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CAMBODIA MSME 2/BEE BASELINE REPORT

FINAL DRAFT

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CAMBODIA MSME 2/BEE BASELINE REPORT

FINAL DRAFT

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ABBREVIATIONS

AI	Artificial Insemination
CEDAC	Cambodian Centre for Study and Development
DAI	Development Alternatives, Incorporated
DCED	Donor Committee for Enterprise Development
GIS	Geographic Information Systems
IRL	Indochina Research Limited
ISP	Input and Service Provider Enterprise
M&E	Monitoring and Evaluation
MSME 2/BEE	Micro Small and Medium Enterprise 2/ Business Enabling Environment
NTFP	Non Timber Forest Products
PMEP	Performance Monitoring and Evaluation Plan
SME	Small and Medium Enterprise
TAMIS	Technical and Administrative Management Information System
USAID	United States Agency for International Development
USG	United States Government
WSP	Water Service Provider

I. INTRODUCTION

Cambodia Micro Small and Medium Enterprise 2/ Business Enabling Environment (Cambodia MSME) project, implemented by DAI across 16 provinces in Cambodia, has interrelated mandates: to improve the ability of micro small and medium enterprises (MSMEs) to operate in Cambodia, while improving natural resource management, and access to safe water and sanitation. The project has main objectives: directly support the growth of enterprises and linkages in industry value chains, strengthen the ability of the private sector to advocate for itself, and strengthen the ability of the public sector to respond to private sector needs as well as the demands of the international trade regime. The program's underlying theory is that progress on all of these fronts will enable MSMEs to prosper, grow, and create jobs.

The project implements a range of activities under three components:

- Component One: Strengthen Selected Value Chains
- Component Two: Strengthen Private Sector Voice
- Component Three: Strengthen Public Sector to Improve the Business Environment

This report presents results from a baseline survey of enterprises assisted under Component One: Strengthen Selected Value Chains. Data was gathered for each project-assisted value chain in accordance with indicators listed in the project Performance Monitoring and Evaluation Plan (PMEP).¹ As of this report's preparation, baseline surveys have been conducted for five value chains that include pigs, fish, brick and tile, wild honey bee, and water supply services. Cambodia MSME is currently expanding activities to include resin and tourism value chains, with a potential to include other value chains, such as fruit. Baseline data for enterprises in these value chains will be gathered and reported separately.

This report presents a summary of results from baseline studies conducted by Cambodia MSME partners for project-assisted value chains. Indochina Research Limited (IRL) focused on pigs, fish, and brick and tile; Crossroads to Development focused on wild honey bees; and KOSAN Engineering concentrated on water supply services.

The report is structured as follows: following the Introduction, Section II provides an overview of the Cambodia MSME performance monitoring and evaluation system, and explains the context for the baseline study; Section III discusses the baseline study objectives and methodology; Section IV is organized by measured performance indicators, and presents brief backgrounds and baseline survey results for the value chains.

The purpose of this report is to summarize enterprise performance prior to project intervention, against key indicators. Although introductory background is provided for each value chain to orient the reader, the report does not include a detailed description of production processes and productivity challenges that have been covered by other project studies. These studies are referenced throughout the report and should be consulted for further detail on the value chains.

¹ Cambodia MSME/BEE Annual Performance Monitoring and Evaluation Plan Year 1, DAI, December 2008; Revised Draft, November 2009

II. CAMBODIA MSME PERFORMANCE MONITORING AND EVALUATION PLAN AND INDICATORS

The Cambodia MSME PMEP provides detailed information on indicators that assess project performance. The Cambodia MSME team, in collaboration with IRL and USAID/Cambodia, developed the PMEP.

The PMEP includes performance indicators, and lays out a conceptual framework through causal models for each project component. The tables below show the causal model and indicators for activities related to Component One: Strengthen Selected Value Chains. In accordance with the PMEP, the Cambodia MSME team monitors the progress of activities and outputs on a regular basis, and will later evaluate outcomes and impacts.

In addition to performance monitoring tools, the Cambodia MSME monitoring and evaluation system contains an impact assessment component. The project conducts a longitudinal study, using survey tools to track and evaluate changes in project-assisted enterprises over time against performance indicators. Impact assessment activities involve a baseline survey of project-assisted enterprises (or producer households, where appropriate) conducted at the beginning of the project, and follow-up surveys of the same respondents to be conducted at mid- and end-points of the project.

Following this methodology, baseline surveys were conducted for project-assisted value chains during Cambodia MSME's Year 1. Results are summarized in this report.

COMPONENT 1: STRENGTHEN SELECTED VALUE CHAINS

Activities	Outputs	Outcomes	Impacts	Program element/sub-element
Broaden activities to include more enterprises	Expanded work into new geographic areas and value chains, including NTFP and water.	Increased, productivity, volume, quality, sales and incomes in selected value chains; Increased investment	Greater sustainability, growth, income and job creation in MSMEs in selected value chains through expanded sales in domestic and foreign markets	Private sector productivity; Strengthen microenterprise productivity
Facilitate horizontal and vertical linkages to upgrade Cambodia MSME competitiveness, build business relationships, and increase market access	Improved access to domestic and international markets			
Develop a common vision of integrated conservation and development in targeted CFIs	Improved local and regional conservation awareness	Increased land area under improved natural resource management; Increased economic benefits derived from Non Timber Forest Products (NTFP)	Improved sustainability of natural resources management and production	Sustainable natural resources management and production
Support local and regional planning efforts that integrate sustainable development with sound biodiversity conservation practices	Improved local and regional conservation practices			
Assess existing private Water Service Providers (WSPs)	Increased private sector investment in water supply and sanitation businesses	Improved productivity and efficiency of WSPs	Improved access to safe water	Safe water access and piped water
Conduct value chain assessments on sanitary latrines	Strengthened linkages in sanitary latrine value chain	Improved productivity and efficiency of latrine providers	Improved access to basic sanitation	Basic sanitation

COMPONENT I: STRENGTHEN SELECTED VALUE CHAINS

Indicator	Unit	Definition	Source	Collection Method	Frequency	4 year target	Base-line	Y1 target	Y2 target	Y 3 target	Y4 target	+2*
Number of enterprises benefiting from USAID development assistance*/**	No.	Total number of firms assisted (by value chain)	MSME 2/BEE	Client profile/ Survey	Annual/ biannual	6,000	TBD	3,000	4,000 (cumulative)	5,000 (cumulative)	6,000 (cumulative)	--
Number of provinces supported by MSME 2/BEE	No.	Total number of provinces assisted by MSME 2/BEE	MSME 2/BEE	Project records	Annual	12	6	12	12	12	12	--
Percentage change in value of sales of project-assisted enterprises*	%	Percentage increase in sales of direct beneficiaries (disaggregated by sex of head of enterprise)	MSME 2/BEE	Client profile/ Survey	Annual/ biannual	75%	TBD	10%	30%	15%	20%	22%
Percentage change in income of project-assisted enterprises	%	Percentage increase in incomes of direct beneficiaries (disaggregated by sex of head of enterprise)	MSME 2/BEE	Client profile/ Survey	Annual/ biannual	100%	TBD	15%	20%	30%	35%	25%
Percentage change in investments by project-supported SMEs	%	Percentage increase in investments by direct beneficiaries (disaggregated by sex of head of enterprise)	MSME 2/BEE	Client profile/ Survey	Annual/ biannual	100%	TBD	15%	20%	30%	35%	25%
Number of people with increased economic benefits derived from sustainable natural management and conservation	No.	The number of people engaged in forest management that derive improved incomes from NTFP value chains supported by MSME2 (1-men; 2-women)	MSME 2/BEE	Project records/ Client profile/ Survey	Annual/ biannual	1-5,000; 2-2,000	TBD	1-800; 2-200	1-4,200; 2-1,800			1-5,000; 2-2,000
Number of people receiving USG-supported training in natural resources management and/or biodiversity	No.	Number of people that are trained in improved forest management and sustainable harvesting of NTFPs (1-men; 2-women)	MSME 2/BEE	Project records/ Client profile/ Survey	Annual/ biannual	1-900; 2-300	TBD	1-400; 2-100	1-500; 2-200			1-900; 2-300

Indicator	Unit	Definition	Source	Collection Method	Frequency	4 year target	Base-line	Y1 target	Y2 target	Y3 target	Y4 target	+2*
conservation												
Number of hectares in areas of biological significance under improved natural resource management**	Hectare (HA)	Area of priority forest ecosystems that are managed sustainably by community groups supported by MSME2	MSME 2/BEE	Survey/ Geographic information system (GIS)	Biannual	75,000	TBD	25,000	75,000 (cumulative)	0	0	75,000
Number of private sector water service providers	No.	Increased number of private sector firms providing water (disaggregated by sex of head of enterprise)	MSME 2/BEE	Project records	Annual	26	TBD	3	26 (cumulative)	0	0	0
Number of people with improved access to drinking water as a result of USG assistance**	No.	Increased number of individuals connected to piped water, disaggregated by municipality/province	MSME 2/BEE	Project records/ Survey	Semi-annual/ biannual	75,000	TBD	10,000	50,000 (cumulative)	75,000 (cumulative)	0	75,000
Sales of point of use latrines	No.	Number of latrines sold with support from MSME 2/BEE disaggregated by municipality/province	MSME 2/BEE	Project records	Annual	5,000	TBD	2,500	2,500	0	0	0

* DCED indicator/requirement ** Operational Plan Indicator

III. BASELINE STUDY OBJECTIVES AND METHODOLOGY

Cambodia MSME Component One strengthens selected value chains through activities that increase enterprise productivity and income. The objective of this report is to summarize the results of several baseline studies conducted for project-assisted value chains during the first year of the project. These studies used survey instruments and other data-gathering tools, such as focus group discussions where appropriate, to collect data on enterprise-level indicators established in the Cambodia MSME PEMP. These indicators include:

- Percent change in investments by project-assisted enterprises.
- Percent change in volume of production of project-assisted enterprises.
- Percent change in value of sales of project-assisted enterprises.
- Percent change in income of project-assisted enterprises.
- Number of full-time equivalent jobs created.

In each value chain, a sample of project-assisted enterprises or households was surveyed using instruments specific to that value chain. A sample was drawn from one or several types of value chain actors with which the project engages.

Additionally, the number and types of enterprises surveyed varied between value chains. For example, the survey for the pig value chain included pig producers, pig traders, pig input and service providers. In the fish value chain, the sample included two value chain actors: fish producers, and fish traders. In the brick and tile value chain, and the water supply services value chain, only one actor was surveyed: the brick and tile makers, or the water service providers, respectively. In the wild honey bee value chain, households involved in honey bee harvesting were surveyed. Survey questionnaires were tailored for each of these value chain actors.

Sampling methodology differed for each value chain and is discussed in detail below. To ensure uniform data analysis, however, interpretation guidelines were created. For all indicators, unless otherwise noted, the following definitions were used throughout the report.

- **Investment** is measured in U.S. dollars and includes assets such as equipment, infrastructure, inventory, transportation assets, etc.
- **Volume of production** is measured in units specific to products in each value chain.
- **Value of sales** is measured in U.S. dollars on either a daily or annual basis.

- **Income** is defined as the value of annual sales minus the annual cost of business. Although not a separate PMEPE indicator, cost of business was calculated when possible for assisted enterprises to determine income, and included such operational costs as labor, energy, and production costs.
- **Full-time equivalent jobs** are measured in number of jobs per enterprise, where all full-time jobs and 50% of all part-time jobs are counted towards the indicator.

Where appropriate, data on other productivity indicators specific to enterprises in particular value chains was included.

METHODOLOGY FOR PIG, FISH AND BRICK AND TILE VALUE CHAINS

In July, 2009, Cambodia MSME had a total of 2,380 active clients in the pig, fish and brick and tile value chains. By October 2009 this number increased to 2,727. For IRL's baseline survey of the three aforementioned value chains, enterprises in 40 districts in 12 provinces were randomly selected, with a geographic distribution similar to that of all Cambodia MSME chain clients. The parent sampling frame was the Cambodia MSME TAMIS² Client List of Value Chain Enterprises, dated July 2009. For the purposes of the baseline study, this set of clients was filtered to select only recently joined enterprises that had not yet benefited substantially from project interventions.³

The 40 Cambodia MSME districts sampled were selected proportionally to the number of Cambodia MSME clients in each of these districts and contained 78% or more of the recent Cambodia MSME clients in the three value chains. Proportional quotas were set for each district for numerous producer clients in each value chain, and enterprises were randomly sampled to fill the quotas for each district. For other low frequency value chain actors, including input suppliers and traders, attempts were made to interview as many as possible of these types of enterprises. Data collection took the form of face to face interviews with Cambodia MSME enterprise owners, using a standard survey questionnaire designed by IRL and the Cambodia MSME team. Further background checks with enterprises were conducted where necessary, following completion of interviews and preliminary data analysis.

Cambodia MSME enterprises generally consist of a mixture of a numerical majority of small-scale enterprises, and a minority of much larger-scale enterprises. Larger enterprises, while few in number, affect the overall sample mean for all types of value chain actors. Therefore, the median, which gives a better indication of the profiles of more typical small scale enterprises, is also included in the main results, and Appendix B Tables. Project indicator results are based on the mean for all Cambodia MSME enterprises.

The PMEPE states that indicator measurements should be disaggregated by sex where appropriate and feasible. At this baseline stage, for all value chain actor types, researchers report proportions of enterprises owned by women versus men, and enumerate male and female proportions of the enterprise labor force. Beyond that, the sample of female-headed enterprises by value chain actor type is too small in most cases to conduct further gender disaggregation of PMEPE indicator results. As Cambodia MSME

² Technical and Administrative Management Information System.

³ The TAMIS Client List for July was subsequently found to contain some errors in client information during field work, with some affect on quota achievement and representativeness. Corrected Client List data is included in the demographic tables in this report.

continues active recruitment of these actors, however, a more detailed analysis of female client growth will become feasible.

METHODOLOGY FOR WILD HONEY BEE VALUE CHAIN

In August 2009, Cambodia MSME commissioned Crossroads To Development to conduct a baseline survey of honey-hunting communities in the Srea Ambel and Botum Sakor districts in the Koh Kong Province. The study areas in the 2 districts and 5 communes comprised 10 villages, with a total household population of 1,800. The baseline survey sampled 120 households involved in honey harvesting, which included 72 project participants and 48 non-participant households as a control area. This baseline summary report analyzes only the data for project participants, and will be compared to data collected during the mid- and end-line surveys of the same households.

Several data collection methods were used: household surveys using structured questionnaires; focus group discussions; key informant interviews with respondents, including honey hunters, collectors, traditional medicine sellers, a honey-wine maker, government agencies and NGOs; and ecological walks in distinct ecosystems within the study area.

METHODOLOGY FOR WATER SUPPLY SERVICES VALUE CHAIN

In May 2009, Cambodia MSME contracted KOSAN Engineering to conduct a rapid assessment of private WSPs with the greatest potential for expansion, located within the 12 provinces targeted by the project at that time.⁴ As a result, 35 WSPs have been identified as a target for project assistance and formed the sample for an in-depth survey. The data gathered during this survey is the baseline against which the progress of project-assisted private WSPs will be measured at mid- and end points of the project. The baseline study focused on WSPs as the key actor in the water supply services value chain, and the main point of project intervention.

WSPs vary in size depending on the number of household connections, and survey data varied widely depending on the size of the WSP. To address this challenge, WSPs surveyed have been categorized into three groups: small, medium, and large. Additionally, responses were analyzed and presented for each group separately, to ensure accuracy. The PMEP indicators for this value chain are presented as total and median (average) values.

⁴ Initial Assessment of Existing Private Water Service Providers in Cambodia, KOSAN Engineering for Cambodia MSME project, May 2009.

IV. BASELINE STUDY RESULTS

1. PIG VALUE CHAIN

METHODOLOGY

The pig value chain has been selected as the major target for Cambodia MSME project support. In July 2009 this chain had 1,945 pig enterprises, representing 82% of all enterprise clients in Component One-supported value chains. By October 2009, the number of enterprises grew to 2,226. This larger client base reflects the proportion of rural Cambodian households engaged in pig production. Updated TAMIS client data for July 2009 shows that 24% of these enterprises were owned by women and 76% by men.

Pig enterprises in 40 districts and 11 provinces were randomly selected for this survey, with geographic distribution similar to all Cambodia MSME pig value chain clients. This sample yielded results for 555 pig producer enterprises, 57 pig input and service-provider enterprises (including veterinarians) and 7 pig trader enterprises. This total encompasses 8% of entrepreneurs who run multi-role enterprises, including those engaged in pig production that also operate as pig input and service providers, or traders.

The study focused on households involved in pig production as the main Cambodia MSME actor in the value chain. A good sample of pig veterinarians were also included in the sample in proportion to the number of CAMBODIA MSME enterprises. A limited number of Cambodia MSME pig traders and pig input and service providers are also included. Information on pig value chain actors, including pig product processors, wholesalers and retailers were beyond the scope of the study, as no enterprises fit baseline criteria in July 2009—listed in TAMIS as active, within the 40 sample districts, and joined the project within the last six months.

1.1 PIG PRODUCERS

Demographic profile

30% of the 555 Cambodia MSME sample pig producer enterprises are owned by women, and 70% are owned by men. They are located in key rural areas, mainly in the Plains and Tonle Sap regions. Pig producers were sampled in 11 provinces, with most in the five provinces of Battambang, Kampong Thom, Prey Veng, Pursat and Siem Reap.

TABLE 1: CAMBODIA MSME SAMPLE PIG PRODUCER LOCATION PROFILE

Location	Sample	(Recent	clients	only)	TAMIS	(All	MSME	clients)
	(n)	% total	No. F	% F	No.	% total	No. F	% F
Rural/Urban								
% Rural	547	99%	167	99%				
% Urban	8	1%	2	1%				
Region								
Coastal	31	6%	11	7%				
Plateau/ Mountain	13	2%	3	2%				
Plains	184	33%	37	22%				

Location	Sample	(Recent	clients	only)	TAMIS	(All	MSME	clients)
	(n)	% total	No. F	% F	No.	% total	No. F	% F
Tonle Sap	327	59%	118	70%				
Provinces								
Banteay MC	0	0%	0	0%	0	0%	0	0%
Battambang	72	13%	21	12%	124	8%	35	9%
Kampong Cham	12	2%	2	1%	55	3%	8	2%
Kampong Speu	12	2%	2	1%	115	7%	24	6%
Kampong Thom	81	15%	35	21%	151	9%	52	13%
Kampot	31	6%	12	7%	195	12%	46	12%
Kandal	1	0%	0	0%	25	2%	2	1%
Kratie	0	0%	0	0%	108	7%	28	7%
Phnom Penh	0	0%	0	0%	6	0%	0	0%
Prey Veng	84	15%	18	11%	239	15%	51	13%
Pursat	81	15%	32	19%	167	10%	50	13%
Siem Reap	94	17%	31	18%	172	11%	53	14%
Svay Rieng	35	6%	3	2%	101	6%	13	3%
Takeo	52	9%	14	8%	152	9%	27	7%
Total Sample	555	100%	169	100%	1610	100%	389	100%

Demographic data on Cambodia MSME households was collected using a standard USAID Poverty Assessment Tool. Among pig producer households, 89% of household heads are male, with a mean age of 44 years, and an average household size of 5.3 persons. These households have an average of two adults with at least very basic literacy. On average, these households were associated with the Cambodia MSME project for three to four months at the time of the Baseline Survey.

TABLE 2: CAMBODIA MSME SAMPLE PIG PRODUCER DEMOGRAPHIC PROFILE

Enterprise Household Profile	Sample (n)	% of Enterprises
Demographics		
Male	495	89%
Female	60	11%
Mean household size (persons)	5.2	
Mean Age of household head	43.7	
No pers. >=18 yrs can read simple message	2.1	
Mean months in Cambodia MSME project	3.4	
Total Sample	555	100%

While the great majority of Cambodia MSME pig production household heads are male rather than female, 30% of Cambodia MSME sample pig enterprises are owned and operated by females in the household who are daughters or other relatives of a male household head. Gender-based pig production labor data presented later in this report also indicates that, on average, an equal number of men and women work within the pig production enterprise.

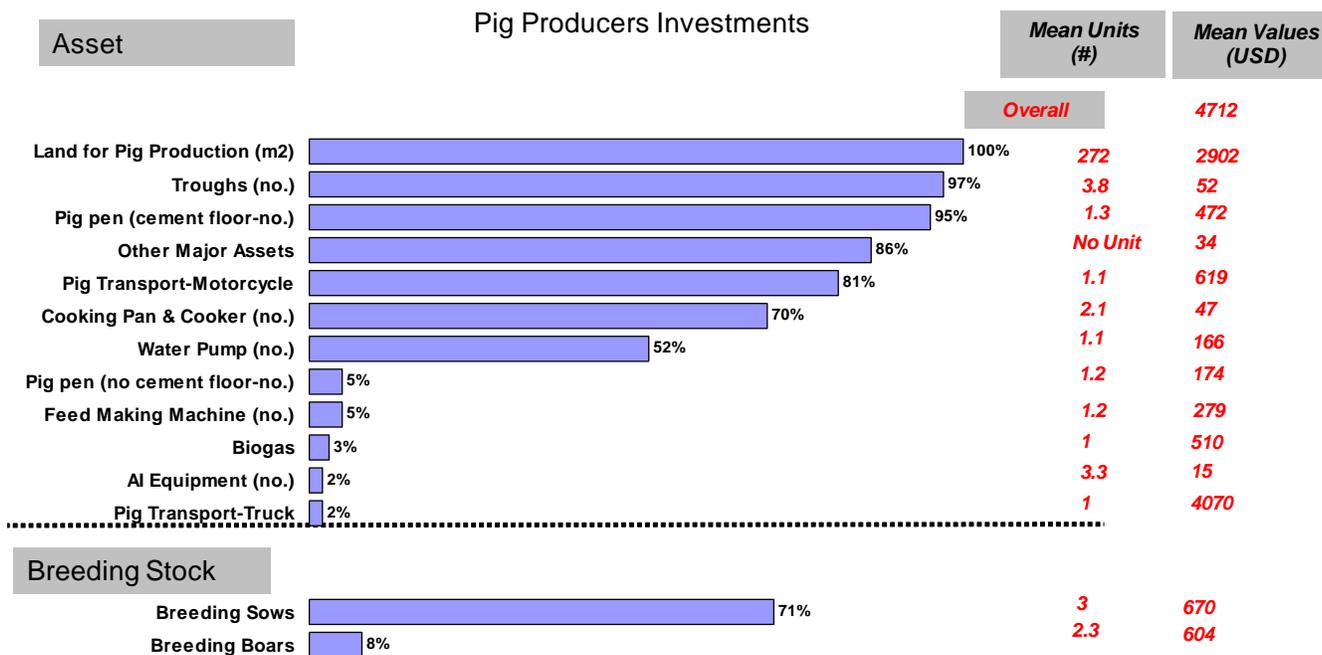
1.1.1 Value of investments by project-assisted enterprises

Pig producer investments consist of various assets and breeding stock, as listed in Figure 1. All enterprises have invested in land-for-pig production, with a mean area of 272 m² valued at \$2,902, including larger enterprises, and more typically a median of 50m² valued at \$239. The vast majority of enterprises have also invested in basic assets, including pig pens, troughs and motorcycles.

