,307	26,049	2.89
NET PROFIT-COST RATIO			1.99	1.99	1.99

a/ Less than 0.01

Table 26 . Average variable and fixed costs of seaweed production,
Zamboanga Sibugay, 2007
(peso)

ITEM	PER HECTARE	PER FARM	PER KILOGRAM
VARIABLE COSTS	26,737	12,153	1.35
Seedlings			
Purchased	7,799	3,545	0.39
Own produced	6,594	2,997	0.33
Received from others	26	12	a/
Labor			
Hired Labor	2,030	923	0.10
Operator labor	5,798	2,635	0.29
Family labor	1,555	707	0.08
Exchange labor	3	1	a/
Rentals:	231	105	0.01
Dryer	82	37	a/
Engine	141	64	0.01
Boat	9	4	a/
Fuel and oil	8	4	a/
Transport cost of inputs	26	12	a/
Supplies	2,587	1,176	0.13
Food expense	26	12	a/
Repairs/improvements	55	25	a/
FIXED COSTS	2,095	952	0.11
Depreciation	523	238	0.03
Interest on operating capital	1,573	715	0.08
TOTAL COSTS	28,832	13,106	1.46

a/ Less than 0.01

Table 27 . Average costs and returns of seaweed production, Maguindanao, 2007

ITEM	PER HECTARE			PER FARM (P)	PER KILOGRAM (P)
	QUANTITY	UNIT	VALUE (P)		
Production	20,180	kg	60,540	41,712	3.00
Area harvested	0.69	ha			
Number of farms	50				
CASH COSTS			17,584	12,115	0.87
Seedlings	1,588.97	kg	5,757	3,967	0.29
Hired Labor	39.45	manday	7,390	5,092	0.37
Rentals:			74	51	a/
Dryer			30	21	a/
Boat			44	30	a/
Fuel and oil			235	162	0.01
Transport cost of inputs			35	24	a/
License/permits/cooperative fees			31	21	a/
Supplies			4,021	2,770	0.20
Food expense			32	22	a/
Repairs/improvements			9	6	a/
NON-CASH COSTS			8,671	5,975	0.43
Seedlings (own produced)	2,478.96	kg	8,671	5,975	0.43
IMPUTED COSTS			11,830	8,151	0.59
Operator labor	23.93	manday	3,442	2,372	0.17
Family labor	28.08	manday	3,660	2,522	0.18
Exchange labor	0.86	manday	140	96	0.01
Rentals:					
Boat			3	2	a/
Supplies			271	186	0.01
Depreciation			2,211	1,523	0.11
Interest on operating capital			2,103	1,449	0.10
TOTAL COSTS			38,085	26,241	1.89
GROSS RETURNS			60,540	41,712	3.00
RETURNS ABOVE CASH COSTS			42,956	29,597	2.13
RETURNS ABOVE CASH AND NON-CASH COSTS			34,285	23,622	1.70
NET RETURNS			22,455	15,472	1.11
NET PROFIT-COST RATIO			0.59	0.59	0.59

a/ Less than 0.01

Table 28 . Average variable and fixed costs of seaweed production, Maguindanao, 2007
(peso)

ITEM	PER HECTARE	PER FARM	PER KILOGRAM
VARIABLE COSTS	33,740	23,247	1.67
Seedlings			
Purchased	5,757	3,967	0.29
Own produced	8,671	5,975	0.43
Labor			
Hired Labor	7,390	5,092	0.37
Operator labor	3,442	2,372	0.17
Family labor	3,660	2,522	0.18
Exchange labor	140	96	0.01
Rentals:	77	53	a/
Dryer	30	21	a/
Boat	46	32	a/
Fuel and oil	235	162	0.01
Transport cost of inputs	35	24	a/
Supplies	4,292	2,957	0.21
Food expense	32	22	a/
Repairs/improvements	9	6	a/
FIXED COSTS	4,345	2,994	0.22
License/permits/cooperative fees	31	21	a/
Depreciation	2,211	1,523	0.11
Interest on operating capital	2,103	1,449	0.10
TOTAL COSTS	38,085	26,241	1.89