The proportions of enterprises with investments in other basic assets are lower, including only 70% with cooking pan and cookers, and 52% with water pumps. Very few enterprises have invested in feed-making machines (5%), Artificial Insemination (AI) equipment (2%), or biogas (3%). Investments in these types of assets increase enterprise productivity. Cambodia MSME will seek to increase these investments.

Investment in breeding stock is most commonly for breeding sows (71% of enterprises) and only rarely for breeding boars. Each Enterprise owns a mean of three breeding sows, valued at \$670. **The baseline mean value of total investments is \$4,712 per Cambodia MSME pig producer enterprise.**

FIGURE 1: PIG PRODUCERS INVESTMENTS



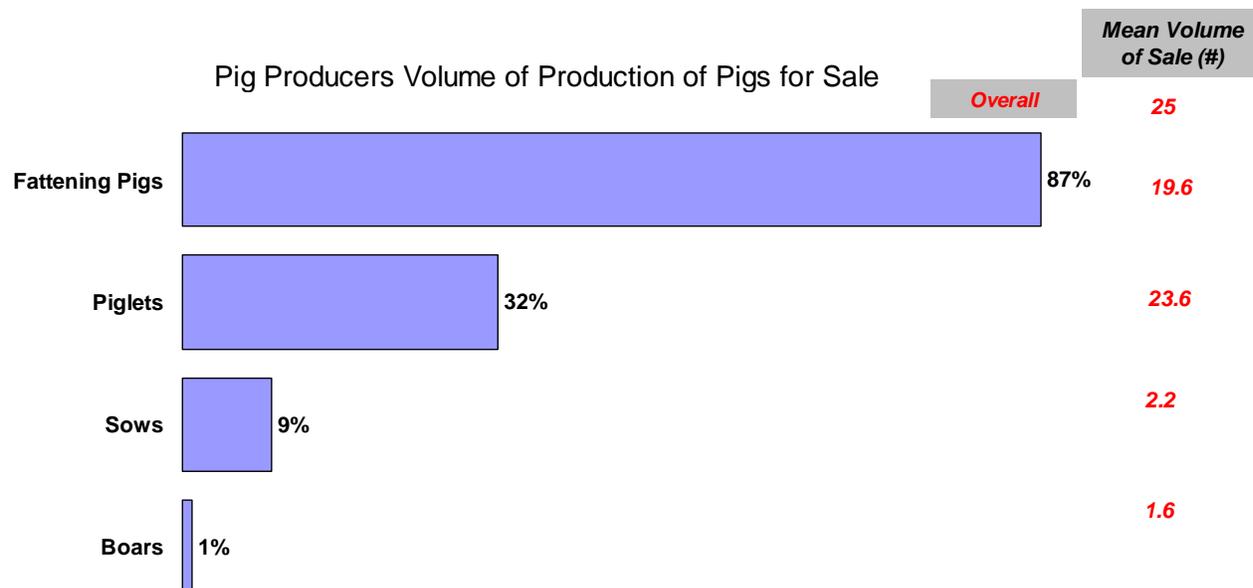
1.1.2 Volume of production of project-assisted enterprises

Pig enterprises typically produce a combination of piglets and feeder pigs, and sometimes boars and sows, and there are different volumes of production for each of these types. The definition of “volume of production” in the PMEP is the mean total number of pigs of all types produced for sale per enterprise. This definition links directly to the companion PMEP indicator “value of sales” reported in the next section. **The baseline mean volume of production is 25 pig head per Cambodia MSME pig producer enterprise.**

The breakdown of the total volume of pig production for sale by type of pig is shown in Figure 2. Fattening pigs are produced and sold by 87% of enterprises, with a mean of 19.6 sold. Piglets are

produced and sold while still piglets by 32% of enterprises, with a mean of 23.6 sold. Sows and boars are rarely produced for sale, being retained for breeding stock. From this breakdown, the mean of 25 head produced for sale among all 555 pig enterprises is derived.

FIGURE 2: PIG PRODUCER VOLUME OF PRODUCTION OF PIGS FOR SALE



The baseline survey also asked respondents about total pig production in their enterprise, including all pigs bred and bought rather than only those pigs sold. Table 3 shows these results. Almost all enterprises (97%) bred or bought piglets, with a mean of 25 head per enterprise. As shown in the above Figure 2 on sales, these piglets are most commonly raised as fattening pigs for sale, while about one third will be sold off as piglets. In addition, 24% of enterprises had fattening pigs on hand in the weight gain stage before sale, a mean of 19 head among these enterprises. The sows and boars in production are most likely to be younger pigs retained and being raised to replace existing breeding stock.

TABLE 3: PIG PRODUCER TOTAL VOLUME OF PRODUCTION

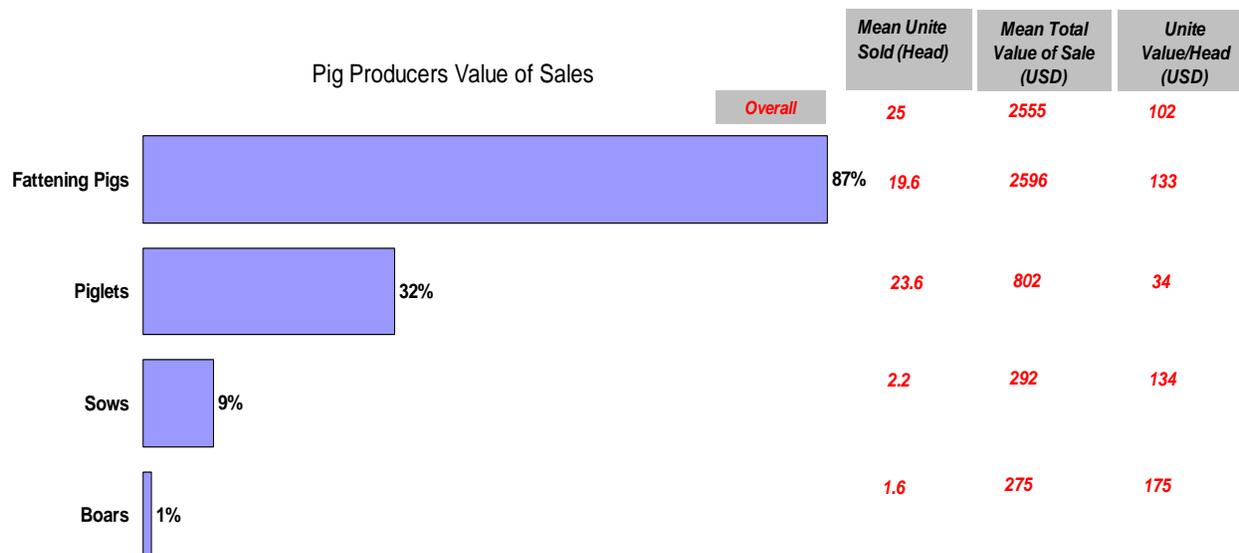
Item	Sample (n)	% Total	Units	
			Mean	Median
Boars	16	3%	1.9	1
Sows	119	21%	2.6	2
Fattening Pigs (Fattening)	132	24%	19.1	9
Piglets (to Fattening Pigs)	540	97%	25.5	17
Total Sample/ Value	555	100%	30	20

1.1.3 Value of Sales of project-assisted enterprises

The breakdown of the total value of sales per pig enterprise is shown in Figure 3. For reference, the volumes of sales, discussed in the previous section, are also included in the table. The overall mean value of pig sales for all 555 enterprises is calculated based on different frequencies of enterprises selling each pig type and mean values for the sale of different pig types. Overall, among all pig producers, fattened pig

sales are the most common and important, with piglet sales as a secondary source of revenues. The value of sales is shown in the figure first as the total mean per enterprise, and then as unit value per head sold. **The baseline mean value of sales is \$2,555 per Cambodia MSME pig producer enterprise.**

FIGURE 3: PIG PRODUCER VALUE OF SALES



1.1.4 Cost of business and Income of project-assisted enterprises

The value of sales indicator shows enterprise gross sales revenues. This section examines costs of business for pig production in order to determine the PMEP Indicator of pig enterprise income. Income is defined as the value of annual sales minus the annual cost of business.

Cost of Business

The costs of business for pig production include costs of bought stock and costs of goods and services used during pig production cycles. **The mean overall cost of business for pig enterprises is \$1,775 per enterprise.**

Figure 4 below shows the baseline cost of business results. While pig enterprises universally breed pigs for sale, some enterprises also buy stock to supplement production. Among all 555 pig enterprises, the mean total cost of stock was \$414 per enterprise, representing 23% of all costs of business. In particular, 50% of enterprises bought a mean of 14 piglets per enterprise for fattening at a total cost of \$484. A minority of 15% of enterprises bought a mean of 18 head of feeder pigs for further fattening and sale, and 10% bought sows.

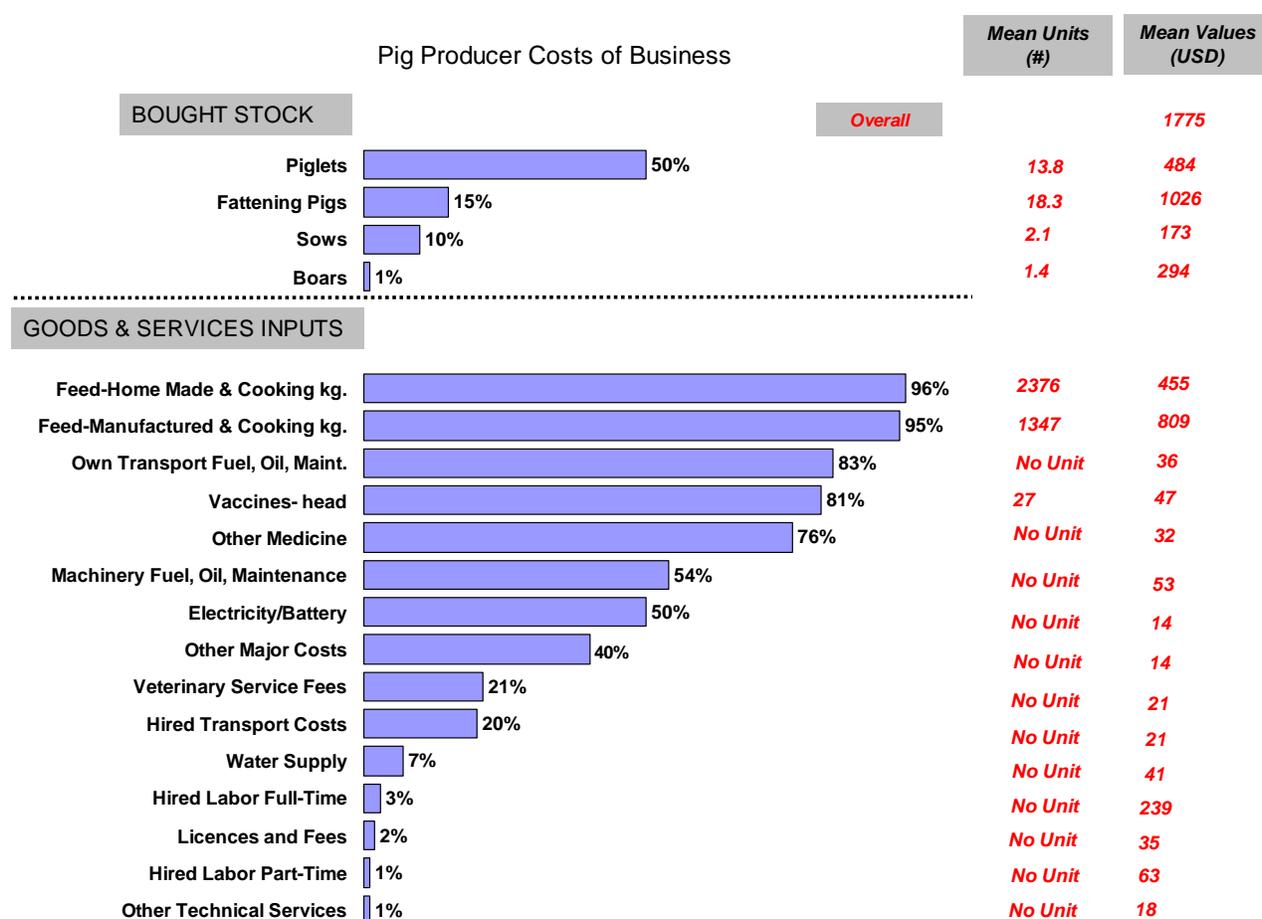
Pig production costs include expenditures for a range of goods and services. Among all 555 pig enterprises, the mean total cost of these goods and services was \$1,361 per enterprise, representing 77% of total costs of business⁵. By far, the most common and largest cost of business for producers was pig

⁵ Enumeration goods and services costs were based on respondent recall over the last one year, as enterprises do not keep records. Enumeration of larger and more common types of goods and services costs was based on unit values and volumes.

feed costs. Feed costs include the cost of buying feed and the cost of cooking feed for pig consumption. Manufactured feed costs were incurred by 95% of enterprises at a mean value of \$809 and home-made feed costs by 96% of enterprises, at a mean of \$455. The total mean cost of pig feed of both types represents an average of 68% of total business costs for all pig enterprises.

Other very common costs of goods and services among enterprises included vaccine costs (81% of enterprise; mean \$47), other medicines (76% of enterprises; mean \$12), and own transport costs (83% of enterprises; mean \$19). Around 50% of enterprises had limited energy-related costs, including machinery fuel and maintenance (\$24), and electricity (\$5). Further important baseline findings here include a lack of utilization of some services among pig producers. Only 3% of enterprises use any form of hired labor, only 1% utilize other technical services beyond veterinarians, and only 20% use hired transport services.

FIGURE 4: PIG PRODUCER COSTS OF BUSINESS



Enumerating feed quantities and cost estimates is complicated for some producers, especially in relation to home-made feed and cooking costs. Assuming the average of 25 pigs sold per enterprise, each pig on average would consume 149 kg of supplementary feed (manufactured or home-made) over its growth

Less common and/or smaller costs were estimated as total costs. Respondent recall over the last one year has its limitations as a method and the values should be treated as best estimates.

cycle from piglet to sale live-weight. This supplementary feed quantity appears low in relation to optimal live-weight gain in pig production.

Income

Income is defined as the value of annual sales minus the annual cost of business. Table 4 below shows the baseline income results derived from subtracting cost of business from total value of sales. **The baseline mean value of income is \$780 per Cambodia MSME pig-producer enterprise.**

TABLE 4: PIG PRODUCER INCOME

Item	Sample (n)	% Total	Values (\$)	
			Mean	Median
TOTAL VALUE OF SALES	555	100%	\$2,555	\$1,382
TOTAL COST OF BUSINESS	555	100%	\$1,775	\$1,020
TOTAL SAMPLE / INCOME	555	100%	\$ 780	\$ 312

1.1.5 Other productivity indicators for project-assisted enterprises

The baseline survey included pig-productivity indicators that were considered important but are not included in the PMEP indicator matrix. There are two indicators: feeder pig productivity, and pig mortality. Table 5 illustrates two productivity indicators related to feeder pigs. The average feeder pig weight at sale is 66 kilograms live weight. A potential impact of the Cambodia MSME project will be to increase this average live weight at sale to the 70-90 kg range. The average number of days to raise a feeder pig to 80-90 kilograms live weight is 157 days, or just over five months. A further potential impact of the Cambodia MSME project will be to reduce this average number of days to 120 days, or four months.

TABLE 5: CAMBODIA MSME PIG PRODUCTIVITY INDICATORS: FEEDER PIGS

Item	Sample (n)	% Total	Units	
			Mean	Median
AVG. FEEDER KG AT SALE	555	100%	66	73
AVG. DAYS FEEDER TO 80-90KG	501	90%	157	150
Total Sample/ Value	555	100%		

Table 6 shows productivity indicators in terms of pig mortality, by type of pig. The number of such enterprises reporting that one or more head died by type is shown in the first column. The reported mortality rates are presented at the enterprise level as the percentage of each pig type reported died as a proportion of all pigs of that type produced by the enterprise. No enterprises reported mortality among boars and only 1% had mortality among sows. Six percent of enterprises reported deaths of fattening pigs with a mean of 28% dying among those enterprises. Forty-six percent of pig enterprises reported piglet mortality with a mean of 21% of piglets dying among those enterprises.

Overall, the percentage of enterprises reporting mortality seems low and may be under-enumerated, particularly in the case of piglet mortality. One possible explanation is found in the cost-of-business data, which shows 83% of producers vaccinate their pigs, with an average of 27 heads vaccinated per

enterprise, covering the mean volume of production of 25 pigs sold per enterprise, per year. In addition, 76% of enterprises are buying other medicines for pig treatment. These practices will reduce pig mortality. A second possible explanation is that piglets or feeders that are at risk of dying may be sold for slaughter prior to death. The prevalence of this practice deserves further research in the context of the Pig Influenza risks associated with such practices.

TABLE 6: PIG PRODUCTIVITY INDICATORS: PIG MORTALITY

MORTALITY RATE: PIG PRODUCTION			Units	
Item	Sample (n)	% Total	Mean	Median
Boars	0	0%	0.0	0.0
Sows	8	1%	76%	100%
Fattening Pigs	35	6%	28%	17%
Piglets	255	46%	21%	15%
Total Sample/ Value	555	100%		

1.1.6 Number of full-time equivalent jobs of project-assisted enterprises

The pig enterprise labor force is overwhelmingly family rather than hired labor. Typically, an equivalent number of men and women are engaged in pig production in each enterprise. This is an important dimension of gender equity among Cambodia MSME -assisted pig enterprises. In accordance with the project methodology, the number of full-time equivalent jobs is measured as full-time jobs, and 50% of all part-time jobs combined. **The baseline number of full-time equivalent jobs per Cambodia MSME pig producer enterprise is 2.5 jobs per enterprise.**

TABLE 7: PIG PRODUCER LABOR

Item	Sample (n)	% Total	Units	
			Mean	Median
FAMILY LABOR				
Male-Full Time	523	94%	1.3	1.0
Female-Full Time	529	95%	1.3	1.0
HIRED LABOR				
Male-Full Time	16	3%	1.4	1.0
Female-Full Time	10	2%	1.1	1.0
Total Sample/ Value	555	100%	2.5	2.0

1.2 PIG TRADERS

Pig trader enterprises are those that trade pigs for profit. Pigs are purchased from producers and transported and sold to other pig producers, processors, wholesalers, or retailers. Updated TAMIS client data for all traders in July 2009 shows a total of four traders, including one female-owned enterprise.

Demographic profile

A limited sample of seven pig traders who joined the Cambodia MSME project within the last six months is included in this pig value chain baseline. All are owned by men. These traders are from multi-role

enterprises that are also pig producers (and are recorded in TAMIS as such). All traders are located in rural areas, and mostly within the Tonle Sap region. The traders are located in the four provinces of Kampong Thom, Pursat, Siem Reap, and Takeo. All trader enterprises are owned by men rather than women.

TABLE 8: PIG TRADER LOCATION PROFILE

	Sample	(Recent	clients	only)	TAMIS	(All	MSME	clients)
Location	(n)	% total	No. F	% F	No.	% total	No. F	% F
Rural/Urban								
% Rural	7	100%	0	0%				
Region								
Plains	2	29%	0	0%				
Tonle Sap	5	71%	0	0%				
Province								
Kampong Thom	1	14%	0	0%	0	0%	0	0%
Kampot	0	0%	0	0%	1	33%	1	100%
Prey Veng	0	0%	0	0%	1	33%	0	0%
Pursat	2	29%	0	0%	0	0%	0	0%
Siem Reap	2	29%	0	0%	0	0%	0	0%
Svay Rieng					1	33%	0	0%
Takeo	2	29%	0	0%	0	0%	0	0%
Total Sample	7	100%	0	0%	3	100%	1	100%

Pig Trader households are all male-headed with a mean age of 36 years and an average household size of 5.3 persons. These households have an average of 0.9 adults who have at least very basic literacy. Compared to pig producer households heads and families are younger, but of the same household size. On average these households were with Cambodia MSME project for 3.7 months at the time of the baseline survey.

TABLE 9: PIG TRADER DEMOGRAPHIC PROFILE

Enterprise Household Profile	Sample (n)	% of enterprises
Demographics		
Male	7	100%
Mean household size (persons)	5.3	
Mean Age of household head	36.1	
No. pers. >=18 yrs can read simple message	0.9	
Mean Months in Cambodia MSME Project	3.7	
Total Sample	7	100%

1.2.1 Value of investments by project-assisted enterprises

As illustrated in

Table 10, the major type of investment is motorcycle transport for pigs. No traders owned trucks for transport and there was little investment in other assets by these enterprises. **The baseline-mean value of total investment per Cambodia MSME pig trader enterprise is \$580.**

TABLE 10: PIG TRADER INVESTMENTS

INVESTMENTS: PIG TRADERS	Sample (n)	% Total	Units		Value (\$)	
			Mean	Median	Mean	Median
Pig Transport-Motorcycle	7	100%	1	1	\$ 547	\$ 479
Pig Transport-Truck	0	0%	0	0	\$ -	\$ -
Other Major Trading Assets	7	100%	No Unit	No Unit	\$ 32	\$ 17
Total Sample/ Value	7	100%			\$ 580	\$ 503

1.2.2 Volume of production of project-assisted enterprises

Pig-trader enterprises do not themselves produce pigs for sale but instead trade pigs. For pig traders, the PMEP indicator “Percentage change in volume of production in project-assisted enterprises” equates to the percentage change in volume of traded pigs. **The baseline-mean value of the volume of traded pigs is 516 pigs per Cambodia MSME pig-trader enterprise.**

Among these enterprises, Table 11 describes the volume of trades by pig type. The large difference between this mean of 516 traded head and the median of 180 traded head per enterprise reflects the presence of both smaller- and larger-scale traders in the sample.

Smaller-scale trader enterprises traded only feeder pigs, in a range of 25-70 head per year. Larger scale trader enterprises, above the feeder pig trade median of 70 head, traded all pig types, including up to 1,000–1,500 piglets and 180–450 feeder pigs per enterprise. With the small sample of traders and this large range of volumes of trade, the mean and median are very limited as measures of central tendency.

TABLE 11: PIG TRADER VOLUME OF TRADES

Item	Sample (n)	% Total	Units per enterprise	
			Mean	Median
Boars	3	43%	4.3	5.0
Sows	3	43%	21	10
Fattening Pigs	7	100%	143	70
Piglets	4	57%	844	1000
Total Sample/ Value	7	100%	516	180

1.2.3 Value of sales of project-assisted enterprises

The Baseline value of the PMEP indicator “Percentage change in value of sales of project-supported SMEs” for pig traders is a **mean value of trades of \$20,598 per Cambodia MSME pig trader enterprise.** This number is the overall mean for smaller- and larger-scale traders in the sample.

The breakdown of the total value of trades per trader enterprise is shown in Table 12. Units traded by pig type are included in the table for reference. Trades of boars and sows occur in low numbers and probably reflect trades of younger pigs to replace breeding stock, and the disposal of older pigs beyond reproductive age. All traders trade fattening pigs, a mean of 143 head for a mean value of \$12,119, at a price of \$85 per head. This mean unit price is lower than the mean pig producer feeder pig sale price of \$133 per head. This may reflect feeder-pig trades to wholesalers by large-scale trader enterprises, and/or the trade of lower live weight feeder pigs for further fattening. Piglet trades are a major source of revenue for larger scale pig traders; a mean of 844 head are traded for a mean value of \$16,999, at a price of \$20 per head.

TABLE 12: PIG TRADER VALUE OF TRADES

Item	Enterprise	% Total	Units		Values (\$)		Unit Value/ Head (\$)	
	Sample (n)		Mean	Median	Mean	Median	Mean	Median
Boars	3	43%	4	5	\$ 404	\$ 180	\$ 93	\$ 36
Sows	3	43%	21	10	\$ 2,382	\$ 311	\$ 113	\$ 31
Fattening Pigs	7	100%	143	70	\$ 12,119	\$ 10,890	\$ 85	\$ 156
Piglets	4	57%	844	1000	\$ 16,999	\$ 16,754	\$ 20	\$ 17
Total Sample/ Value	7	100%	516	180	\$ 20,598	\$ 19,092	\$40	\$106

1.2.4 Cost of business and Income of project-assisted enterprises

This section examines costs of business for pig traders, in order to determine the PMEP Indicator for pig-trader income. Income is defined as the value of annual trades minus the annual cost of business.

Cost of Business

The costs of business for pig traders include costs of bought stock, transport and labor. As mentioned above, the mean and median results are presented for a sample, consisting of both small and large scale traders. **The mean overall cost of business for pig traders is \$17,764 per enterprise.**

The table below shows the baseline cost-of-business results. The major cost of business for traders by far is pig trading stock purchases. All traders, both small- and large-scale, purchase feeder pigs for trade: a mean of 144 head, for a total cost of \$10,523 per enterprise. Larger trader enterprises purchase all types of pigs for trade, including feeder pigs, but mostly purchase piglets – a mean of 844 head at a total mean cost of \$14,656.

In addition, relative small costs are incurred for own transport and hired transport by 29% of traders. Very few trader enterprises incur costs for hired labor.

TABLE 13: PIG TRADER COSTS OF BUSINESS

Item	Sample (n)	% Total	Units		Total Values (\$)	
			Mean	Median	Mean	Median

Item	Sample (n)	% Total	Units		Total Values (\$)	
			Mean	Median	Mean	Median
BOUGHT TRADING STOCK						
Boars	3	43%	4.3	5	\$ 535	\$ 653
Sows	3	43%	21	10	\$ 442	\$ 431
Fattening Pigs	7	100%	144	70	\$ 10,523	\$ 7,539
Piglets	3	43%	844	1000	\$ 14,656	\$ 15,558
GOODS & SERVICES INPUTS						
Hired Labor Part-Time	1	14%	No Unit	No Unit	\$ 191	\$ 191
Hired Labor Full-Time	0	0%	No Unit	No Unit	\$ -	\$ -
Own Transport: Fuel, Oil, Maint.	7	100%	No Unit	No Unit	\$ 265	\$ 151
Hired Transport Costs	2	29%	No Unit	No Unit	\$ 539	\$ 539
Licenses and Fees	4	57%	No Unit	No Unit	\$ 138	\$ 132
Other Major Costs	4	57%	No Unit	No Unit	\$ 28	\$ 30
Total Sample/ Value	7	100%			\$ 17,764	\$ 18,702

Income

Table 14 below shows the baseline income results derived from subtracting cost of business from total value of sales. **The baseline mean value of income is \$2,834 per Cambodia MSME pig trader enterprise.** This mean income is presented for a small sample of traders, including both large- and small-scale enterprises.

TABLE 14: PIG TRADER INCOME

Item	Sample (n)	% Total	Values (USD)	
			Mean	Median
TOTAL VALUE OF SALES	7	100%	\$ 20,598	\$ 19,092
TOTAL COST OF BUSINESS	7	100%	\$ 17,764	\$ 18,702
Total Sample/ Income	7	100%	\$ 2,834	\$ 828*

* Medians as the midpoint sample values for each indicator do not calculate to total here in this small sample n=7

1.2.5 Other productivity indicators for project-assisted enterprises

Traders were also asked to give estimates on feeder-pig trade, and production productivity indicators. Traders' mean live weights of feeder pigs at sale was 75 kg, higher than producer estimates of 66 kilograms, which indicates that traders tend to buy larger feeders intended for sale in the market. The traders' estimate of the mean number of days to raise a feeder pig to 80-90 kg are estimates for pig producers with whom traders do business. They estimate that producers take a mean of 180 days to grow feeder pigs to 80-90 kg live weight, a longer period than the 157 days estimated by producers themselves.

TABLE 15: PIG PRODUCTIVITY INDICATORS: FEEDER PIGS (TRADERS)

Item	Sample (n)	% Total	Units	
			Mean	Median
AVG. FEEDER KG AT SALE	7	71	75	71
AVG. DAYS FEEDER TO 80-90KG	7	155	180	155

Traders were also asked to specify pig mortality rates among pigs bought for trade. Mortality rates were almost zero, as pigs for trade are only kept on hand for a short period for transit to market. The result also seems to indicate that existing pig transportation methods are not a significant cause of pig mortality.

TABLE 16: PIG PRODUCTIVITY INDICATORS: PIG MORTALITY (TRADERS)

MORTALITY RATE: PIG TRADER Item	Sample (n)	% Total	Units	
			Mean	Median
Boars	0	0%	0.00	0.00
Sows	0	0%	0.00	0.00
Fattening Pigs	1	14%	0.01	0.01
Piglets	0	0%	0.00	0.00
Total Sample/ Value	7	100%		

1.2.6 Number of full-time equivalent jobs of project-assisted enterprises

The pig trader labor force mostly includes family-member rather than hired labor, except for the case of one larger-scale trader. The trader labor force is also almost exclusively male in each enterprise. **There are 1.7 full-time equivalent jobs per Cambodia MSME pig trader enterprise.**

TABLE 17: PIG TRADER LABOR

EMPLOYMENT OF PIG TRADER Item	Sample (n)	% Total	Units	
			Mean	Median
FAMILY LABOR				
Male: Full Time	7	100%	1.5	1.0
Female: Full Time	1	14%	1.0	1.0
HIRED LABOR				
Male: Full Time	1	14%	1.5	1.5
Female: Full Time	0	0%	0.0	0.0
Total Sample/ Value	7	100%	1.7	2.0

1.3 PIG INPUT AND SERVICE PROVIDERS, INCLUDING VETERINARIANS

Pig Input and Service providers (ISP) perform an important role in the pig value chain, providing a range of goods and services to support pig production. Veterinarians are a particular type of ISP, although there are overlaps in goods and services provision, particularly in medicinal goods and services, with other input suppliers.

Updated TAMIS client data for all pig input and service providers in July 2009 shows a total of 241 ISP enterprises, including 29% female-owned enterprises. Veterinarians are relatively numerous and perform an important role in the value chain in their own right. Therefore, baseline results for some indicators are provided separately for veterinarians, and other input and service providers.

Demographic profile

A sample of 57 pig input and service providers who joined the Cambodia MSME project within the last six months is included in this pig value chain baseline. This sample includes 33 veterinarian enterprises, 24 input-supplier enterprises, and four enterprises that provide both full veterinarian services and non-veterinarian input supplier services. These sample enterprises are owned by women in 4% of cases and 96% owned by men. Updated TAMIS client data for July 2009, as mentioned above, shows a much larger proportion—29% of these enterprises are owned by women, and that female owned enterprises were under-recorded in the original July 2009 sample frame data (4 total female Vets or VLAs).

The results of these four dual-role enterprises are included in analysis of both veterinarians and input suppliers, where appropriate. Where applicable, this will be reflected in the data tables with total enterprises shown as n=61, veterinarians up to n=37 and input suppliers up to n=28.

These enterprises are predominantly located in rural areas, although 12% are urban based. They are particularly concentrated in the Tonle Sap region, to the north and northeast of the country. Enterprises were sampled in districts in 9 provinces. Most of these enterprises are located in the provinces of Kampong Thom and Pursat, with the remainder in the other seven provinces.

TABLE 18: CAMBODIA MSME SAMPLE PIG INPUT & SERVICE PROVIDER LOCATION PROFILE

	Sample	(Recent	clients	only)	TAMIS	(All	MSME	clients)
Location	(n)	% total	No. F	% F	No.	% total	No. F	% F
Rural/Urban								
% Rural	50	88%	1	50%				
% Urban	7	12%	1	50%				
Region								
Coastal	8	14%						
Plains	15	26%	1	50%				
Tonle Sap	34	60%	1	50%				
Province								
Banteay MC	0	0%	0	0%	7	3%	2	3%
Battambang	6	11%	0	0%	9	4%	2	3%
Kampong Cham	0	0%	0	0%	7	3%	0	0%
Kampong Speu	0	0%	0	0%	15	6%	2	3%
Kampong Thom	16	28%	0	0%	44	18%	19	28%
Kampot	7	12%	0	0%	26	11%	6	9%
Kandal	1	2%	0	0%	1	0%	0	0%
Kratie	0	0%	0	0%	11	5%	1	1%
Phnom Penh	0	0%	0	0%	0	0%	0	0%
Prey Veng	5	9%	1	50%	66	27%	19	28%
Pursat	11	19%	1	50%	23	10%	10	14%
Siem Reap	2	4%	0	0%	14	6%	4	6%
Svay Rieng	4	7%	0	0%	3	1%	0	0%
Takeo	5	9%	0	0%	15	6%	4	6%
Total Sample	57	100%	2	100%	241	100%	69	100%

Pig ISP households are 98% male-headed with 42 as the mean age of household head, and an average household size of 5.2 persons. Almost all of the 30% of female Cambodia MSME ISP clients live in households headed by males. These households have an average of 2.1 adults with at least very basic literacy—they can read a simple message. On average, these households joined the Cambodia MSME project for 3.4 months at the time of the Baseline Survey.

TABLE 19: CAMBODIA MSME SAMPLE PIG INPUT & SERVICE PROVIDER DEMOGRAPHIC PROFILE

Enterprise Household Profile	Sample (n)	Percent of total
Demographics		
Male	56	98%
Female	1	2%
Mean household size (persons)	5.2	
Mean age of household head	42.2	
No pers. >=18 yrs can read simple message	2.1	
Mean months in Cambodia MSME Project	3.4	
Total Sample	7	100%

1.3.1 Value of investments by project-assisted enterprises

Results on investments for ISP enterprises are provided separately for Veterinarian/VLA enterprises and input-supplier enterprises. The baseline mean value of the investments by project-supported pig-veterinarian/VLA SMEs is **\$1,388 per Veterinarian/VLA enterprise. \$10,596 is the baseline mean value of investments by project-supported pig input supplier enterprises.**

Figure 3 lists the investments for pig-veterinarian/VLA enterprises. For over 80% of enterprises, the most common investments include veterinarian equipment, at a mean value of \$93, and motorcycle transport, at a mean value of \$536. Storage and refrigeration equipment is owned by 38% of enterprises. Less than 10% of veterinarian/VLA enterprises have made larger-scale investments, including land and buildings for shop/office or storage facilities.

FIGURE 3: PIG ISP VETERINARIAN/VLA INVESTMENTS

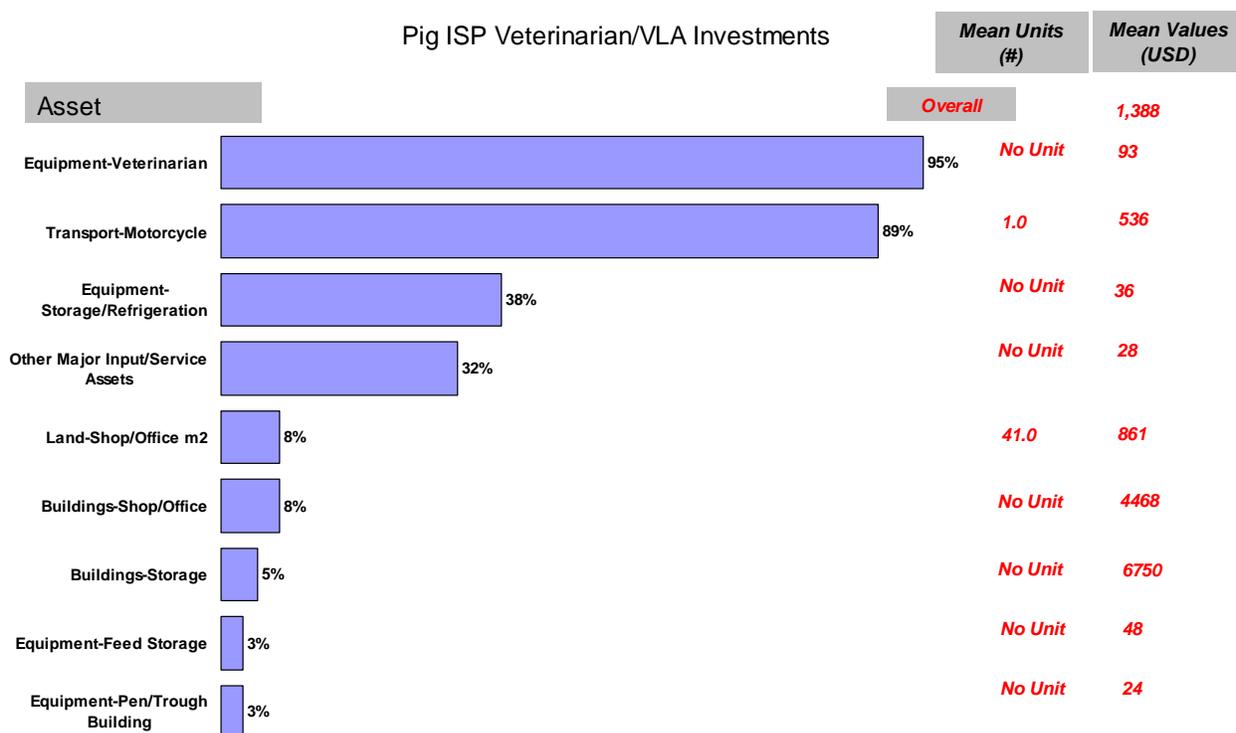
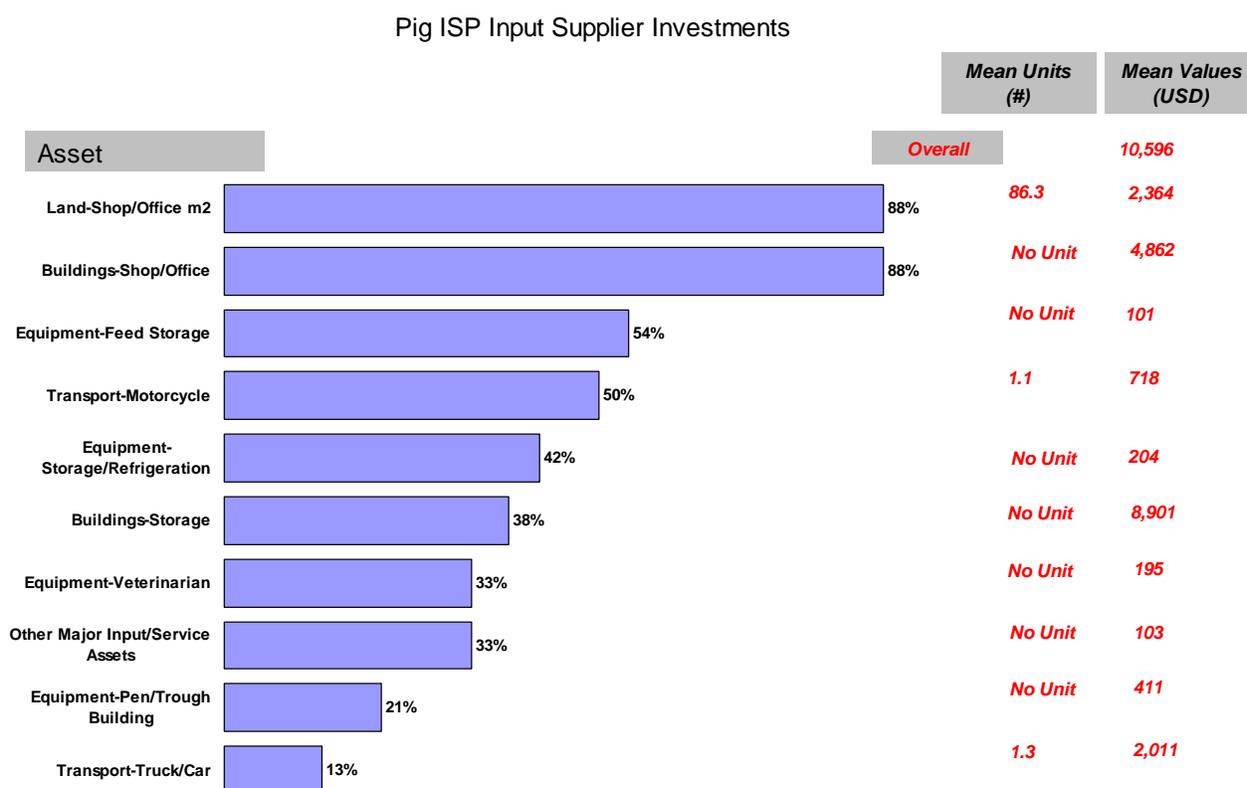


Figure 4 lists the investments for pig input supplier enterprises. These investments are on a much larger scale than among Veterinarian/ VLA enterprises.

FIGURE 4: PIG ISP INPUT SUPPLIER INVESTMENTS



The most common investments, for 88% of enterprises, are land for an office/shop, with a mean of \$2,364. Office/shop buildings are also common, with a mean of \$4,862. Around half of these enterprises have also invested in feed storage equipment, storage or refrigeration equipment, and motorcycles. 38% percent of enterprises have made a large investment in buildings for storage, at a mean of \$8,901 per enterprise. Some businesses have invested in limited amounts of other service equipment, including 33% with veterinary equipment, and 21% with pig-pen or trough-making equipment.

1.3.2 Volume of production of project-assisted enterprises

Pig ISP enterprises provide a range of goods and services, measured in different units, and supplied in different quantities. Therefore, it is not possible to provide a single meaningful PMP indicator of enterprise-level volume of sales that represents ISP enterprises. However, it is important to examine baseline values of volume of sales for goods and services provided by ISP enterprises. Table 20 describes the volume of sales for goods and services among these ISP enterprises. Results for veterinarians and other input suppliers are provided separately.

Veterinarian enterprises' volume of sales typically consists of a combination of service fees (per service) and medicines for vaccination and medical treatment of pigs (per head). In practice, services and medicines can be sold as a package to a customer, so veterinarians were asked to distinguish service fee and medicine components of their sales where possible. The most common and largest sales volumes on average are for vaccines, per head with a mean of 452 per enterprise, and treatment service fees, per service, with a mean of 402 per enterprise. AI services are undertaken by only 8% of veterinarians, and sales of semen account for 5% of these enterprises.

Other ISP enterprises' volume of sales includes manufactured pig feed, with a mean of 19,848 kg sold per enterprise. Over 40% of input suppliers also sell veterinarian supplies, including vaccines and medicines, and other veterinary equipment. These items are often sold to veterinarians and to pig producers directly. Medicines, with a mean volume of 1,756 bottles, are sold more commonly than vaccines, with a mean of 470 bottles per enterprise.

TABLE 20: PIG INPUT & SERVICE PROVIDER VOLUME OF SALES

	Sample (n)	% Total	Units	
			Mean	Median
VETERINARIAN SERVICES				
Vaccination Service Fee (no.)	29	78%	177	36
Vaccines (no. of head)	35	95%	452	160
Treatment Service Fee (no.)	32	86%	402	107
Treatment Medicines (no. head)	31	84%	225	100
A.I Service Fee (no.)	3	8%	3.3	3.0
A.I Semen (no. of head)	2	5%	3.5	3.5
INPUT SUPPLIER SERVICES				
Feed Sales (kg)	24	100%	19848	8000
Vaccination Sales (bottles)	11	46%	470	100
Medicine Sales (bottles)	13	54%	1756	300
Pig Production Equipment Sales	6	25%	No Unit	No Unit
Pig Processing Equipment Sales	0	0%	-	-

	Sample (n)	% Total	Units	
			Mean	Median
Veterinarian Equipment Sales	10	42%	No Unit	No Unit
OTHER SERVICES				
Pig Pen Construction	0	0%	-	-
Pig Trough Construction/Sales	1	4%	1.0	1.0
Pig Transport Services	0	0%	-	-
Other Pig Tech. Advisory Services	0	0%	-	-
Other Major Input/Service Sales	2	8%	No Unit	No Unit
Total Sample/ Value	57	100%		

Of note are the goods and services with low or very low volume of sales to customers: only 25% of enterprises reported selling manufactured pig production equipment to clients, and none sold any pig processing equipment. No enterprises reported sales of pig pen construction equipment, and only one enterprise sold pig troughs. No input suppliers provided any transport or technical advisory services.

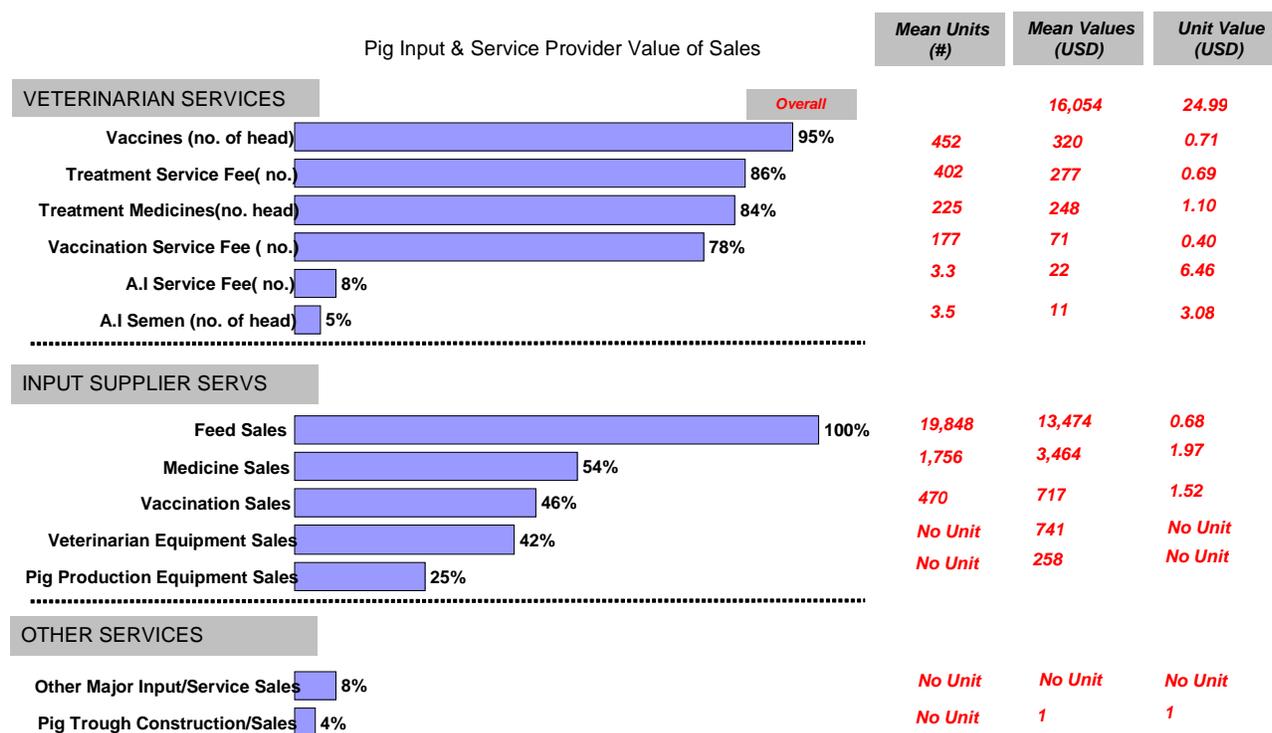
1.3.3 Value of Sales of project-assisted enterprises

For pig ISP enterprises, separate mean values of sales for veterinarians and other input service providers can be calculated. **The baseline mean value of sales is \$808 per Cambodia MSME pig veterinarian enterprise. The baseline mean value of sales is \$16,054 per Cambodia MSME pig ISP enterprises.**

The breakdown of the total value of sales for all pig ISP enterprises is shown in Figure 5. For reference, the volumes of sales, discussed in the previous section, are also included in the figure. For veterinarians, most of the total enterprise sales revenues result from vaccines and medicine, and treatment services. Mean unit values of these medicines and fees are low, mostly less than \$1.00, with a maximum of \$1.10 for treatment medicines.