a/ Less than 0.01

Table 29 . Average costs and returns of seaweed production, Tawi-Tawi, 2007

ITEM	PER HECTARE			PER FARM (P)	PER KILOGRAM (P)
	QUANTITY	UNIT	VALUE (P)		
Production	58,231	kg	255,723	66,672	4.39
Area harvested	0.26	ha			
Number of farms	50				
CASH COSTS			36,594	9,541	0.63
Seedlings	3,156.67	kg	21,005	5,477	0.36
Hired Labor	18.62	manday	2,301	600	0.04
Salaries of employees			345	90	0.01
Wage of caretaker			690	180	0.01
Rentals:					
Engine			15	4	a/
Fuel and oil			3,592	937	0.06
Transport cost of inputs			4,654	1,213	0.08
Supplies			2,661	694	0.05
Food expense			770	201	0.01
Repairs/improvements			560	146	0.01
NON-CASH COSTS			17,812	4,644	0.31
Seedlings (own produced)	3,445.87	kg	17,659	4,604	0.30
Harvesters' share	0.77	kg	4	1	a/
Other laborers' share	2.45	kg	12	3	a/
Supplies			138	36	a/
IMPUTED COSTS			24,625	6,420	0.42
Seedlings (received from others)	75.94	kg	621	162	0.01
Operator labor	63.65	manday	5,787	1,509	0.10
Family labor	50.07	manday	4,592	1,197	0.08
Exchange labor	0.21	manday	20	5	a/
Supplies			339	88	0.01
Depreciation			9,537	2,487	0.16
Interest on operating capital			3,729	972	0.06
TOTAL COSTS			79,031	20,605	1.36
GROSS RETURNS			255,723	66,672	4.39
RETURNS ABOVE CASH COSTS			219,129	57,131	3.76
RETURNS ABOVE CASH AND NON-CASH COSTS			201,317	52,487	3.46
NET RETURNS			176,692	46,067	3.03
NET PROFIT-COST RATIO			2.24	2.24	2.24

a/ Less than 0.01

Table 30 . Average variable and fixed costs of seaweed production, Tawi-Tawi, 2007
(peso)

ITEM	PER HECTARE	PER FARM	PER KILOGRAM
VARIABLE COSTS	65,765	17,146	1.13
Seedlings			
Purchased	21,005	5,477	0.36
Own produced	17,659	4,604	0.30
Received from others	621	162	0.01
Labor			
Hired Labor	2,301	600	0.04
Operator labor	5,787	1,509	0.10
Family labor	4,592	1,197	0.08
Exchange labor	20	5	a/
Salaries of employees	345	90	0.01
Wage of caretaker	690	180	0.01
Rentals:			
Engine	15	4	a/
Fuel and oil	3,592	937	0.06
Transport cost of inputs	4,654	1,213	0.08
Supplies	3,138	818	0.05
Food expense	770	201	0.01
Repairs/improvements	560	146	0.01
Harvesters' share	4	1	a/
Other laborers' share	12	3	a/
FIXED COSTS	13,266	3,459	0.23
Depreciation	9,537	2,487	0.16
Interest on operating capital	3,729	972	0.06
TOTAL COSTS	79,031	20,605	1.36

a/ Less than 0.01

Table 31 . Average costs and returns of seaweed production per hectare by major cost item,
selected provinces, Philippines, 2007
(pesos)

ITEM	PALAWAN	BOHOL	ZAMBOANGA SIBUGAY	MAGUINDANAO	TAWI-TAWI
Cash costs	20,071	24,195	12,751	17,584	36,594
Non-cash costs	24,896	21,436	6,604	8,671	17,812
Imputed costs	24,142	19,284	9,477	11,830	24,625
Total costs	69,109	64,915	28,832	38,085	79,031
Average yield (kg/ha)	39,387	33,988	19,812	20,180	58,231
Gross returns	208,374	131,354	86,140	60,540	255,723
Returns above cash costs	188,303	107,159	73,389	42,956	219,129
Returns above cash and non-cash costs	163,407	85,723	66,784	34,285	201,317
Net returns	139,265	66,439	57,307	22,455	176,692
Net profit-cost ratio	2.02	1.02	1.99	0.59	2.24
Cost per kilogram	1.75	1.91	1.46	1.89	1.36

Table 32 . Percentage distribution of seaweed produce by disposition item,
selected provinces, Philippines, 2007

DISPOSITION ITEM	ALL 5 PROVINCES	PALAWAN	BOHOL	ZAMBOANGA SIBUGAY	MAGUINDANAO	TAWI-TAWI
Sold	94.22	91.15	86.28	97.02	95.44	98.08
Harvesters' share	a/					a/
Other laborers' share	a/					a/
For home consumption	0.04	a/	0.10	a/	0.01	0.10
For seedlings	5.52	8.83	13.12	2.86	4.43	1.42
Given away	0.09		0.21	0.08	0.01	0.17
Wastage	0.13	0.02	0.29	0.04	0.10	0.22

a/ Less than 0.01

Table 33 . Percentage distribution of seaweed farm operators reporting on major buyers of produce,
selected provinces, Philippines, 2007