For all input suppliers, sales revenues are dominated by manufactured pig feed sales, at a mean value of \$13,474 per enterprise. For 54% of input suppliers, medicine sales are also an important source of additional revenue at a mean of \$3,464 among these enterprises. For just over 40% of enterprises, sales of vaccines (\$717) and veterinarian equipment (\$741) are supplementary sources of revenue.

FIGURE 5: PIG INPUT & SERVICE PROVIDER VALUE OF SALES



1.3.4 Income and cost of business of project-assisted enterprises

This section examines costs of business for pig ISPs in order to determine PMEP Indicators of pig ISP income. Income is defined as the value of annual trades minus the annual cost of business. Mean values of cost of business are calculated first, followed by income for veterinarians and other input service providers.

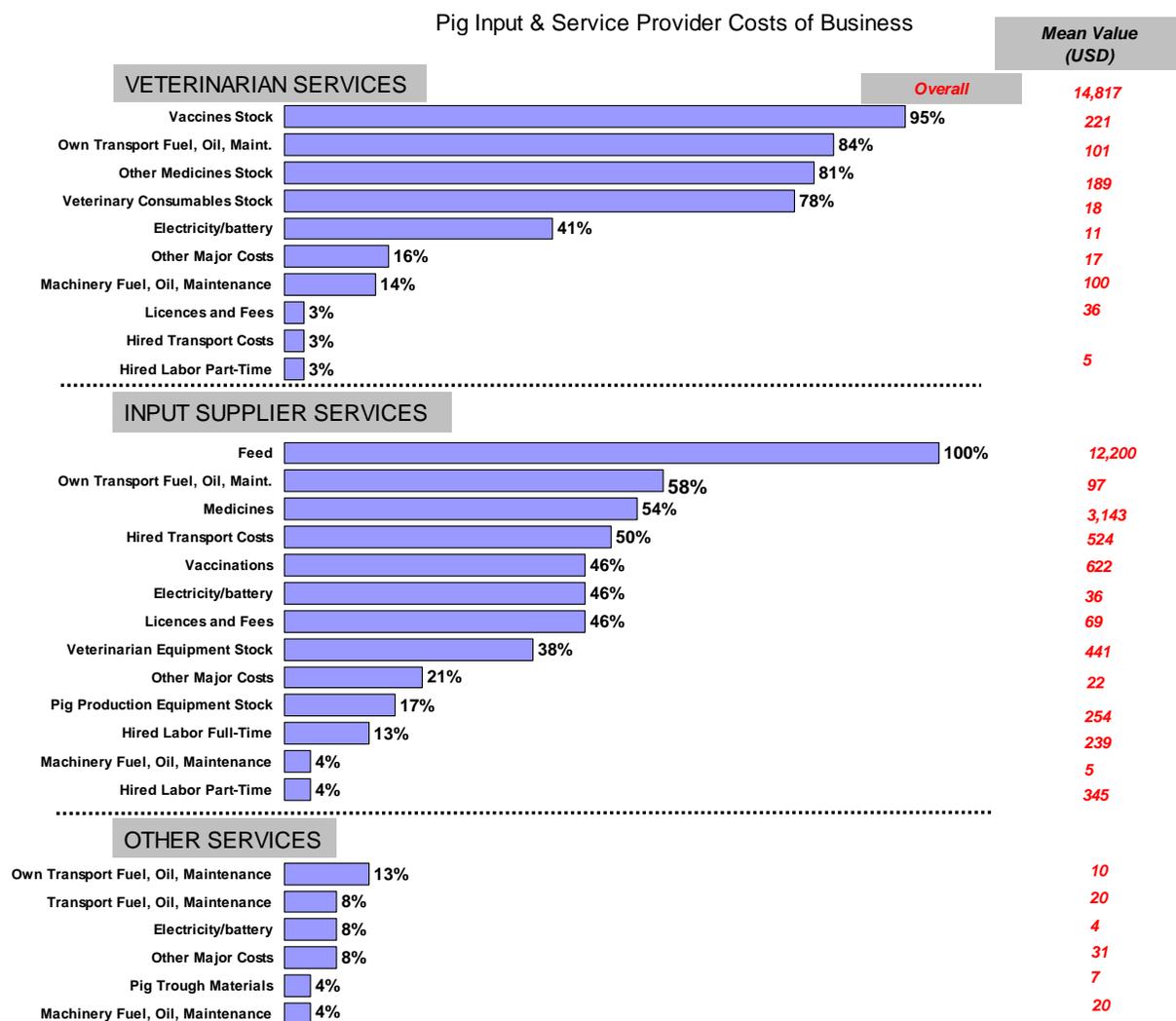
Cost of Business

For pig ISP enterprises, we calculate separate mean values of cost of business for veterinarians and other input service providers. **The mean overall cost of business for veterinarians is \$483 per enterprise. The mean overall cost of business for pig input and service provider enterprises is \$14,817.**

Figure 8 below shows baseline cost of business results. For veterinarians, the most common and largest costs of business are stocks of vaccines and medicines, and own transport costs. Of the total mean enterprise costs of business of \$408, vaccine stocks—95% of enterprises with a mean value of \$221—and medicine stocks—81% of enterprises with a mean value of \$189—typically represent most of this total cost.

For all input suppliers, costs of business are dominated by costs of manufactured pig feed stocks at a mean of \$12,200 per enterprise, of a total mean cost of business of \$14,817. For 54% of input suppliers, medicine stocks are also an important cost, at a mean of \$3,143. For 50% of enterprises, hired transport is another significant cost, at a mean of \$524, as is vaccine stock for 40% of enterprises, at a mean of \$622, and veterinarian equipment stock at a mean of \$441.

FIGURE 6: INPUT & SERVICE PROVIDER COSTS OF BUSINESS



Income

The baseline value for the Component One PMEP indicator “Percentage change in income of project-assisted enterprises” can be determined for pig ISP enterprises and separately for veterinarians and other input and service providers . Income is defined as the value of annual sales minus the annual cost of business.

Table 21: Pig Input & Service Provider Income shows baseline income results derived from subtracting cost of business from total value of sales. **The baseline mean value of income is \$325 per Cambodia MSME veterinarian enterprise, and \$1,236 per Cambodia MSME input supplier enterprise.**

TABLE 21: PIG INPUT & SERVICE PROVIDER INCOME

TOTAL INCOME-PIG INPUT & SERVICE PROVIDER		Sample (n)	% Total	Values (USD)	
Item	Mean			Median	
VETERINARIAN					
TOTAL VALUE OF SALES			\$ 808	\$ 350	
TOTAL COST OF BUSINESS			\$ 483	\$ 238	
TOTAL INCOME	37	100%	\$ 325	\$ 87	
INPUT SUPPLIER					
TOTAL VALUE OF SALES			\$ 16,054	\$ 7,986	
TOTAL COST OF BUSINESS			\$ 14,817	\$ 6,662	
Total Sample/ Income	24	100%	\$ 1,236	\$ 464	

1.3.5 Number of full-time equivalent jobs of project-assisted enterprises

The **baseline number of full-time equivalent jobs is 1.1 jobs per Cambodia MSME veterinarian enterprise**. Family members rather than hired labor primarily represent the veterinarian labor force, which is almost exclusively male.

TABLE 22: PIG VETERINARIAN LABOR

EMPLOYMENT OF Item	Sample (n)	% Total	Units	
			Mean	Median
FAMILY LABOR				
Male Full-Time	37	100%	1.1	1.0
Female Full-Time	1	3%	1.0	1.0
HIRED LABOR				
Male Full-Time	1	3%	0.5	0.5
Female Full-Time	0	0%	0.0	0.0
Total Sample/ Value	37		1.1	1.0

The **baseline number of full-time equivalent jobs is 1.7 jobs per Cambodia MSME input supplier enterprise**. The pig input supplier labor force is most typically family members rather than hired labor, although 21% of enterprises have 1.2 full-time male employees. Family labor typically consists of one male and one female per enterprise, working full-time.

TABLE 23: PIG INPUT/SERVICE PROVIDER LABOR

EMPLOYMENT OF INPUT SUPPLY & OTHER SERVICE Item	Sample (n)	% Total	Units	
			Mean	Median
FAMILY LABOR				
Male Full-Time	22	92%	1.1	1.0
Female Full-Time	21	88%	1.2	1.0
HIRED LABOR				

EMPLOYMENT OF INPUT SUPPLY & OTHER SERVICE Item	Sample (n)	% Total	Units	
			Mean	Median
Male Full-Time	5	21%	1.2	1.0
Female Full-Time	1	4%	1.0	1.0
Total Sample/ Value	24	100%		

1.4 OVERALL PIG VALUE CHAIN PMEP INDICATOR RESULTS

The tables below summarize baseline study results for pig value chain enterprise-level performance indicators outlined in the Cambodia MSME PMEP. The first table presents overview results for the pig value chain in total and simple mean values when this total is divided by the total number of pig value chain enterprises for all value chain actor types.

TABLE 24: BASELINE STUDY RESULTS FOR THE PIG VALUE CHAIN: ALL ACTORS

Indicator	Baseline Values		
	TOTAL VALUE	SAMPLE (n)	MEAN VALUE
1 Percentage change in value of sales of project-assisted enterprise (\$/%)	\$1,977,286	623	\$3,174
2 Cost of business (\$/%)	\$1,482,955	623	\$2,380
3 Percentage change in income (gross profit = value of sales – cost of business \$/%)	\$494,307	623	\$793
4 Percentage change in volume of production in project-assisted enterprise (units/%)	Multiple products	623	
5 Number of full-time equivalent jobs created: (FT Job Equiv.= FT jobs*100%+PT jobs*50%)	1494	623	2.4
6 Percentage change in investments(\$/%)	\$2,925,029	623	\$4,695

The following table presents PMEP results for the pig value chain disaggregated by types of pig value chain actors.

TABLE 25: BASELINE STUDY RESULTS FOR THE PIG VALUE CHAIN BY ACTOR

Indicator		Value Chain Actor	Baseline Values			
			TOTAL VALUE	MEAN VALUE	MEDIAN VALUE	SAMPLE (n)
1	Percentage change in value of sales of project-assisted enterprise (\$/%)	Pig Producer	\$1,417,908	\$2,555	\$1,382	555
		Pig Trader	\$144,186	\$20,598	\$19,092	7
		Pig ISP-Vet./LVA	\$29,896	\$808	\$350	37
		Pig ISP- Input Supplier	\$385,296	\$16,054	\$ 7,986	24
	Cost of business (\$/%)	Pig producer	\$985,126	\$1,775	\$1,020	555
		Pig Trader	\$124,350	\$17,764	\$18,702	7
		Pig ISP-Vet./LVA	\$17,871	\$483	\$238	37
		Pig ISP- Input Supplier	\$355,608	\$14,817	\$6,662	24
2	Percentage change in income (gross profit= value of sales-cost of business\$/%)	Pig producer	\$432,782	\$780	\$311	555
		Pig Trader	\$19,836	\$2,834	\$828	7
		Pig ISP-Vet./LVA	\$12,025	\$325	\$87	37
		Pig ISP- Input Supplier	\$29,664	\$1,236	\$464	24
3	Percentage change in volume of production in project-assisted enterprise (units/%)	Pig producer	13,850	25	15	555
		Pig Trader	3,610	516	180	7
		Pig ISP-Vet./LVA	Multiple products	-	-	37
		Pig ISP- Input Supplier	Multiple products	-	-	24
4	Number of full-time equivalent jobs created: (full-time job equiv.= FT jobs*100%+PT jobs*50%)	Pig producer	1,382	2.5	2.0	555
		Pig Trader	13	1.9	1.0	7
		Pig ISP-Vet./LVA	42	1.1	1.0	37
		Pig ISP- Input Supplier	57	2.4	2.0	24
5	Percentage change in investments(\$/%)	Pig producer	\$2,615,312	\$4,712	\$1,515	555
		Pig Trader	\$4,057	\$580	\$503	7
		Pig ISP-Vet./LVA	\$51,356	\$1,388	\$618	37
		Pig ISP- Input Supplier	\$254,304	\$10,596	\$4,073	24

2. FISH VALUE CHAIN

METHODOLOGY

The Fish Value Chain has been selected as an important target for Cambodia MSME project support, with 407 Fish enterprises representing 17% of enterprise clients in Component One supported value chains in July 2009. By October, that number grew to 464. Updated TAMIS client data for July 2009 shows that 24% of enterprises are female-owned, and 76% are male-owned. This client base reflects the increasing prevalence of Cambodian rural households engaged in fish production, and its potential to increase rural incomes across the country.

Fish enterprises in seven provinces were randomly selected for this survey, with a geographic distribution similar to that of all Cambodia MSME fish value chain clients. These enterprises joined Cambodia MSME within the preceding six months, and sample districts contained 88% of recent Cambodia MSME fish producer clients. Proportional quotas set for district and fish producer enterprises were randomly sampled. A sample of four fish traders that joined the project within the last six months was also included. This sample yielded results for 146 fish producer enterprises, and four fish traders. Information on fish value chain actors, including fingerling suppliers, processors, wholesalers, and retailers was beyond the scope of the study, as no enterprises met survey criteria in July 2009—listed in TAMIS as active, located within the 40 sample districts, and joined the project within the previous six months.

2.1 FISH PRODUCERS

Demographic profile

The 146 Cambodia MSME sample fish-producer enterprises are located mainly in rural areas (86%). They are spread across multi-province regions of the country but are most commonly found within the Plateau/Mountain and Plains regions. Fish producers were sampled in districts in seven provinces, with most in Kampong Speu, Kampot, and Prey Veng.

15% of these sample enterprises are female-owned, and 85% male-owned. Updated TAMIS client data for July 2009 shows an increase to 24% of women-owned enterprises, and that these enterprises were under-recorded in the original July 2009 sample frame data, which reported female fish producers at 13%.

TABLE 26: FISH PRODUCER LOCATION PROFILE

Location	Sample	(Recent clients only)			TAMIS	(All	MSME	clients)
	(n)	% total	No. F	% F	No.	% total	No. F	% F
Rural/Urban								
% Rural	126	86%	2	9%				
% Urban	20	14%	20	91%				
Region								
Coastal	27	18%	10	45%				
Plateau/mountain	48	33%	3	14%				
Plains	55	38%	8	36%				
Tonle Sap	16	11%	1	5%				

Location	Sample	(Recent clients only)			TAMIS	(All	MSME	clients)
	(n)	% total	No. F	% F	No.	% total	No. F	% F
Provinces								
Battambang	10	7%	0	0%	48	12%	8	9%
Kampong Cham	16	11%	0	0%	116	30%	31	34%
Kampong Speu	39	27%	3	14%	6	2%	1	1%
Kampong Thom	0	0%	0	0%	25	6%	3	3%
Kampot	26	18%	10	45%	71	18%	29	32%
Kandal	0	0%	0	0%	58	15%	6	7%
Kratie	0	0%	0	0%	2	1%	1	1%
Phnom Penh	0	0%	0	0%	2	1%	1	1%
Prey Veng	29	20%	6	27%	43	11%	9	10%
Pursat	7	5%	1	5%	0	0%	0	0%
Takeo	19	13%	2	9%	19	5%	3	3%
Total Sample	146	100%	22	100%	390	100%	92	100%

As with pig value chain enterprises, demographic data on Cambodia MSME fish producer households was collected using a standard USAID Poverty Assessment Tool. Among fish producers, 91% of household heads are male, with a mean age of 47 years, and an average household size of 5.6 persons. Among pig producers, some female Cambodia MSME clients live in households headed by men. These households have an average of 2.3 adults with at least very basic literacy. Generally these households were Cambodia MSME project clients for 3.7 months at the time of this survey.

TABLE 27: FISH PRODUCER HOUSEHOLD DEMOGRAPHIC PROFILE

Enterprise Profile	Sample (n)	Percent of the total
Demographic		
Male	133	91%
Female	13	9%
Mean household size (persons)	5.6	
Mean age of household head	47.4	
No pers. >=18 yrs can read simple message	2.3	
Mean months in MSME project	4.9	
Total Sample	146	100%

1.4.1 Value of investments by project-assisted enterprises

Fish enterprises require substantial investments in land, fish ponds, and equipment for production, as listed in Figure 6. **The baseline mean value of the PMEP indicator for total investments is \$12,028 per fish producer enterprise.** Fish enterprises require substantial investments in land, fish ponds and equipment for production as listed in Figure 7. The first two columns show the frequency of ownership of each type of investment among all enterprises. The next columns show the mean value and mean number of units owned by type, among enterprises that do own that type investment.

All enterprises have invested in land for fish production with a mean area of 1,530 m² valued at \$8,763, including larger enterprises, and more typically, a median of 800m² valued at \$1,976. Further, all fish

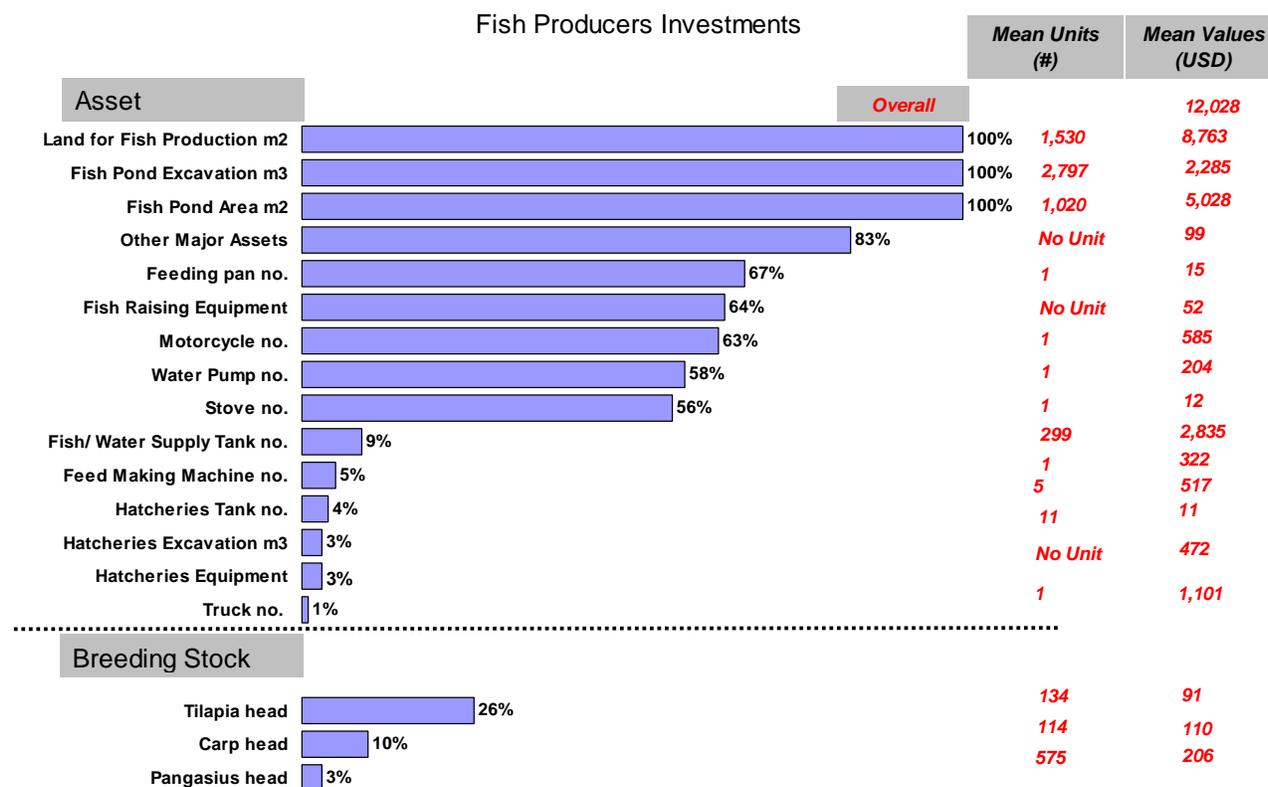
enterprises have invested in a mean 2,797 m3 of fish pond excavation at a mean value of \$2,285, and other pond establishment costs for a mean area of 1,020 m2, at a mean investment of \$5,028 per enterprise.

In addition to basic investments in land and ponds, one-half to two-thirds of fish producers also invested in production equipment, including feeding pans, stoves, water pumps, small-item fish raising equipment, and motorcycles. Water pumps at a mean value of \$204, and motorcycles at a mean value of \$585, are the most expensive of these types of investments.

Notably uncommon investments among enterprises include hatcheries, hatchery tanks and equipment, water supply tanks, and feed-making machines.

Investments in fish brood stock are low-cost, but not common among enterprises. The most common investment in brood stock was tilapia fish, purchased by 26% of enterprises, with a mean of 134 head at \$91 per enterprise. Only 10% of producers invested in carp brood stock, and only 3% in pangasius brood stock.

FIGURE 7: FISH PRODUCER INVESTMENTS



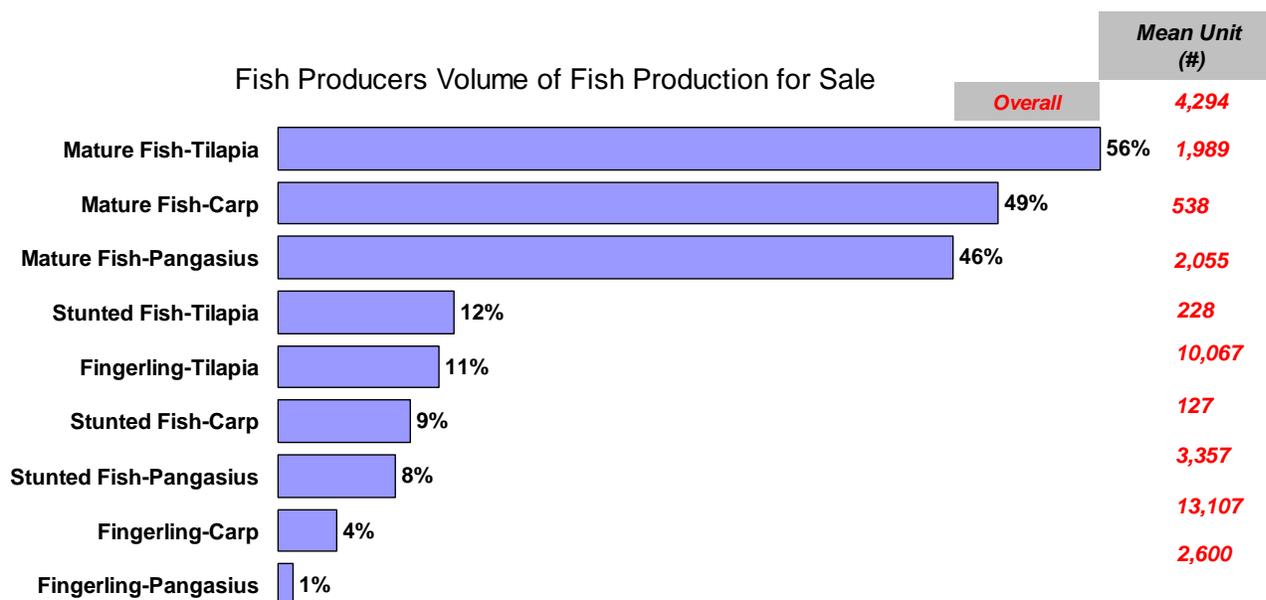
2.1.1 Volume of production of project-assisted enterprises

Fish producers raise one or more of three species of fish: Tilapia, Carp or Pangasius. Fish have three general growth stages: fingerling, stunt fish and mature fish. Fish production most commonly involves raising bred or bought fingerlings to mature fish for sale. The PMEP indicator for fish volume of production is measured as the total number of fish of all species and growth stages produced for sale per

enterprise. This definition links directly to the companion PMEP indicator “value of sales” reported in the next section. **The baseline mean volume of production of fish for sale is 4,296 head of fish per fish producer enterprise.**

The breakdown of the total volume of production of fish for sale by type is shown in Figure 8. Mature fish of the three species are most commonly produced for sale, with 56% of enterprises producing a mean of 1,989 mature tilapia, 49% producing a mean 538 mature carp, and 46% producing a mean 2,055 mature pangasius. Only 8-12% of enterprises produce stunt fish of any species for sale and only 1-11% of enterprises produce fingerlings for sale.

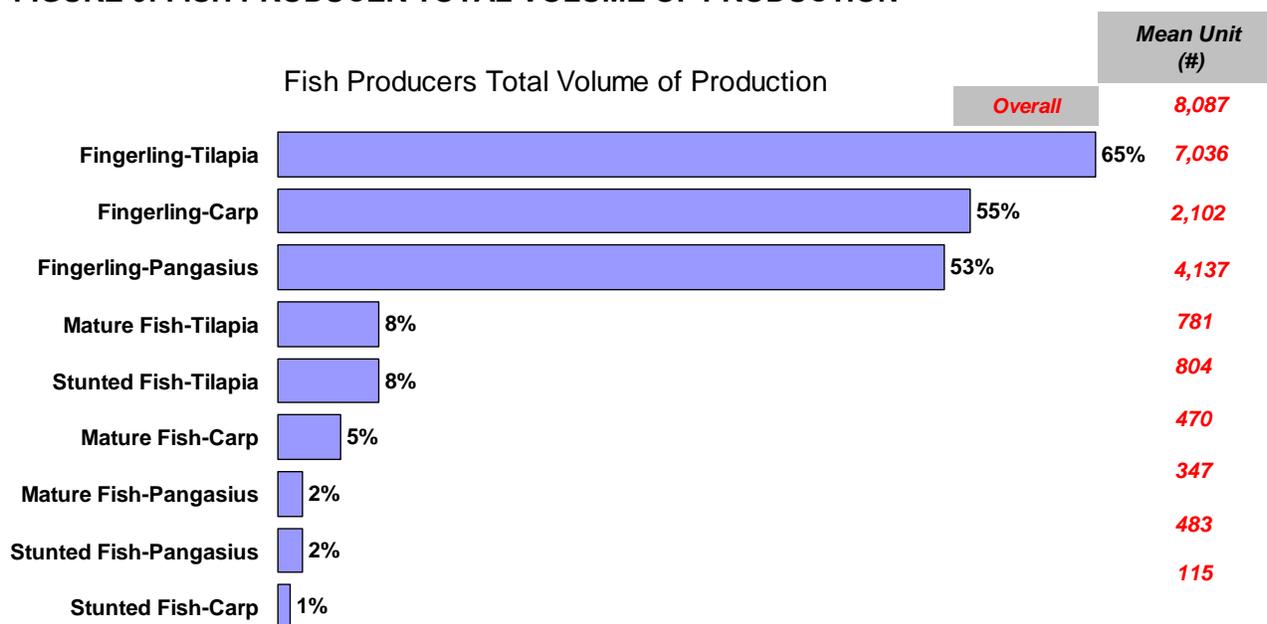
FIGURE 8: FISH PRODUCER VOLUME OF FISH PRODUCTION FOR SALE



The baseline survey additionally asked about total fish production in respondents’ enterprises, including fish bred and bought rather than only sold. With fish production underway at the time of the baseline, a majority of fish producers had sizeable fish stocks on hand, mostly consisting of fingerlings, and in fewer cases of stunt fish and mature fish in final growth stages. The mean total volume of production of fish is 8,087 head per fish producer enterprise.

Figure 11 shows these results. Fingerlings were most common, with 65% of enterprises raising a mean of 7,036 tilapia fingerlings, 55% raising a mean of 2,102 carp fingerlings, and 53% raising a mean of 4,137 pangasius fingerlings. Only 1-8% of enterprises had stunt fish of any species in production, and only 2-8% mature fish of any species in production.

FIGURE 9: FISH PRODUCER TOTAL VOLUME OF PRODUCTION

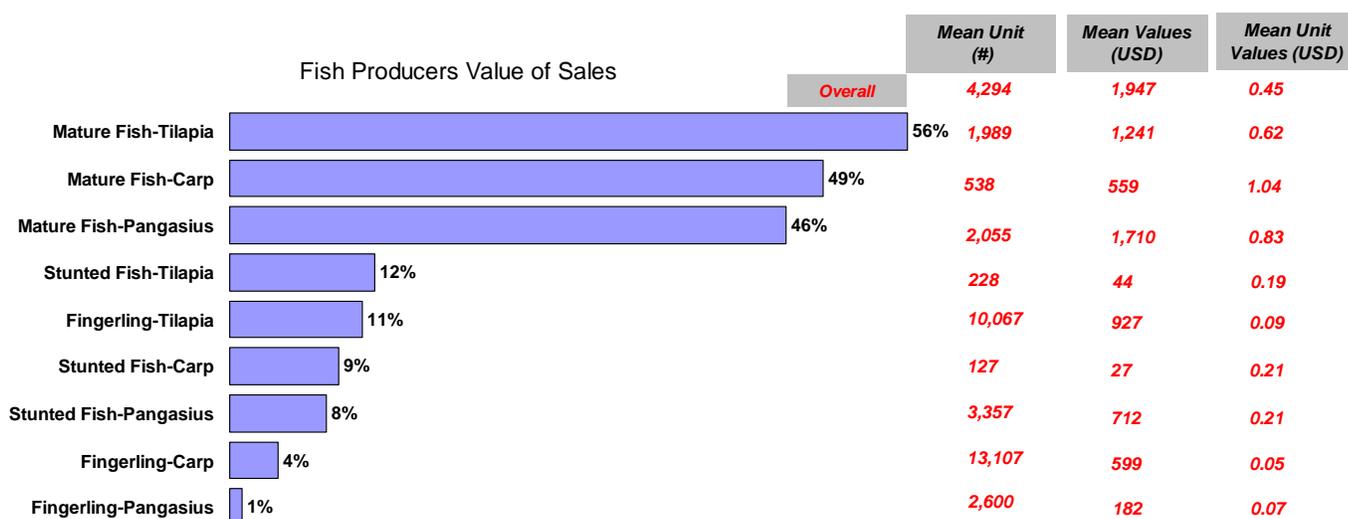


2.1.2 Value of sales of project-assisted enterprises

The baseline mean value of sales is \$1,947 per Cambodia MSME fish producer enterprise. The breakdown of the total value of sales per fish enterprise is shown in Figure 10. For reference, the volumes of sales, discussed in the previous section, are also included in the figure. The mean total enterprise value of sales is derived from the mix of species and growth stages of fish at sale. Most of this total value of sales is derived from sales of mature fish: for 56% of enterprises, mature tilapia sales, with a mean value of \$1,241; for 49% of enterprises, mature carp sales, at a mean value of \$559; and for 46% of enterprises, mature pangasius sales, at a mean value of \$1,710.

Only 8-12% of enterprises sell stunt fish of any species at \$0.19 to \$0.21 per head. For 8% of producers, pangasius stunt fish sales generate significant revenues—\$71—due to high volumes of sale. Only 1-11% of enterprises sell fingerlings for sale. Among these enterprises, revenue from fingerling sales become significant where sales volumes reach 10,000 head or more.

FIGURE 10: FISH PRODUCER VALUE OF SALES



2.1.1 Cost of business and income of project-assisted enterprises

This section examines cost of business for fish production to determine the PMEP fish enterprise income indicator. Income is defined as the value of annual sales, minus the annual cost of business.

Cost of Business

The cost of business for fish production include cost of bought stock, and goods and services used during fish production cycles. **The mean cost of business for fish enterprises is \$608 per enterprise.**

Figure 11 shows the cost of business baseline results. Roughly half of all fish producers bought fish stock to supplement breeding—mostly for fingerlings, variously including means of 1,480 tilapia fingerlings for \$40; 1,991 carp fingerlings for \$35; and 1,500 pangasius fingerlings for \$169. The most common costs of business in goods and services include fish feed: manufactured feed at 54% of enterprises’ mean cost, for \$242; rice bran at 54% of enterprises’ mean cost, for \$152; and broken rice at 65% of enterprises’ mean cost, for \$65. Only 10-12% of enterprises bought medicines and only 1-2% bought hormones. Energy costs were common, including own transport fuel oil and maintenance at 70% of enterprises’ mean cost, for \$45; machinery fuel oil and maintenance at 60% of enterprises’ mean cost, for \$43, and electricity at 52% of enterprises’ mean cost, for \$20. Only 3% of enterprises had costs for hired labor.

FIGURE 11: FISH PRODUCER COST OF BUSINESS

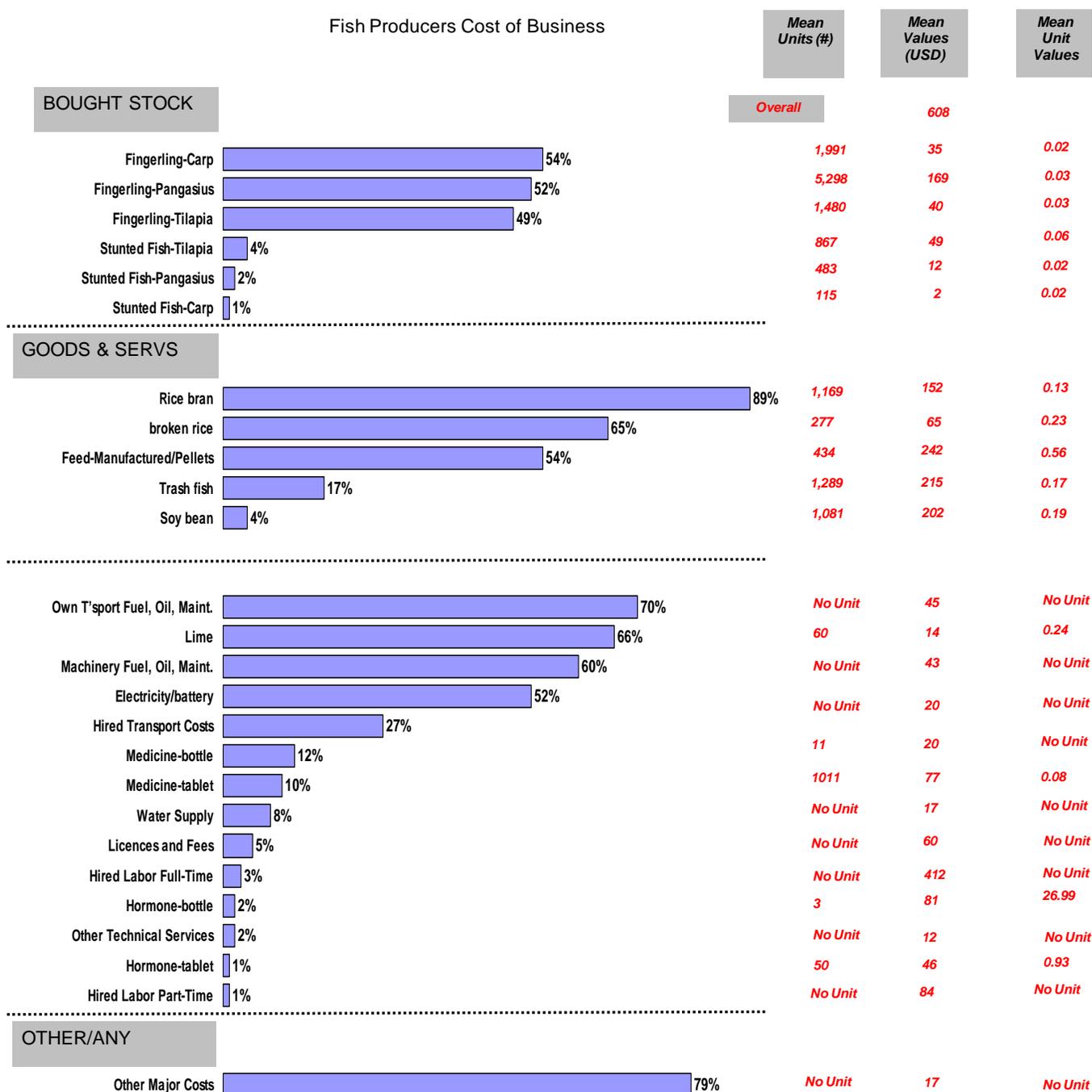


Table 28 below shows baseline income results derived by subtracting cost of business from total value of sales. **The baseline PMEP mean value of income is \$1,339 per Cambodia MSME fish producer enterprise.**

TABLE 28: FISH PRODUCER INCOME

TOTAL INCOME-FISH PRODUCTION		Sample (n)	% Total	Values (USD)	
Item	Mean			Median	
TOTAL VALUE OF SALES				\$ 1,947	\$ 657
TOTAL COST OF BUSINESS				\$ 608	\$ 266
Total Sample/ Income	146	100%		\$ 1,339	\$ 221

2.1.3 Other productivity indicators for project-assisted enterprises

The baseline survey included two indicators, fish productivity and fish mortality by species, considered important but not included in the PMEP indicator matrix.

Table 29 includes two indicators of productivity related to mature fish production. Estimated average kilogram weight of mature fish at sale was 0.9 to 1 kilogram per head for all species. The estimated average number of months required to grow fish to mature sale weight was 7.7 months for tilapia and carp and 9 months for pangasius.

TABLE 29: FISH PRODUCER PRODUCTIVITY INDICATORS

PRODUCTIVITY INDICATOR -FISH PRODUCTION		Sample (n)	% Total	Units	
Item	Mean			Median	
AVG. FEEDER KG AT SALE					
Avg. Mature Carp kg at sale	94	64%	1.0	0.8	
Avg. Mature Tilapia kg at sale	94	64%	0.9	0.6	
Avg Mature Pangasius kg at sale	74	51%	0.9	0.7	
AVG MONTHS FISH GROWTH TO MATURE SOLD KG					
AVG months fish grow to mature sold kg-Carp	94	64%	7.7	7.0	
AVG months fish to grow to mature sold kg-Tilapia	94	64%	7.7	7.0	
AVG mths fish to grow to mature sold kg-Pangasius	74	51%	9.0	9.0	
Total Sample/ Value	146	100%			

Table 30 shows productivity indicators in terms of mature fish mortality by species. The first column shows the number of such enterprises reporting that one or more head died, by type. The reported mortality rates are at the enterprise level, as the percentage of each fish type reported dead as a proportion of all mature fish of that type produced by the enterprise.

A higher proportion of 34% of enterprises reported mature tilapia mortality as compared to carp and pangasius. The mortality rates by species among enterprises were similar, in the range of 7-9% of mature fish produced. These mortality rates represent a significant loss to production and sales.

TABLE 30: FISH PRODUCER MORTALITY INDICATORS

Item	Sample (n)	% Total	Units	
			Mean	Median
MATURE TILAPIA MORTALITY RATE	49	34%	8.8%	4.8%
MATURE CARP MORTALITY RATE	31	21%	7.4%	6.5%

Item	Sample (n)	% Total	Units	
			Mean	Median
MATURE PANGASius MORTALITY RATE	36	25%	7.4%	4.0%
Total Sample/ Value	146	100%		

2.1.4 Number of full-time equivalent jobs of project-assisted enterprises

The baseline number of full-time equivalent jobs is 2.7 per Cambodia MSME fish producer enterprise. The fish enterprise labor force is overwhelmingly family, rather than hired, labor. On average, 1.5 men and 1.2 women are engaged full-time in fish production in each enterprise.

TABLE 31: FISH PRODUCER EMPLOYMENT

EMPLOYMENT			Units	
Item	Sample (n)	% Total	Mean	Median
FAMILY LABOR				
Male Full-Time	141	97%	1.5	1.5
Female Full-Time	121	83%	1.2	1.0
HIRED LABOR				
Male Full-Time	6	4%	1.3	1.0
Female Full-Time	2	1%	1.3	1.3
Total Sample/ Value	146	100%	2.7	2.5

2.2 FISH TRADERS

Fish trader enterprises trade fish for profit. Fish are purchased from producers, and transported and sold to other fish producers, processors, wholesalers, or retailers. Updated TAMIS client data for all traders in July 2009 shows six total fish traders, including three female owned enterprises.

Demographic profile

A limited sample of four fish traders who joined Cambodia MSME within the last six months is included in this value chain baseline. Half of these enterprises are women-owned. All traders are located in rural areas, mostly within the Tonle Sap region. The traders are located in the provinces of Prey Veng and Pursat.

TABLE 32: CAMBODIA MSME SAMPLE FISH TRADER LOCATION PROFILE

	Sample	(Recent	clients	only)	TAMIS	(All	MSME	clients)
Location	(n)	% total	No. F	% F	No.	% total	No. F	% F
Rural/Urban								
% Rural	4	100%	2	100%				
Region								
Coastal	1	25%						
Plains	1	25%	1	50%				
Tonle Sap	2	50%	1	50%				
Provinces								
Kampong Cham	0	0%	0	0%	2	33%	1	33%
Kampot	0	0%	0	0%	1	17%	1	33%
Kandal	0	0%	0	0%	1	17%	0	0%
Kratie	0	0%	0	0%	1	17%	1	33%
Prey Veng	1	25%	1	50%	1	17%	0	0%
Pursat	3	75%	1	50%	0	0%	0	0%
Total Sample	4	100%	2	100%	6	100%	3	100%

Fish-trader households are all male-headed, with a mean age of 43 years, and an average household size of 4.0 persons. Those figures include households of the 50% sampled female Cambodia MSME fish-trader clients. Sampled households have an average of 1.8 adults with at least very basic literacy—they can read a simple message. Compared to fish-producer households, heads and families are younger. On average these households were associated with the Cambodia MSME project for five months at the time of the Baseline Survey.

TABLE 33: FISH TRADER DEMOGRAPHIC PROFILE

Enterprise Household Profile	Sample (n)	% Total
Demographic		
Male	4	100%
Mean household size (persons)	4.0	
Mean age of household head	42.8	
No pers. >=18 yrs can read simple message	1.8	
Mean months in Cambodia MSME project	5.0	
Total Sample	4	100%

2.2.1 Value of investments by project-assisted enterprises

The baseline mean value of investments by project-supported fish traders is \$902 per enterprise. As illustrated in Table 34, transport is the main investment. All traders owned motorcycles, and half the enterprises also owned trucks for transport. Unit values for trucks and motorcycles are low, so most transport seems to consist of older vehicles, likely without any modification for fish transport. These enterprises invested little in other assets.

TABLE 34: FISH TRADER INVESTMENTS

INVESTMENTS-FISH TRADER Item	Number	% Total	Units		Values (USD)	
			Mean	Median	Mean	Median
ASSETS						
Fish transport: motorcycle	4	100%	1.3	1.0	\$ 273	\$ 225
Fish transport: truck	2	50%	1.0	1.0	\$ 1,101	\$ 1,101
Other major trading assets	4	100%	No Unit	No Unit	\$ 79	\$ 45
Total Sample/ Value	4	100%			\$ 902	\$ 844

2.2.2 Volume of production of project-assisted enterprises

Fish trader enterprises do not themselves produce fish for sale but instead trade fish. For fish traders, the PMEP indicator “Percentage change in volume of production in project-assisted enterprises” refers to the volume of traded fish. **The baseline mean volume of traded fish is 35,910 head of fish of all types—all species and growth stages—per Cambodia MSME enterprise.**

Table 35 describes the volume of trades by fish species and growth stage. Most commonly, mature fish of all three species are traded. The Pangasius species has largest sales volume; one enterprise sold a very large volume of 62,200 Pangasius fingerlings. These high volume fingerling sales increase the mean number of head sold by all four sampled enterprises. No traders reported selling fish in the stunt fish growth stage.

TABLE 35: FISH TRADER VOLUME OF TRADES

Item	Sample (n)	% Total	Units	
			Mean	Median
Mature fish - Tilapia	2	50%	5,100	5,100
Mature fish - Carp	2	50%	9,300	9,300
Mature fish - Pangasius	3	75%	17,833	9,000
Stunted fish -Tilapia	0	0%	0	0
Stunted fish - Carp	0	0%	0	0
Stunted fish - Pangasius	0	0%	0	0
Fingerling - Tilapia	0	0%	0	0
Fingerling - Carp	0	0%	0	0
Fingerling - Pangasius	1	25%	62,200	62,200
Total Sample/ Value	4	100%	35,910	31,475

2.2.3 Value of sales of project-assisted enterprises

The baseline for the PMEP indicator “Percentage change in value of sales of project-supported SMEs” for fish traders is a **mean value of trades of \$22,024 per Cambodia MSME fish trader enterprise.** The breakdown of the value of trades per enterprise is shown in Table 36. Unit volumes traded by type are included in the table for reference. The most common and largest contribution to total value of sales is mature fish, mainly Pangasius at a mean of \$17,820, followed by Carp and Tilapia species.

TABLE 36: FISH TRADER VALUE OF SALES

Item	Sample (n)	% Total	Units		Values (USD)		Unit Value (USD)	
			Mean	Median	Mean	Median	Mean	Median
Mature fish - Tilapia	2	50%	5,100	5,100	\$ 5,070	\$ 5,070	\$ 0.99	\$ 0.99
Mature fish - Carp	2	50%	9,300	9,300	\$ 9,270	\$ 9,270	\$ 1.00	\$ 1.00
Mature fish - Pangasius	3	75%	17,833	9,000	\$ 17,820	\$ 9,000	\$ 1.00	\$ 1.00
Stunted fish -Tilapia	0	0%	0	0	\$ -	\$ -	\$ -	\$ -
Stunted fish - Carp	0	0%	0	0	\$ -	\$ -	\$ -	\$ -
Stunted fish - Pangasius	0	0%	0	0	\$ -	\$ -	\$ -	\$ -
Fingerling - Tilapia	0	0%	0	0	\$ -	\$ -	\$ -	\$ -
Fingerling - Carp	0	0%	0	0	\$ -	\$ -	\$ -	\$ -
Fingerling - Pangasius	1	25%	15,375	15,375	\$ 552	\$ 552	\$ 0.036	\$ 0.036
Total Sample/ Value	4	100%			\$ 22,024	\$ 21,837		

2.2.4 Cost of business and Income of project-assisted enterprises

Cost of Business

The costs of business for fish traders mainly include costs of bought fish stock, and transport. **The mean overall cost of business for fish traders is \$19,621 per enterprise.**

Table 37 below shows the baseline cost of business. The major cost of business for traders is fish trading stock purchases, which account for 90% of total business costs on average. Corresponding to trader sales data, these costs are mainly for mature fish, largely Pangasius. Other limited types of business costs include own transport costs, fees and other costs. No trader enterprises incurred costs for hired labor.