PROVINCE	AGENT	WHOLESALE	WHOLESALE- RETAILER	ASSEMBLER	PROCESSOR
All 5 Provinces	6.08	38.18	13.18	41.22	1.35
Palawan	8.45	66.20		25.35	
Bohol	4.00	9.33	14.67	70.67	1.33
Zamboanga Peninsula	6.00	68.00		26.00	
Maguindanao	2.00	2.00	14.00	76.00	6.00
Tawi-Tawi	10.00	48.00	42.00		

Table 34 . Percentage of seaweed farm operators reporting problems on production,
selected provinces, Philippines, 2007

PRODUCTION PROBLEM	ALL 5 PROVINCES	PALAWAN	BOHOL	ZAMBOANGA SIBUGAY	MAGUINDANAO	TAWI- TAWI
Presence of sea obstacles	28.38	23.94	20.00	4.00	20.00	80.00
High cost of seedlings and supplies	41.55	32.39	34.67	20.00	58.00	70.00
High cost of fuel and oil	33.11	39.44	34.67	2.00	18.00	68.00
Bad weather/natural calamities/strong waves	61.49	73.24	40.00	70.00	64.00	66.00
Lack of capital	55.74	33.80	45.33	60.00	80.00	74.00
Pollutants/siltation	14.53	2.82		4.00	2.00	76.00
Unavailability of good seedlings	18.24	12.68	18.67	10.00	16.00	36.00
Diseases like ice-ice, epiphytes, etc	84.46	88.73	77.33	92.00	70.00	96.00
Others a/	11.82	5.63	13.33	42.00		

a/ Include stealing of seaweeds, high humidity and illegal fishing (use of dynamite and sodium cyanide)

Table 35 . Percentage of seaweed farm operators reporting problems on marketing,
selected provinces, Philippines, 2007

MARKETING PROBLEM	ALL 5 PROVINCES	PALAWAN	BOHOL	ZAMBOANGA SIBUGAY	MAGUINDANAO	TAWI- TAWI
Unstable prices	61.82	76.06	66.67	28.00	44.00	86.00
Rough roads/high transport cost	6.08		1.33	8.00	24.00	2.00
Low price of produce	58.45	70.42	53.33	46.00	42.00	78.00
No buyer/market outlet	5.74	7.04	1.33	8.00	14.00	
Lack of marketing information	23.99	22.54	20.00	20.00	34.00	26.00
Others a/	2.03	2.82	5.33			

a/ Include price controlled by buyer, delayed payment by buyer and cannot sell directly to exporter

Table 36 . Percentage of seaweed farm operators who availed loans for seaweed production, selected provinces, Philippines, 2007

PROVINCE	PERCENT WHO AVAILED LOANS
All 5 Provinces	9.80
Palawan	12.68
Bohol	13.33
Zamboanga Sibugay	6.00
Maguindanao	12.00
Tawi-Tawi	2.00

Table 37 . Percentage distribution of seaweed farm operators who availed loans
by source, selected provinces, Philippines, 2007

PROVINCE	PRIVATE INDIVIDUAL	FARMERS ASSOCIATION	GOVERNMENT
All 5 Provinces	37.93	31.03	10.34
Palawan		100.00	
Bohol	20.00	60.00	20.00
Zamboanga Sibugay	66.67		33.33
Maguindanao	100.00		
Tawi-Tawi	100.00		

Table 38 . Percentage distribution of seaweed farm operators who availed
loans by amount borrowed, selected provinces,
Philippines, 2007

PROVINCE	P10,000 AND BELOW	P10,001 - P20,000	P20,001 - P30,000
All 5 Provinces	79.31	17.24	3.45
Palawan	100.00		
Bohol	70.00	20.00	10.00
Zamboanga Sibugay	66.67	33.33	
Maguindanao	66.67	33.33	
Tawi-Tawi	100.00		

Table 39 . Percentage distribution of seaweed farm operators who availed loans by interest rate, selected provinces, Philippines, 2007

PROVINCE	10% AND BELOW	11% - 20%	21% - 30%	> 30%	NO INTEREST
All 5 Provinces	41.38	10.34	3.45	10.34	34.48
Palawan	100.00				
Bohol	30.00	30.00		20.00	20.00
Zamboanga Sibugay			33.33	33.33	33.33
Maguindanao					100.00
Tawi-Tawi					100.00