TABLE 37: FISH TRADERS COST OF BUSINESS

Item	Sample (n)	% Total	Units		Values (USD)		Unit Value (USD)	
			Mean	Median	Mean	Median	Mean	Median
BOUGHT FISH								
Mature fish - Tilapia	2	50%	5,100	5,100	\$ 3,684	\$ 3,684	\$ 0.63	\$ 0.63
Mature fish - Carp	2	50%	9,300	9,300	\$ 7,360	\$ 7,360	\$ 0.79	\$ 0.79
Mature fish - Pangasius	3	75%	17,833	9,000	\$ 16,941	\$ 8,640	\$ 0.95	\$ 0.96
Stunted fish -Tilapia	4	0%	0	0	\$ -	\$ -	\$ -	\$ -
Stunted fish - Carp	0	0%	0	0	\$ -	\$ -	\$ -	\$ -
Stunted fish - Pangasius	0	0%	0	0	\$ -	\$ -	\$ -	\$ -
Fingerling - Tilapia	0	0%	0	0	\$ -	\$ -	\$ -	\$ -
Fingerling - Carp	0	0%	0	0	\$ -	\$ -	\$ -	\$ -
Fingerling - Pangasius	1	25%	62,200	62,200	\$ 1,045	\$ 1,045	\$ 0.017	\$ 0.017
OTHER INPUTS								
Hired labor: part-time	0	0%	No Unit	No Unit	\$ -	\$ -	No Unit	No Unit
Hired labor: full-time	0	0%	No Unit	No Unit	\$ -	\$ -	No Unit	No Unit

Item	Sample (n)	% Total	Units		Values (USD)		Unit Value (USD)	
			Mean	Median	Mean	Median	Mean	Median
Transport fuel, oil, Maintenance	4	100%	No Unit	No Unit	\$ 242	\$ 214	No Unit	No Unit
Transport rental costs	1	25%	No Unit	No Unit	\$ 96	\$ 96	No Unit	No Unit
Licences and fees	3	75%	No Unit	No Unit	\$ 72	\$ 72	No Unit	No Unit
Other major costs	4	100%	No Unit	No Unit	\$ 107	\$ 72	No Unit	No Unit
Total Sample/ Value	4	100%			\$ 19,621	\$ 19,193		

Income

Income is defined as the value of annual trades minus the annual cost of business. **The baseline mean income is \$2,403 per Cambodia MSME fish trader enterprise.** Table 38 below shows the baseline income results derived by subtracting cost of business, from total value of trades.

TABLE 38: FISH TRADER INCOME

Item	Sample (n)	% Total	Values (USD)	
			Mean	Median
TOTAL VALUE OF SALES	4	100%	\$ 22,024	\$ 21,837
TOTAL COST OF BUSINESS	4	100%	\$ 19,621	\$ 19,193
Total Sample/ Income	4	100%	\$ 2,403	\$ 2,643

2.2.5 Other productivity indicators for project-assisted enterprises

Traders were also asked to give estimates of the average weight of mature fish of various species at sale. Traders mean live weights of mature fish at sale varied by species, from a high for Pangasius at a mean of 1.3 kg per head, to a low of Tilapia, sold at a mean of 0.7 kg per head.

TABLE 39: FISH TRADER PRODUCTIVITY INDICATORS

Item	Sample (n)	% Total	Units	
			Mean	Median
AVG. MATURE FISH KG AT SALE				
Avg. mature Carp kg at sale	2	50%	0.9	0.9
Avg. mature Tilapia kg at sale	2	50%	0.7	0.7
Avg mature Pangasius kg at sale	3	75%	1.3	1.2
Total Sample/ Value	4	100%		

2.2.6 Number of full-time equivalent jobs of project-assisted enterprises

The PMEP **baseline number of full-time equivalent jobs is 2.7 per Cambodia MSME fish trader enterprise.** The labor force is exclusively family members rather than hired labor, and full-time rather than part-time. Generally, the labor force is equally split between males and females in each enterprise.

TABLE 40: FISH TRADER EMPLOYMENT

EMPLOYMENT			Units	
Item	Sample (n)	% Total	Mean	Median
FAMILY LABOR				
Male Full-Time	4	100%	1.3	1.0
Female Full-Time	4	100%	1.4	1.3
HIRED LABOR				
Male Full-Time	0	0%	0.0	0.0
Female Full-Time	0	0%	0.0	0.0
Total Sample/ Value	4	100%	2.7	2.6

2.3 OVERALL FISH VALUE CHAIN PMEP INDICATOR RESULTS

The below table summarizes baseline study results for Cambodia MSME PMEP fish value chain enterprise-level performance indicators. The first table presents overview results for the fish value chain in total and simple mean values, when this total is divided by the number of fish value chain enterprises of all value chain actor types.

TABLE 41: BASELINE STUDY RESULTS FOR THE FISH VALUE CHAIN: ALL ACTORS

Indicator		Baseline Values		
		TOTAL VALUE	SAMPLE (n)	MEAN VALUE
1	Percentage change in value of sales of project-assisted enterprise(\$/%)	\$372,356	150	\$2,482
x	Cost of business(\$/%)	\$167,293	150	\$1,115
2	Percentage change in income (gross profit= value of sales – cost of business\$/%)	\$205,064	150	\$1,367
3	Percentage change in volume of production in project-assisted enterprise (units/%)	Multiple products	150	
4	Number of full-time equivalent jobs created: (FT job equiv.= FT jobs*100% +PT jobs*50%)	380	150	2.5
5	Percentage change in investments(\$/%)	\$1,759,702	150	\$11,731

The following table presents PMEP results for the pig value chain disaggregated by the different types of fish value chain actors.

TABLE 42: BASELINE STUDY RESULTS FOR THE FISH VALUE CHAIN

	Indicator	Value Chain Actor	Baseline Values			SAMPLE (n)
			TOTAL VALUE	MEAN VALUE	MEDIAN VALUE	
1	Percentage change in value of sales	Fish Producer	\$284,261	\$1,947	\$657	146
	of project-assisted enterprise(\$/%)	Fish Trader	\$88,095	\$22,024	\$21,837	4
	Cost of business(\$/%)	Fish Producer	\$88,810	\$608	\$266	146
		Fish Trader	\$78,483	\$19,621	\$19,193	4
2	Percentage change in income (gross profit =	Fish Producer	\$195,452	\$1,339	\$221	146
	Value of sales-cost of business\$/%)	Fish Trader	\$9,612	\$2,403	\$2,643	4
3	Percentage change in volume of production	Fish Producer	626,916	4,294	800	146
	in project-assisted enterprise (units/%)	Fish Trader	143,640	35,910	31,475	4
4	Number of full-time equivalent jobs created:	Fish Producer	369	2.7	2.5	146
	(Full-time job equiv.= FT jobs*100%+PT jobs*50%)	Fish Trader	11	2.6	2	4
5	Percentage change in investments(\$/%)	Fish Producer	\$1,756,092	\$12,028	\$3,980	146
		Fish Trader	\$3,610	\$902	\$844	4

3. BRICK AND TILE VALUE CHAIN

METHODOLOGY

As compared to pig and fish enterprises, Cambodia MSME supports much larger-scale brick and tile value chain enterprises. There were a total of 28 brick and tile Cambodia MSME client enterprises in July 2009; this number grew to 37 enterprises by October 2009. Updated TAMIS client data for July shows that 25% of these enterprises were owned by women and 75% by men.

Because of their low frequency, all brick and tile enterprises within the 40 chosen districts that joined the project were sampled for the baseline. This included Cambodia MSME brick and tile enterprises in Kampong Thom that were current active clients but not yet listed in the original July 3rd client list. The sample yielded results for 15 brick and tile enterprises. Information on brick and tile value chain actors, including raw material input suppliers, wholesalers, and retailers were beyond the scope of the study, as no enterprises of these types were Cambodia MSME clients at the time of the baseline.

DEMOGRAPHIC PROFILE

The 15 Cambodia MSME brick- and tile-maker enterprises are located in rural areas, mostly in the Tonle Sap region. They are located in three provinces, 60% of which are located in Kampong Thom province.

TABLE 43: BRICK & TILE MAKER LOCATION PROFILE

	Sample	(Recent	clients	only)	TAMIS	(All	MSME	clients)
Location	(n)	% total	No. F	% F	No.	% total	No. F	% F
Rural/Urban								
% Rural	15	100%	2	100%				
Region								
Plains	2	13%	0	0%				
Tonle Sap	13	87%	2	100%				
Provinces								
Banteay MC	0	0%	0	0%	1	4%	0	0%
Battambang	0	0%	0	0%	1	4%	0	0%
Kampong Cham	2	13%	0	0%	9	32%	1	14%
Kampong Thom	9	60%	1	50%	1	4%	1	14%
Kampot	0	0%	0	0%	7	25%	1	14%
Kandal	0	0%	0	0%	1	4%	0	0%
Prey Veng	0	0%	0	0%	5	18%	3	43%
Siem Reap	4	27%	1	50%	0	0%	0	0%
Takeo	0	0%	0	0%	3	11%	1	14%
Total Sample	15	100%	2	100%	28	100%	7	100%

As for other value chain enterprises, demographic data on Cambodia MSME brick and tile maker households' was collected using a standard USAID Poverty Assessment Tool. Among brick and tile maker households 80% of household heads are male and 20% are female with a mean age of 53 years and an average household size of 5.4 persons. These households have an average of 2.6 adults who have at

least very basic literacy. On average these households had joined the Cambodia MSME project for 8.4 months at the time of the survey.

TABLE 44: BRICK & TILE MAKER DEMOGRAPHIC PROFILE

Enterprise Household Profile	Sample (n)	% Total
Demographics		
Male	12	80%
Female	3	20%
Mean household size (persons)	5.4	
Mean age of household head	53.1	
No pers. >=18 yrs can read simple message	2.7	
Mean months in Cambodia MSME project	8.4	
Total Sample	15.0	100%

3.1 BRICK AND TILE MAKERS

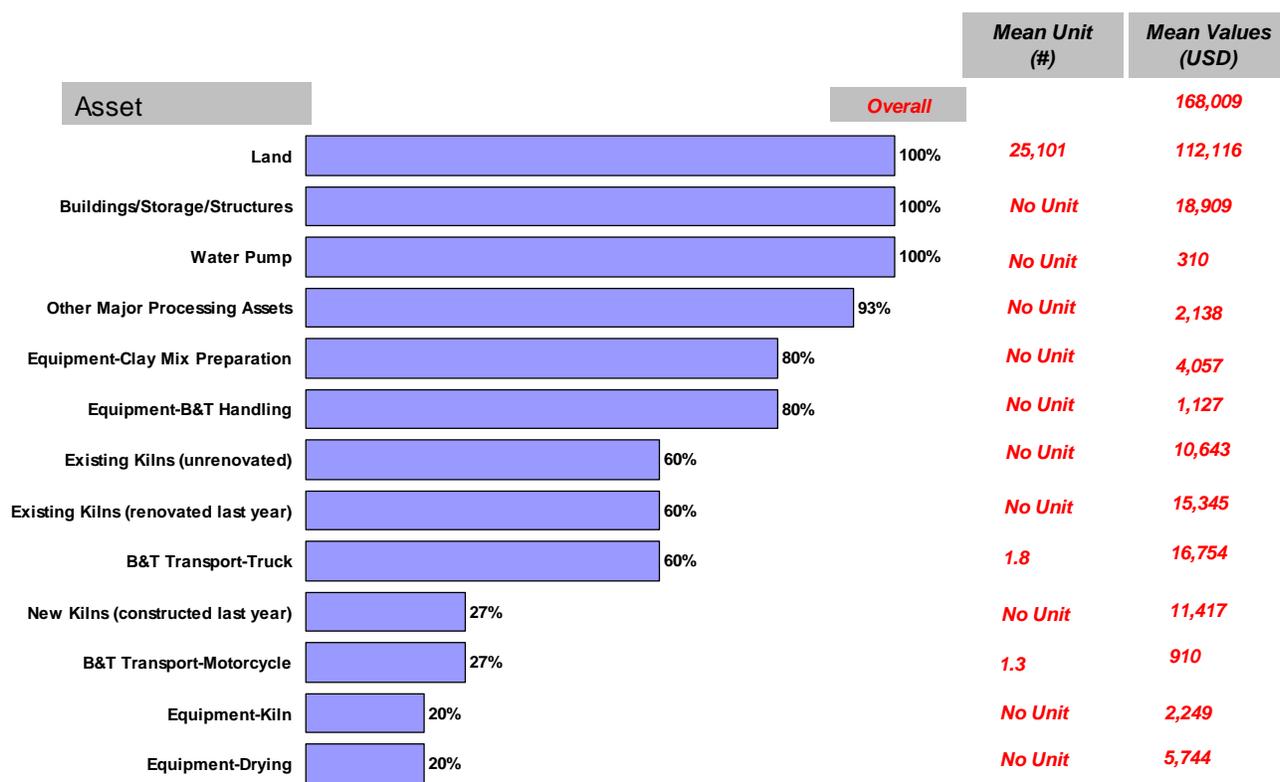
3.1.1 Value of investments by project-assisted enterprises

Brick- and tile-maker enterprises are typically much larger on average than enterprises in other value chains because they require substantial investments to operate. **The baseline mean value of the total investments is \$168,009 per brick- and tile-maker enterprise.**

Figure 12 lists these investments. The first two columns show the frequency of ownership of each type of investment among all enterprises. The next column shows the mean number of units owned by type, among enterprises that own that type investment. The last column shows the mean value of units owned of each type, among enterprises that do own that type of investment.

All enterprises have invested in land with a mean area of 25,101 m², valued at \$112,116. On average, land investment represent about two-thirds of total investment for these enterprises. This land is expensive and may reflect higher road-side and peri-urban land prices where these enterprises are typically located. Other major investments made by all enterprises include buildings/storage/structures with a mean value of \$18, 909, and kilns: either existing un-renovated kilns for 60% of enterprises with a mean of \$10,643; existing kilns renovated during the last year for 60% of enterprises with a mean of \$15,345; new kilns constructed within the last year for 27% of enterprises with a mean of \$11,417. Other common major investments include equipment for clay mix preparation for 80% of enterprises with a mean of \$4,057, and truck transport for 60% of enterprises with a mean of \$16,754.

FIGURE 12: BRICK & TILE MAKER INVESTMENTS

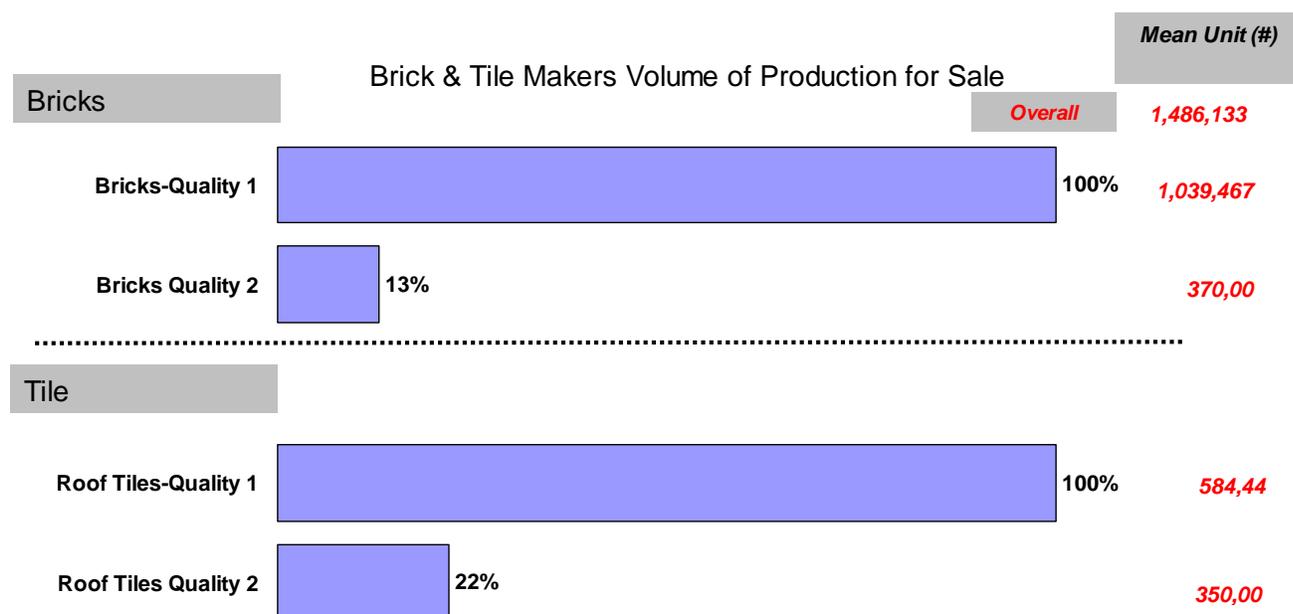


3.1.2 Volume of production of project-assisted enterprises

Brick- and tile-maker enterprises typically produce a combination of bricks and tiles for sale. All enterprises produce bricks and 60% also produce tiles. The PMEP indicator for brick and tile makers’ volume of production is split into brick and tile production volumes per enterprise. **The baseline mean volume of production of bricks for sale is 1,088,880 bricks per brick and tile enterprise. The baseline mean volume of production is 662,222 tiles per enterprise engaged in tile production.**

The breakdown of the total volume of production of bricks and tiles for sale by type is shown in Figure 13. All enterprises make Quality 1 bricks for sale, with a mean volume of 1.04 million bricks per enterprise. In addition, 13% of enterprises produce Quality 2 bricks for sale, with a mean volume of 370,000 per enterprise. Only roof tiles were produced among the nine tile-producing enterprises. All enterprises produced Quality 1 roof tiles, with a mean production volume of 584,444 tiles per enterprise. Additionally, 22% of enterprises produced Quality 2 roof tiles with a mean production volume of 350,000 tiles per enterprise.

FIGURE 13: BRICK & TILE MAKER VOLUME OF PRODUCTION FOR SALE



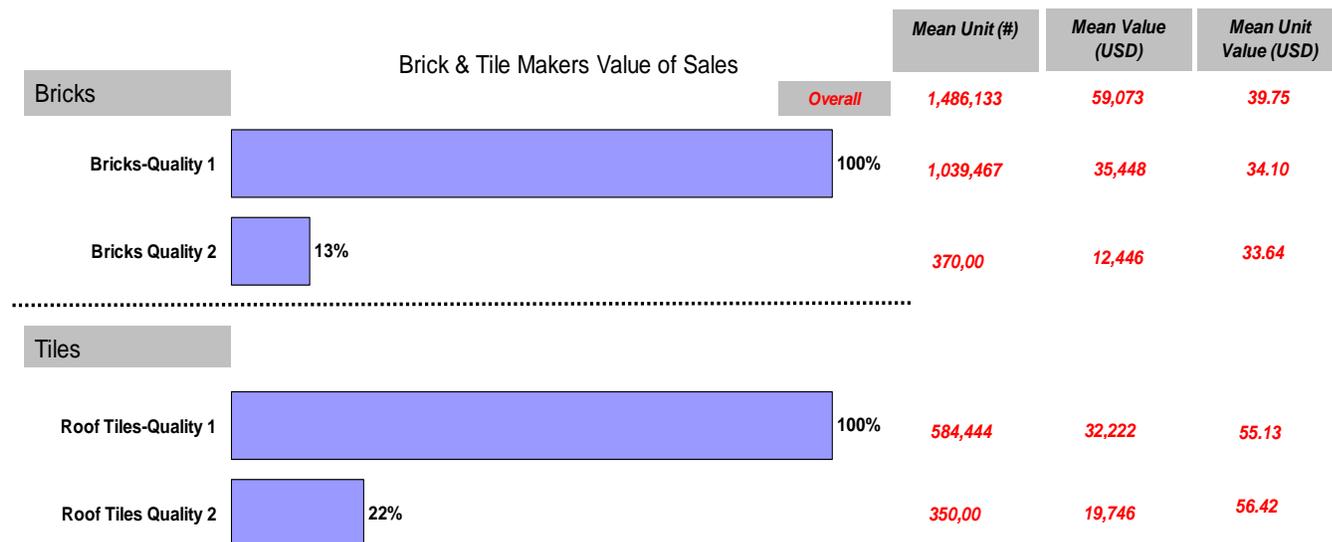
3.1.3 Value of sales of project-assisted enterprises

Another Component One PMEP indicator is the “Percentage change in value of sales of project-assisted enterprises”. In volume of sales, the PMEP indicator for brick and tile makers’ value of sales is split into brick and tile sales values per enterprise. **The baseline mean value of brick sales is \$37,108 per Cambodia MSME enterprise. The baseline mean value of tile sales is \$36,610 per Cambodia MSME enterprise engaged in tile production.**

The breakdown of the total value of sales per brick- and tile-maker enterprise is shown in Figure 14. For reference, the volumes of sales, discussed in the previous section, are also included in the figure. All enterprises sold Quality 1 bricks, for a mean value of sales of \$35,448. 13% also sold Quality 2 bricks, for a mean value of sales of \$12,446. The total mean value of brick sales of all types is \$37,108 per enterprise.

Nine, or 60%, of enterprises also sold Quality 1 roof tiles for a mean value of sales of \$32,222, and 22% of tile-selling enterprises also sold Quality 2 roof tiles, for a mean value of sales of \$19,746. The total mean value of roof tile sales of all types is \$36,610 per enterprise.

FIGURE 14: BRICK & TILE MAKER VALUE OF SALES



Unexpectedly, for both brick and roof tile sales on average, there is no price premium evident for Quality 1 products versus Quality 2 products as shown by the unit prices. This trend reflects a wide variation in sale unit prices between enterprises. For Quality 1 bricks prices per 1,000, bricks varied from a low of \$21.54, to a high of \$47.87. For Quality 1 tiles prices per 1,000, tiles varied from a low of \$43.08, to a high of \$71.80. The reasons for these variations may relate to further differences in types, quality standards of brick and tile products, or regional or enterprise-level variations in markets. These issues should be explored further to promote value chain development.

Price premiums were evident for only the two firms selling both Quality 1 and Quality 2 products. In one enterprise selling both types of bricks, Quality 1 bricks sold for \$29.92/’000, compared to Quality 2 bricks, which sold for \$23.93/’000. In the second enterprise, Quality 1 bricks sold for \$43.08/’000, as compared to Quality 2 bricks that sold for \$35.90/’000. Among two other enterprises selling both types of tiles, one sold Quality 1 tiles for \$71.80/’000 as compared to its Quality 2 tiles that sold for \$59.84/’000. In the second enterprise, Quality 1 tiles sold for \$71.80/’000, as compared to Quality 2 tiles that sold for \$35.90/’000.

3.1.4 Cost of business and income of project-assisted enterprises

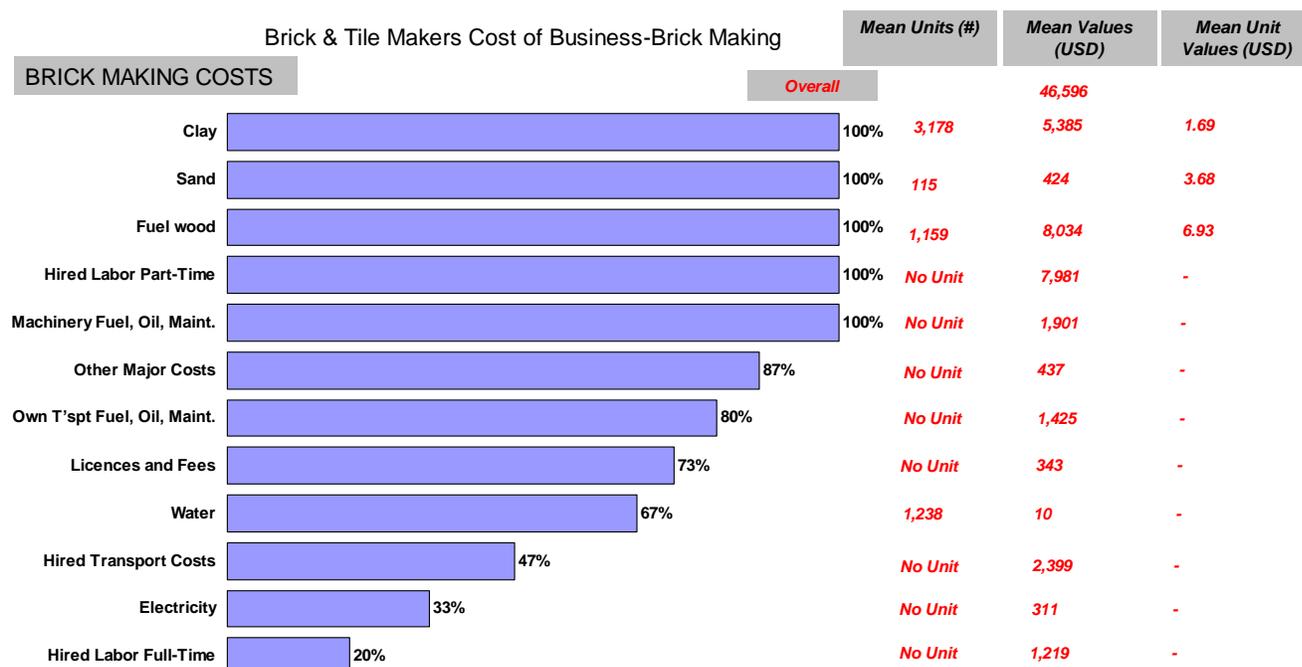
This section examines costs of business for fish production in order to determine the PMEP Indicator of fish enterprise income. Income is defined as the value of annual sales, minus the annual cost of business.

Cost of Business

The costs of business for brick- and tile-maker enterprises is sub-divided into brick and roof tile costs. **The mean overall cost of business for brick making is \$26,596 per enterprise.**

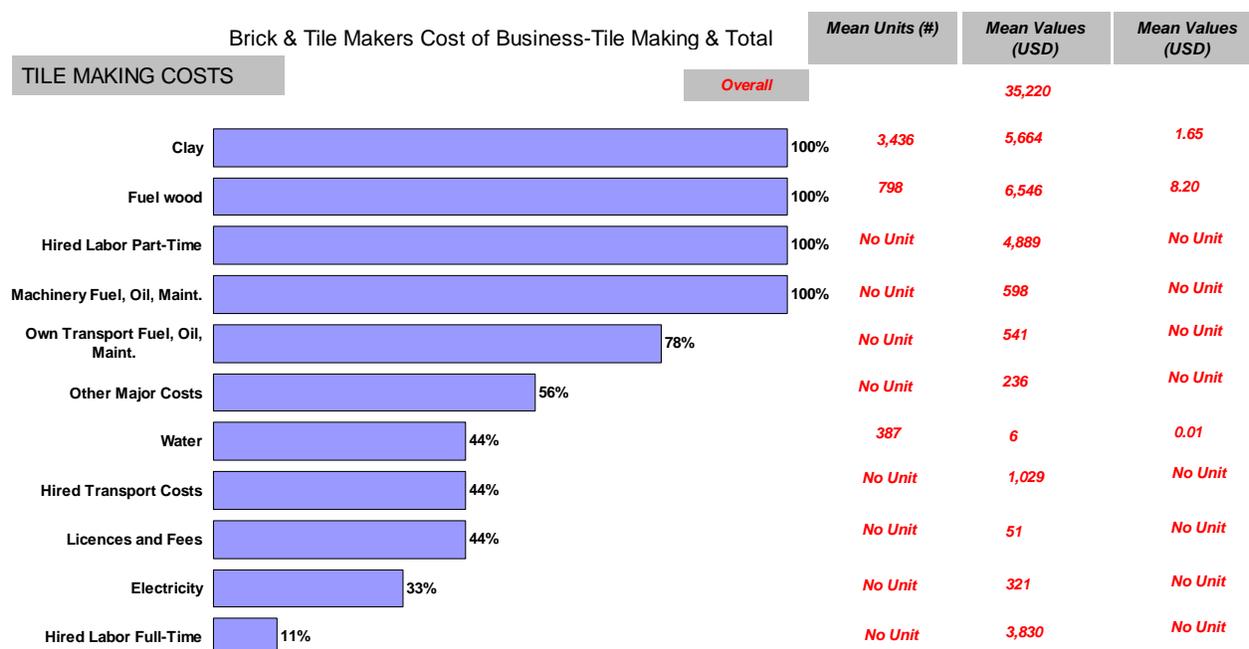
Figure 15 below shows the baseline cost of brick making. Universal and major costs for brick making include clay mean \$5,385, fuel wood mean \$8,034, and hired part-time labor mean \$7.981.

FIGURE 15: BRICK & TILE MAKER COST OF BUSINESS-BRICK MAKING



The mean overall cost of business for roof-tile making is \$14,373 per tile making enterprise. Table 58 below shows the baseline cost of roof-tile making. Universal and major costs for roof-tile making are similar to those for brick making. These include clay at a mean of \$5,664, fuel wood at a mean of \$6,546, hired part-time labor at a mean of \$4,889, and hired full-time labor at a mean of \$3,830.

FIGURE 16: BRICK & TILE MAKER COST OF BUSINESS-TILE MAKING & TOTAL



Income

Table 45 below shows the baseline-income results derived by subtracting cost of business from total value of sales, including a breakdown for brick and roof-tile income. **The baseline mean value of total enterprise income is \$23,854 per Cambodia MSME brick- and tile-maker enterprise.**

TABLE 45: BRICK & TILE MAKER INCOME

TOTAL INCOME-BRICK & TILE MAKER			Values (USD)	
Item	Sample (n)	% Total	Mean	Median
BRICK MAKING(n=15)				
TOTAL VALUE OF SALES			\$ 37,108	\$ 25,850
TOTAL COST OF BUSINESS			\$ 26,596	\$ 17,011
Income Sub Total			\$10,152	\$8,839
TILE MAKING (n=9)				
TOTAL VALUE OF SALES			\$36,610	\$22,020
TOTAL COST OF BUSINESS			\$ 14,373	\$ 10,931
Income Sub Total			\$22,237	\$11,089
TOTAL				
TOTAL VALUE OF SALES			\$ 59,073	\$ 36,620
TOTAL COST OF BUSINESS			\$ 35,220	\$ 22,240
Total Sample/ Income	15	100%	\$23,854	\$ 14,380

3.1.5 Other productivity indicators for project-assisted enterprises

The baseline survey included brick and tile productivity indicators that were considered important but are not included in the PMEP indicator matrix. These indicators include respondent estimates on percentages of broken products per batch, batch production cycle length in days, and total sales per month.

Table 46 contains these indicators of productivity. On average, an estimated 7% of both brick and tile products are broken, meaning they cannot be sold. This percentage represents a large product loss. Causes of this level of breakages during brick and tile production should be explored, and Cambodia MSME support should aim to reduce the percentage of broken items to boost productivity.

The brick production cycle per batch lasts for an average of 39 days, and the tile-production cycle lasts 78 days. Average brick sales per month are estimated at just under 100,000, and tile sales at almost 43,000 per month. These average sales per month are broadly consistent with the yearly production estimates presented in the volume of sales data above.

TABLE 46: BRICK & TILE MAKER PRODUCTIVITY INDICATORS

Item	Sample (n)	% Total	Units	
			Mean	Median
Brick Maker				
Bricks % Broken	15	100%	7%	3%
Brick Batch Prod. Cycle-days	15	100%	39	30
Brick Sales Per Month	15	100%	98,974	70,000

Item	Sample (n)	% Total	Units	
			Mean	Median
Total Brick	15	100%		
Tile Maker				
Tiles % Broken	9	100%	7%	5%
Tile Batch Prodn Cycle-days	9	100%	78	90
Tile Sales Per Month	9	100%	42,862	33,000
Total Sample/ Value	9	100%		

3.1.6 Number of full-time equivalent jobs of project-assisted enterprises

A final Component One PMEP indicator is the “Number of full-time equivalent jobs created”, measured in number of jobs per enterprise where all full-time jobs, as well as 50% of all part-time jobs, are counted towards the indicator. **The baseline number of full-time equivalent jobs per Cambodia MSME brick and tile enterprise is 11.8.**

The brick and tile enterprise labor force is mainly hired labor, with family labor also involved. Hired labor includes more females than males, while family labor includes more males than females.

TABLE 47: BRICK & TILE MAKER EMPLOYMENT

Item	Sample (n)	% Total	Units	
			Mean	Median
FAMILY LABOR				
Male Full-Time	14	93%	1.5	1.5
Female Full-Time	10	67%	1.0	1.0
HIRED LABOR				
Male Full-Time	15	100%	7.1	6.0
Female Full-Time	15	100%	11.4	9.0
Total	15	100%	11.8	10.0

3.2 OVERALL BRICK AND TILE VALUE CHAIN PMEP INDICATOR RESULTS

The baseline study results for all brick and tile enterprise-level performance indicators outlined in the Cambodia MSME PMEP are summarized in the table below. As there is only one type of actor in this value chain, only one summary table is required for value chain and value chain actor level results.

TABLE 48: BASELINE STUDY RESULTS FOR THE BRICK AND TILE VALUE CHAIN

	Indicator	Value Chain Actor	Baseline Values			SAMPLE (n)
			TOTAL VALUE	MEAN VALUE	MEDIAN VALUE	
1	Percentage change in value of sales of project-assisted enterprise(\$/%)	Brick & Tile Makers	\$886,101	\$59,073	\$36,620	15
	Cost of business(\$/%)	Brick & Tile Makers	\$528,293	\$35,220	\$22,240	15
2	Percentage change in income (gross profit= value of sales – cost of business\$/%)	Brick & Tile Makers	\$357,808	\$23,854	\$14,380	15
3	Percentage change in volume of production in project-assisted enterprise (units/%)	Brick & Tile Makers	22,292,000	1,486,133	1,380,000	15
4	Number of full-time equivalent jobs created: (full-time job equiv.= FT jobs*100%+PT jobs*50%)	Brick & Tile Makers	308	11.8	10	15
5	Percentage change in investments(\$/%)	Brick & Tile Makers	\$2,520,134	\$168,009	\$158,844	15

4. WILD HONEY BEE VALUE CHAIN

METHODOLOGY

Cambodia MSME supports USAID/Cambodia Biodiversity Objectives for sound management of areas of biological importance through activities that reduce threats to biodiversity in priority areas, and promote sustainable conservation practices by local communities and government agencies. Project activities in the wild honey bee value chain support these objectives, and recognize honeybees as keystone species that are crucial to the maintenance, sustainability and improvement of habitat biodiversity.

In May 2009, Cambodia MSME conducted a honey value chain assessment as an initial effort to estimate of the number of colonies of various species of honeybees harvested in Cambodia.⁶ The study found that generally, wild honey harvesting is village-based, with very low standards of quality and hygiene. Supply chain linkages are informal, and lack information flow back to producers. Regulations exist, but are neither appropriately designed, nor consistently applied. Few non-governmental organizations and private companies develop the supply chain, and there is a lack of access to high-priced niche markets. However, the honey value chain has income potential, and the initial estimate of volume of production is high, given market demand. The study ranked the area of Kampong Soam Bay as the area with best immediate prospects for a biodiversity conservation program and honey value chain improvement.

Following this assessment, Cambodia MSME commissioned Crossroads To Development to conduct a baseline survey⁷ of honey-hunting communities in the districts of Srea Ambel and Botum Sakor in Koh Kong Province, in August 2009.⁸ The study areas in the 2 districts and 5 communes comprised 10 villages, with a total household population of 1,800. The following data collection methods were used:

- Household surveys using structured questionnaires, among 120 households in the five communes;
- Five focus-group discussions in five communes, with a total of eighty-seven participants;
- Nine key-informant interviews with respondents, including honey hunters; collectors; traditional medicine sellers; a honey-wine maker; government agencies, such as the Forestry Administration and the Ministry of Environment; NGOs, including CEDAC, AFSC, Khmer Ahimsa and CBC Ltd. MAFF, Pact, and others.
- Three ecological walks in distinct ecosystems within the study area, including the wetland *Melaleuca* forest, the mangrove forest and the upland *Dipterocarp* forest.

The study focused on honey-harvesting households as the main supply chain production unit. Value chain information related to post-harvest processes at the level of the wholesaler and the market outlet were beyond the scope of the study.

⁶ *Cambodia Honey Value Chain Assessment*, Meang Sotha and Andrew McNaughton for the Cambodia MSME2/BEE project, May 2009.

⁷ *Wild Honey Bee Baseline Survey*, Crossroads To Development, August 2009.

⁸ Koh Kong province is located within the Botum Sakor National Park and the Dang Peng Multiple-Use Area, both parts of the Biodiversity Conservation Corridors of the Cardamom Mountains.

Demographic profile

The Baseline survey sampled 120 households, with 72 project participants and 48 non-participant households as a control area. Respondents estimated that a total of 241 honey harvesting households were located in the study area. This baseline summary report analyzes only data for project participants, and will be compared to data collected during the mid- and end-line surveys of the same households.

TABLE 49: SAMPLE COMMUNES, VILLAGES AND HOUSEHOLDS

Classification	District	Commune	Village	N° of Households Sampled
Project Area Villages	Botum Sakor	Andong Tuek	Ta Meak	24
	Srae Ambel	Dang Peng	Prang	13
			Preah Ang Keo	11
		Srae Ambel	Chamkar Kroam	24
Sub-total:				72
Non-Project Area Villages	Botum Sakor	Kandoal	Pralean	9
			Thnong	9
			Ta Kan	5
			Kandoal	1
	Srae Ambel	Chrouy Svay	Chrouy Svay Lech	14
			Chrouy Svay Ket	10
Sub-total:				48
Total Sample				120

The household survey and focus group discussions revealed that all honey harvesting households in the study area gather forest products to supplement their income, with firewood, plants, animals, birds, mushrooms and bees being the most common non-timber forest products collected. Honeybee livelihood is therefore supplemental, and most activities are done part-time during peak harvest months, from June to August.⁹ Whole hives, the honey head, honey, brood and wax are harvested. Due to their medicinal and food supplement value, honey and wax are the most commonly sold products.

The predominant type of honey gathering is opportunistic, which means that honey is harvested in its natural hive. However, 34% of households have shifted towards more sustainable practices: rafter use, honey head harvesting, the use of a plastic bag for transporting honey head, group harvesting, collection of honey for bulk sales, and setting up cluster groups with defined areas for rafter installation.

The market for honey products is not well established and is still limited to local communities. Local demand accounts for 0.5-2 liters per household, with free-sharing and low-cost sales. Sales to consumers at the Srae Ambel market and traders account for 700 liters of honey at \$3.75-\$5.00 per liter. The Prang Honey Association serves as trader and collector of honey, buying at \$6.50 per liter from its members and selling at \$9.13 per liter after the raw product has undergone filtration. Currently, its sole buyer is the

⁹ Honeybees are present in the area from the March to November., The peak season for harvesting, however, occurs during June or July, until August. A small number of households (25-28%) may engage in an early harvest in May or late harvest in September; however, the majority of household respondents (62% to 94%) harvest during the peak season.

Cambodian Centre for Study and Development in Agriculture (CEDAC) in Phnom Penh, which provided a purchase order for 300 liters in 2009.

The supply chain activities are limited to honey-hunting in the forest, rafter preparation, household processing of harvested honey head, and sales of cleaned or pressed product. Table 50 illustrates that across the study sample of 72 households, 80% of respondents are hunters, 10% process honeybee products, 8% collect honeybee products from other harvesters, while another 2% trade honeybee products. Honey hunting is commonly done by the male head of household, and male household members. Female roles are usually confined to simple processing, like extracting the honey, and separating the brood and wax if the whole hive is harvested.

TABLE 50: HOUSEHOLD MEMBERS: HONEYBEE LIVELIHOOD ACTIVITIES

Sample = 72 HHs	Number of members	Percent of the total
Number of household members involved in honeybee livelihood?		
Father	65	74%
Mother	3	3%
Male youths (18-24)	14	16%
Female youths (18-24)	1	1%
Male children (under 18 yrs)	5	6%
Total:	88	100%
Activities related to honeybee livelihood		
Hunter	70	80%
Processor	9	10%
Collector	7	8%
Trader	2	2%
Total Members	88	100%

4.1 HONEY-HARVESTING HOUSEHOLDS

4.1.1 Value of investments by project-assisted households

The majority of households interviewed predominantly harvest wild honey by chance – if one sees a colony, he will harvest the honey by himself or call other harvesters to help harvest it. As mentioned earlier, only 34% of households involved in honey livelihood practice rafter methods. As shown in Table 51, among the project participant households surveyed, a total of 32 rafters were installed at the time of the survey. 78.1% of those were two pole rafters, with the rest of the households using two pieces of wood that resemble a lowercase *r*, or a natural tree branch covered with bee wax.

TABLE 51: TYPES, NUMBER OF RAFTERS, AND RATE OF OCCUPANCY

Sample = 72 households	Sample (n)	%
Number of rafters installed/ owned at present by surveyed households?		
Total	32	
Median	15	
Types of rafters installed?		
Two pole rafter	25	78.1

Sample = 72 households	Sample (n)	%
Two pieces of wood that resemble the letter "r"	8	25
Natural tree branch wiped with bees wax	2	6.3
Total	32	100
Number of rafters occupied in one season?		
Total	30	
Median	5	

Rafter installation is a key investment. The price of setting up a rafter, however, is very low—estimated at about \$0.5 for each rafter, to be used during two harvesting seasons. The material—two 10-12 cm in diameter tree branches—is locally sourced from the habitat, which complicates cost estimates. Using an approximate cost of \$0.5 per rafter, the total **baseline value of rafters installed by the 72 households at the time of the survey is \$16**. The actual number of rafters installed is a more accurate indicator of the baseline level of investment, and is included in the indicator summary table below.

4.1.2 Volume of production of project-assisted households

Households that harvest honeybee products in the target area collect honey head with wax, measured in kilograms. Following the harvesting, honey head is pressed to extract honey, measured in liters, leaving only wax, measured in kilograms. Survey respondents estimated the total volume of honeybee products harvested per household during the June through August 2009 harvesting season.

Of the sample of 72 households, not all respondents were able to estimate or willing to provide information on their production volumes. Therefore, the survey sample varies for each honeybee product. Results are summarized in Table 52 below. The median was used to eliminate outliers. **Overall, in target areas, a median of 7 kg of honey was harvested in the 2009 season by each of the 62 respondents. A median of 5 liters of honey was extracted by 67 respondent households, and a median of 1 kg of wax was saved or sold by 42 households. Total estimates of 2009 production volumes for those who responded include 434 kg of honey head, 335 liters of honey, and 42 kg of wax.**

TABLE 52: VOLUME OF HONEY PRODUCT COLLECTED IN 2009

	Unit	Sample (number of respondents to this question)	Median	Estimated total volume
Honey head	kg	62	7	434
Honey	liters	67	5	335
Wax	kg	42	1	42

4.1.3 Value of sales of project-assisted households

As described in Table 53 below, the majority of surveyed households sell honeybee products to traders (48.6%) and to honeybee committees in the villages (54.2%). Collectors also play a role—they provide 18.1% of harvesters with easier access to market. 6.9% of households sold products to wholesalers and 9.7% sold inside the community, while 4.2% stated they do not have a market for their products.

TABLE 53: MARKET OUTLETS

	Number of Households	%
Point of sale for honeybee products (multiple responses).		
Trader	35	48.6
Village	39	54.2
Collector	13	18.1
Wholesaler	5	6.9
Community	7	9.7
None	3	4.2
Total Households	72	100

The price of honeybee products differs from location to location. Median prices of honeybee products at the time of the survey are shown in Table 54. The honey head, sold in kilograms, has a median price of \$4, which is customarily bought by the Honey Association for the same amount. A liter of honey has a median price of \$5 and is sold to local consumers and markets for a range of \$3 to \$5. Wax, the most expensive product, has a median of \$5, according to the household survey. The price of wax in the local market, however, was estimated at \$6 to \$7.50 per kilogram.

TABLE 54: MEDIAN CURRENT PRICES OF HONEYBEE PRODUCTS (MARKET DATA)

Median Current Prices Honeybee Products (\$)			Selling Price to Traders (\$)	
Product	Unit	Survey area	Local Consumer/ Trader/Srae Amble Market	Honey Association (2009)
Honey head	kg	4.00	-	4.00
Honey	liter	5.00	3.00-5.00	-
Wax	kg	5.50	6.00-7.50	-

Instead of calculating total sales by multiplying production volumes by median price, researchers used respondent estimates of annual earnings from honeybee livelihood activities, detailed below, as an indicator for both sales and income. There are several reasons for this calculation: the low cost of honeybee harvesting; the fact that most of the honey products harvested are sold; and a higher respondent rate for the question on annual earnings, as compared to the question on production volumes, discussed above.

4.1.4 Cost of business and income of project-assisted households

Costs of honey-gathering activities are very low, which complicates the estimation of cost of business and income. These costs include very basic honey gathering tools, such as knives, a plastic bag and a walk in the forest for the gatherer. Comb-pressing costs are also low. Additional costs might include the purchase of a drip and stock container, and transport costs to market. At the time of the survey, however, these costs were born by the Honey Association, and not by the honey producing households.

Household-earnings estimates from honeybee livelihood activities in the current (2009) and the previous (2008) seasons are presented in Table 55 below. Out of the 72 households sampled, 69 provided responses to this question. **Comparing earned income from the previous year against the present season, the data shows that households performed better during the previous year. The median for**

the previous season was \$37.50, compared to only \$20.00 in the current season. The total value was \$4,085 in 2008, versus \$2,339 in 2009. This difference, however, can be attributed to the fact that the current season had not yet ended at the time of survey.