Table 40 . Percentage of seaweed farm operators who are members of seaweed related associations, selected provinces, Philippines, 2007

PROVINCE	PERCENT WHO ARE MEMBERS
All 5 Provinces	24.32
Palawan	32.39
Bohol	22.67
Zamboanga Sibugay	4.00
Maguindanao	60.00
Tawi-Tawi	

Table 41 . Percentage of seaweed farm operators reporting on the benefits received from seaweed related association, selected provinces, Philippines, 2007

BENEFIT	ALL 5 PROVINCES	PALAWAN	BOHOL	ZAMBOANGA SIBUGAY	MAGUINDANAO	TAWI-TAWI
Financial assistance	31.94	39.13	64.71		10.00	
Technical assistance	13.89				33.33	
Medical assistance	2.78	8.70				
Seedlings dispersal	11.11	30.43			3.33	
Support on material inputs and supplies	9.72		11.76	50.00	13.33	
Free use of drying facility	6.94	21.74				
Access to market outlet	9.72				23.33	
Price stability	4.17				10.00	
Profit sharing	1.39				3.33	
Recipient of alternative livelihood program	6.94		23.53	50.00		

Table 42 . Percentage of seaweed farm operators who consulted/used
advice of extension agents, selected provinces,
Philippines, 2007

PROVINCE	GOVERNMENT EXTENSION AGENTS	PRIVATE EXTENSION AGENTS	DID NOT CONSULT
All 5 Provinces	20.27	3.72	77.36
Palawan	25.35	11.27	67.61
Bohol	8.00	1.33	92.00
Zamboanga Sibugay	4.00	4.00	92.00
Maguindanao	68.00		32.00
Tawi-Tawi			100.00

Table 43 . Percentage of seaweed farm operators reporting on the services availed from extension agents, selected provinces, Philippines, 2007

TYPE OF SERVICE	ALL 5 PROVINCES	PALAWAN	BOHOL	ZAMBOANGA SIBUGAY	MAGUINDANAO	TAWI-TAWI
Government extension agents						
Technical assistance	90.00	94.44	33.33	50.00	100.00	
Access to credit	1.67			50.00		
Survey/zoning of area	3.33		33.33			
Livelihood program	3.33		33.33			
Seedlings dispersal	6.67	22.22				
Private agents						
Technical assistance	90.91	100.00		100.00		
Environmental protection	9.09		100.00			

Table 44 . Percentage of seaweed farm operators reporting on the plan of operation,
selected provinces, Philippines, 2007

PROVINCE	MAINTAIN CURRENT OPERATION	EXPAND	NO RESPONSE
All 5 Provinces	53.72	41.55	4.73
Palawan	30.99	69.01	
Bohol	62.67	37.33	
Zamboanga Sibugay	58.00	42.00	
Maguindanao	62.00	30.00	8.00
Tawi-Tawi	60.00	20.00	20.00

Table 45 . Percentage of seaweed farm operators reporting on the recommendations to further improve the seaweed industry, selected provinces, Philippines, 2007

RECOMMENDATION	ALL 5 PROVINCES	PALAWAN	BOHOL	ZAMBOANGA SIBUGAY	MAGUINDANAO	TAWI-TAWI
Financial assistance	48.65	50.70	41.33	56.00	74.00	24.00
Technical assistance	8.78	18.31	6.67	8.00	6.00	2.00
Provide seaweed facilities a/	3.04	4.23	5.33	4.00		
Introduce high yielding/disease resistant variety	2.70	2.82	6.67	2.00		
Price support/stabilization of price	6.76	7.04	14.67		6.00	2.00
Market support	2.03		4.00	4.00		2.00
Organization of farmers cooperative and association	2.03		1.33	8.00		2.00
Introduce alternative livelihood program/projects	1.01		1.33	4.00		
Stoppage of illegal fishing (use of dynamite and cyanide)	4.73	12.68		10.00		
Others b/	8.45	8.45	16.00	6.00	8.00	

a/ solar dryer, mechanical dryer, processing plant and nursery

b/ Include provision of crop insurance/calamity fund, lower government tax, roll back price of gasoline, area expansion, elimination of usage of salt during drying, ban on the use of chemicals to treat seaweeds, and assistance to safeguard seaweeds from thieves



Department of Agriculture

BUREAU OF AGRICULTURAL STATISTICS

Agricultural Accounts and Statistical Indicators Division (AASID)

Fisheries Statistics Division (FSD)

Ben-Lor Bldg., 1184 Quezon Avenue, Quezon City

info@bas.gov.ph

<http://www.bas.gov.ph>