TABLE 55: EARNINGS COMPARISON FROM HONEYBEE LIVELIHOOD ACTIVITIES

	Value per household (sample=69 HHs)	Total Value
Earnings from honeybee livelihood activities in previous season (2008) (\$)		
Mean	\$ 59.20	\$ 4,085
Median	\$ 37.50	
Earnings from honeybee livelihood activities in current season (2009) (\$)		
Mean	\$ 33.90	\$ 2,339
Median	\$ 20.00	

4.1.5 Number of full-time equivalent jobs of project-assisted households

Honeybee livelihood activities are supplemental income earning activities for the majority of households, as it is a seasonal activity. During the harvesting season, only 16% of households had family members who spent most of their time on honey harvesting, and only 15% engaged in it on a full time basis. All other household members cite part-time engagement, as listed in Table 56. This is indicative of the fact that honey-related activities are largely opportunistic.

TABLE 56: HOUSEHOLD MEMBER TIME INVOLVEMENT IN HONEYBEE LIVELIHOOD ACTIVITIES

	Part-time	Full-time	Total
Number of household members involved in honeybee livelihood?			
Father	56	9	65
Mother	3	0	3
Male youths (18-24)	12	2	14
Female youths (18-24)	1	0	1
Male children (under 18 yrs)	5	0	5
Total Sample/ Value	77	11	88

Overall, for the 72 households surveyed, 88 household members engaged in honeybee livelihood activities: 11 on a full-time basis, and 77 on a part-time basis.

4.2 OVERALL HONEY BEE VALUE CHAIN PMEP INDICATOR RESULTS

The baseline study results for all honey bee harvesting households surveyed are summarized in the table below.

Baseline study results for the Wild Honey Bee Value Chain

Indicator		Comments	Baseline Values			
			TOTAL VALUE	MEAN VALUE	MEDIAN VALUE	SAMPLE (n)
1	Percentage change in value of sales of project-assisted enterprise (\$/%)	2009 season	\$2,339	\$33.90	\$20.00	69
		2008 season	\$4,085	\$59.20	\$37.50	69
	Cost of business (\$/%)		\$0			69
2	Percentage change in income (gross profit= value of sales - cost of business \$/%)	2009 season	\$2,339	\$33.90	\$20.00	69
		2008 season	\$4,085	\$59.20	\$37.50	69
3	Percentage change in volume of production in project-assisted enterprise (units/%)	Honey Head (kg)	434		7	62
		Honey (liter)	335		5	67
		Wax (kg)	42		1	42
4	Number of full-time equivalent jobs created: (full-time job equiv. = FT jobs * 100% + PT jobs * 50%)		49.5	0.7		72
5	Percentage change in investments (\$/%)	Number of rafters installed	32		15	72
		Value of rafters installed	\$16			72

WSP. To address this challenge, WSPs surveyed are categorized into three groups, with responses presented separately for each group, to ensure accuracy. The baseline data gathered for private WSPs is presented separately for the following categories of WSPs:

- **SMALL:** between 125 and 450 household connections
- **MEDIUM:** between 450 and 950 household connections
- **LARGE:** more than 950 household connections

Out of the 35 WSPs surveyed, 13 belong to the first category, 12 to the second one and 10 to the third category. Also, within the third category, the size of 3 WSPs is significantly higher than of the rest, leading to a distortion of survey results.

TABLE 57: SURVEYED WSPS – BY CATEGORY AND BY PROVINCE

Location (9 Provinces)	Small	Medium	Large
Kandal	2	1	5
Takeo	5	2	1
Kampong Cham	2	2	1
Battambang		3	1
Kampong Speu	2		2
Kampot	1	1	
Kracheh	1	1	
Kampong Thom		1	
Siem Reap		1	
Total Sample	13	12	10

Most large WSPs have operated for a long time, while a few started their businesses recently. Most small-sized WSPs started before 2004, and the majority of medium-sized WSPs started operations after 2005. 75% of all WSPs surveyed had a single owner at the time, and the remaining 25% are family- or shareholder-owned. Most WSPs engage in other business activities, in addition to water service provision: electricity provision, other water-related businesses, and transport services.

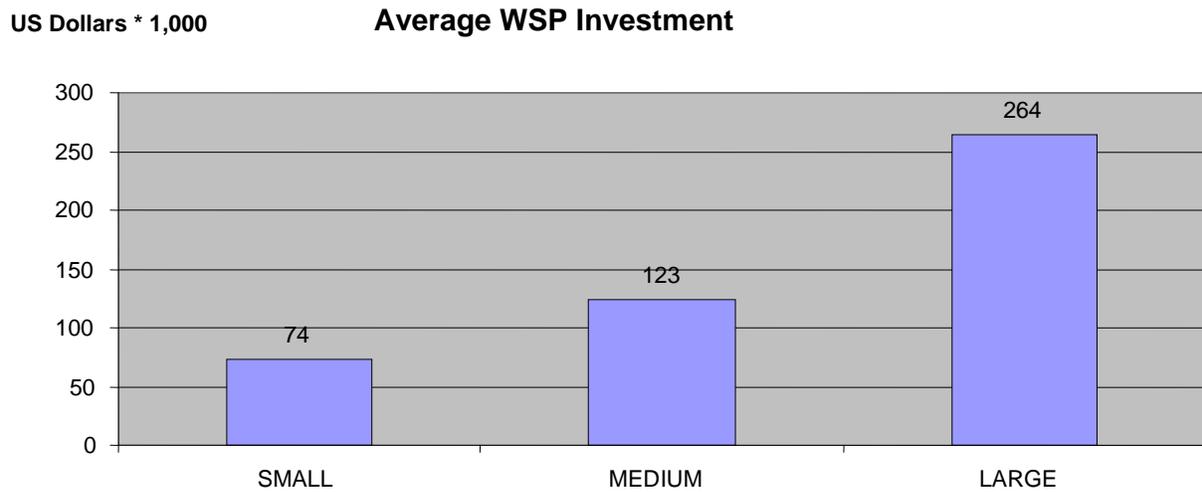
WSPs operate during wet and dry seasons, and use various water sources, such as wells, ponds, and the main source, rivers. Large WSPs have long, extended piped systems, and rely almost exclusively on pumping river water, while small WSPs rely on locally excavated ponds. Common constraints to productivity cited by most WSP are water loss, due to leakages in piped system; and inaccuracy of household meters, often resulting in inaccurate production volume measurements.

5.1 WATER SUPPLY SERVICE PROVIDERS

5.1.1 Investments by project-assisted enterprises

WSPs were estimated the amount invested in their business since its start, and excluded operating costs, including only initial start up investment, replacement costs, and expansion. **On average, as of the date of the survey, small water service providers invested \$74,000, medium providers invested \$123,000, and a large providers invested \$264,000.** These figures include land investment, building construction, connection to electricity grid, pipes, fittings, meters, and equipment.

FIGURE 18: WSPS AVERAGE WSP INVESTMENT

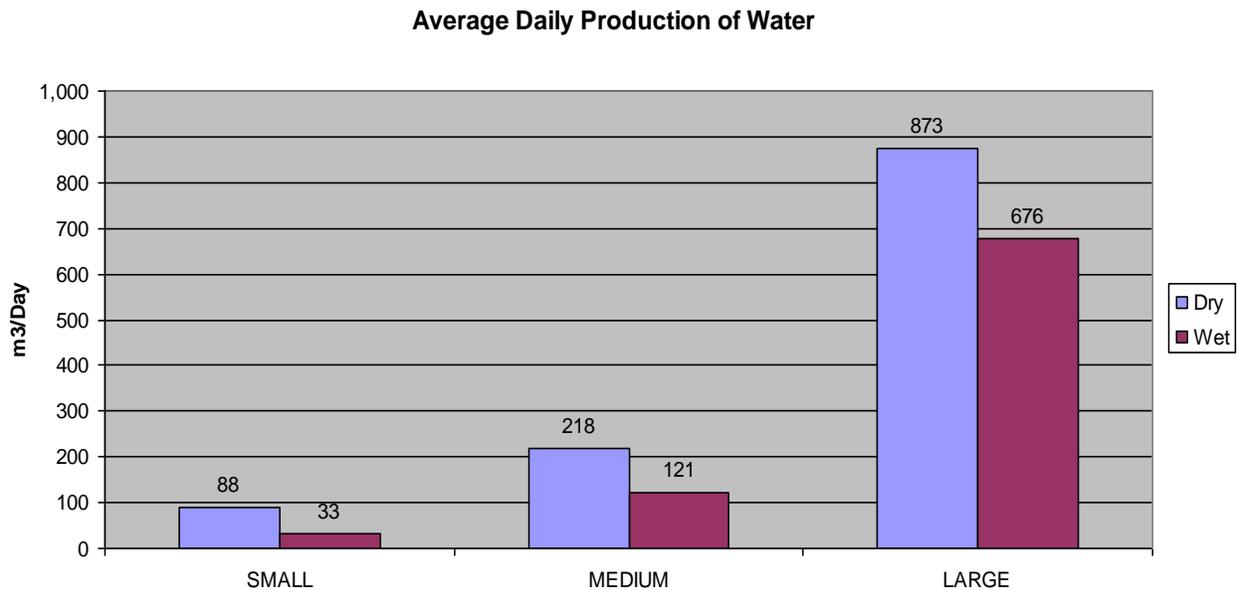


5.1.2 Volume of production of project-assisted enterprises

Volume of production for WSPs is defined as the quantity of water produced measured in cubic meters per day. The average daily production data for each WSP was gathered separately for dry and wet seasons.

On average, a small WSP produced 88 m³ of water per day in the dry season, and 33 m³ in the wet season. Medium-sized WSPs produced an average of 218 m³ of water per day in the dry season, and 121 m³ in the wet season. Average daily production for large WSPs was 873 m³ per day in dry season and 676 m³ in wet season.

FIGURE 19: AVERAGE DAILY PRODUCTION OF WATER

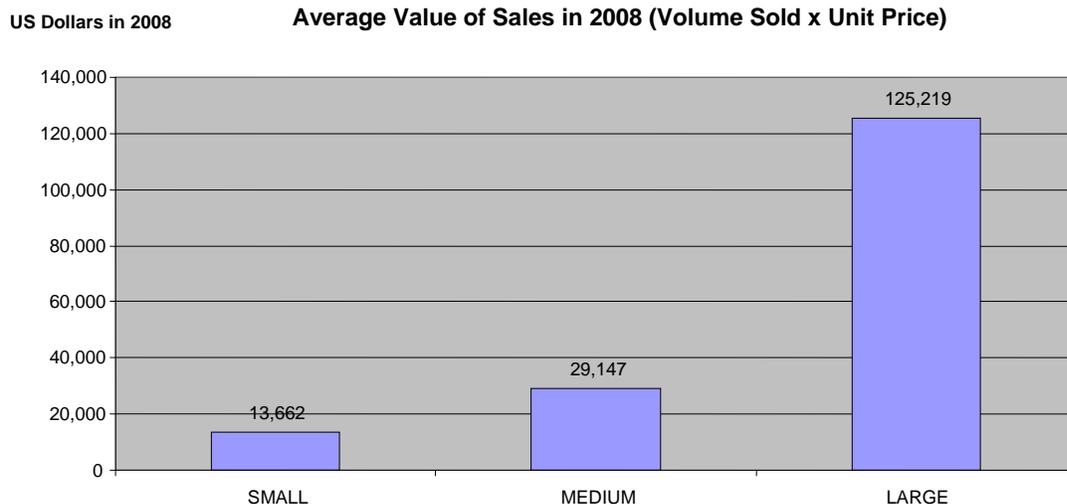


Estimating accurate production volumes for WSPs is challenging because most rely on the volume sold to estimate production volumes. All WSPs, however, admitted to water loss in their piped system. As a result, most WSPs probably have inaccurate data on their own production volumes.

5.1.3 Value of sales of project-assisted enterprises

The data on the value of sales for surveyed enterprises was not requested directly for the survey, but was calculated by multiplying the declared “volume sold” by the declared “unit sale price”. This data was gathered for 2008. **The average value of 2008 sales for WSPs belonging to each of the three categories is presented below. In 2008, it was \$13,662 for small WSPs, \$29,147 for medium-sized WSPs, and \$125,219 for large WSPs.**

FIGURE 20: WSP AVERAGE VALUE OF SALES

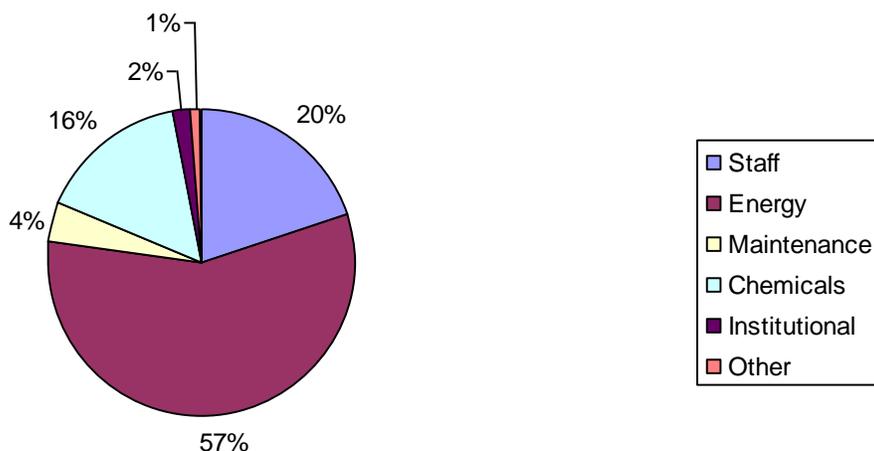


5.1.4 Income of project-assisted enterprises

For the baseline study, researchers defined income as “calculated cash flow”—an approximation of end-of-year retained money, before any investment. They calculated income as the total value of sales for 2008, minus operating costs. Operating costs for WSPs included staff costs, energy, maintenance, chemicals, and other costs. Energy was the main operating cost for all WSPs, regardless of size.

FIGURE 21: AVERAGE OPERATING COST PER MAIN COMPONENT

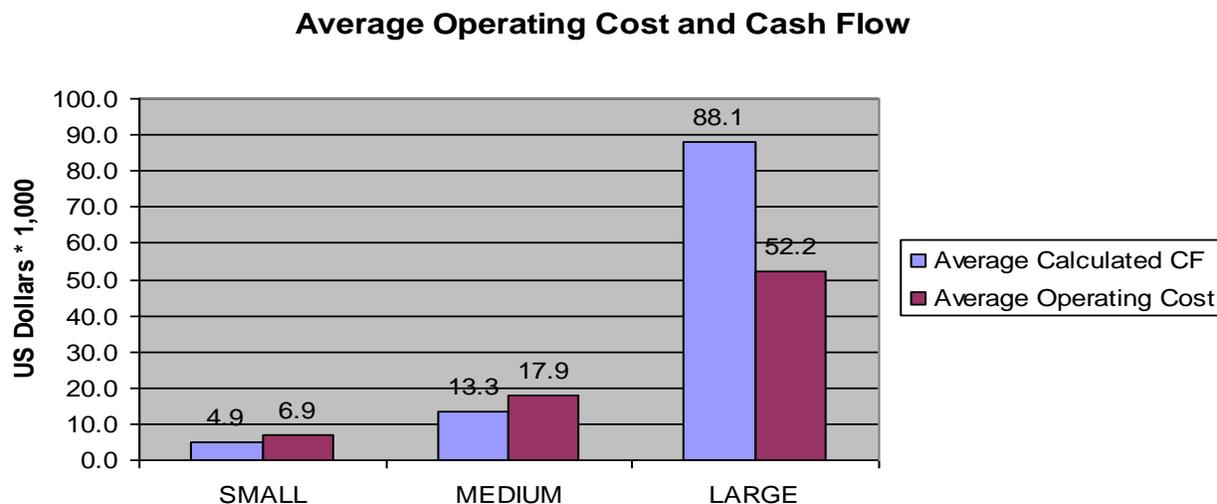
Average Operating Cost per main Component



Analysis of operating costs of WSPs was complicated by the lack of reliable information provided by some respondents. In some cases, for example, respondents declared cost of staff as zero when only family members ran the business. Such inconsistencies complicated the comparison across respondents. Due to these challenges, only 23 WSPs were retained for further analysis of income (or “calculated cash flow”). The income indicators provided below were gathered for only 23 of the 35 surveyed WSPs, representing 10 small, 7 medium and 6 large WSPs.

For small, medium and large WSPs, the average income (“calculated cash flow”) in 2008 is presented below. For a small WSP, this figure was \$4,900, for a medium one it was \$13,300, and for a large one it was \$88,100.¹¹

FIGURE 22: AVERAGE OPERATING COST AND CASH FLOW



5.1.5 Number of full-time equivalent jobs

The study found that a majority of small WSPs have full-time employees. This percentage increased with the size of the business, and rose to 100% for large WSPs.

At the time of the study, all WSPs surveyed employed 160 full-time, and 14 part-time employees. **167 full-time equivalent jobs were therefore calculated within the sample surveyed.**

TABLE 58: NUMBER AND TYPE OF WSP EMPLOYEES

WSP type	Part-time	Full-time
Small	27	5
Medium	34	4
Large	99	5
Total Sample	160	14

5.2 OVERALL WATER SUPPLY SERVICES VALUE CHAIN LEVEL PMEP INDICATOR RESULTS

The baseline study results for all water enterprise-level performance indicators outlined in the Cambodia MSME PMEP are summarized in the table below.

¹¹ Income or “Calculated cash flow” calculations did not account for the depreciation of assets.

TABLE 59: BASELINE STUDY RESULTS FOR THE WATER SUPPLY SERVICES VALUE CHAIN

Indicator	Water Services Provider (WSP) by type	Baseline Values		
		TOTAL VALUE	MEAN VALUE	SAMPLE (n)
1 Percentage change in value of sales of project assisted enterprise (\$/%)	ALL WSPs	\$ 1,779,560		35
	Small WSP	\$177,606	\$13,662	13
	Medium WSP	\$349,764	\$29,147	12
	Large WSP	\$1,252,190	\$125,219	10
Cost of Business (\$/%)	ALL WSPs	\$507,500		23
	Small WSP	\$69,000	\$6,900	10
	Medium WSP	\$125,300	\$17,900	7
	Large WSP	\$313,200	\$52,200	6
2 Percentage change in income (Gross Profit= Value of Sales - Cost of Business \$/%)	ALL WSPs	\$670,700		23
	Small WSP	\$49,000	\$4,900	10
	Medium WSP	\$93,100	\$13,300	7
	Large WSP	\$528,600	\$88,100	6
3 Percentage change in Volume of production in project assisted enterprise (units/%) (in cubic meters per day)	ALL WSPs - Dry season	12,490		35
	Small WSP	1144	88	13
	Medium WSP	2616	218	12
	Large WSP	8730	873	10
	ALL WSPs - Wet season	8,641		35
	Small WSP	429	33	13
	Medium WSP	1452	121	12
	Large WSP	6760	676	10
4 Number of Full-time equivalent jobs created: (Full Time Job Equiv. = FT jobs * 100% + PT jobs * 50%)	ALL WSPs	167		35
	Small WSP	30	2.3	13
	Medium WSP	36	3.0	12
	Large WSP	102	10.2	10
5 Percentage change in investments (\$/%)	ALL WSPs	\$5,078,000		35
	Small WSP	\$962,000	\$74,000	13
	Medium WSP	\$1,476,000	\$123,000	12
	Large WSP	\$2,640,000	\$264,000	10

5. ANNEXES

ANNEX A: ESTIMATED TOTAL VALUES FOR PIG, FISH, AND BRICK AND TILE ENTERPRISES

Using the above survey findings on mean values of PMEP indicators by enterprise, this section provides estimates of the total values of PMEP indicators among all 2,336 Cambodia MSME-supported active enterprises as of July 3, 2009. This estimate is useful as an estimate of total dollar values for the broader Cambodia MSME client base, beyond the baseline sample, and which the project will impact.

This estimate draws on the updated TAMIS client list for all Active Component 1 Enterprise Clients as of July 3, 2009, and is calculated by multiplying the mean enterprise PMEP indicator values by value chain actor, multiplied by the total number of value chain actor enterprises shown in the updated TAMIS client list.

The estimated baseline total value of sales for all active Cambodia MSME clients is \$7.8 million, of which 68% comes from the pig value chain enterprises, with 52% from pig producers. The fish value chain enterprises account for 11%, and the brick and tile value chain represents 21% of total value of sales.

TABLE 60: ESTIMATED TOTAL CAMBODIA MSME CLIENT VALUE OF SALES

Value Chain/Actor	MEAN VALUE	TOTAL Cambodia MSME CLIENTS	TOTAL VALUE	% OF TOTAL VALUE
Value of Sales				
Pig producer	\$2,555	1610	\$4,113,550	52%
Pig trader	\$20,598	4	\$82,392	1%
Pig ISP-Vet./LVA	\$808	241	\$194,728	2%
Pig ISP-input supplier	\$16,054	57	\$915,078	12%
Sub-Total			\$5,305,748	68%
Fish producer	\$1,947	390	\$759,330	10%
Fish trader	\$22,024	6	\$132,144	2%
Sub-Total			\$891,474	11%
Brick & tile makers	\$59,073	28	\$1,654,044	21%
Sub-Total			\$1,654,044	21%
Total			\$7,851,266	100%

The estimated baseline total cost of business for all active Cambodia MSME clients is \$5.2 million, of which 74% represents pig value chain enterprises, with 55% from pig producers. Fish value chain enterprises account for 7%, and the brick and tile value chain represents 19% of the total cost of business. Proportional to value of sales, the cost of business for pig value chain enterprises is relatively high when compared other value chains.

TABLE 61: ESTIMATED TOTAL CAMBODIA MSME CLIENT COST OF BUSINESS

Value Chain/Actor	MEAN VALUE	TOTAL Cambodia MSME CLIENTS	TOTAL VALUE	% OF TOTAL VALUE
Cost of Business				
Pig producer	\$1,775	1610	\$2,857,750	55%
Pig trader	\$17,764	4	\$71,056	1%
Pig ISP-Vet./LVA	\$483	241	\$116,403	2%
Pig ISP-input supplier	\$14,817	57	\$844,569	16%
Sub-Total			\$3,889,778	74%
Fish producer	\$608	390	\$237,120	5%
Fish trader	\$19,621	6	\$117,726	2%
Sub-Total			\$354,846	7%
Brick & tile makers	\$35,220	28	\$986,160	19%
Sub-Total			\$986,160	19%
TOTAL			\$5,230,784	100%

The estimated baseline total income for all active Cambodia MSME clients is \$2.6 million, of which 54% represents pig value chain enterprises, with 48% from pig producers. Fish value chain enterprises account for 20%, and the brick and tile value chain represent 25% of income. Lower costs of business relative to value of sales in the fish, and brick and tile, value chains mean that these types of enterprise contribute a larger share of income among all enterprises.

TABLE 62: ESTIMATED TOTAL CAMBODIA MSME CLIENT INCOME

Value Chain/Actor	MEAN VALUE	TOTAL Cambodia MSME CLIENTS	TOTAL VALUE	% OF TOTAL VALUE
Income				
Pig producer	\$780	1610	\$1,255,800	48%
Pig trader	\$2,834	4	\$11,336	0%
Pig ISP-Vet./LVA	\$325	241	\$78,325	3%
Pig ISP-input supplier	\$1,236	57	\$70,452	3%
Sub-Total			\$1,415,913	54%
Fish producer	\$1,339	390	\$522,210	20%
Fish trader	\$2,403	6	\$14,418	1%
Sub-Total			\$536,628	20%
Brick & tile makers	\$23,854	28	\$667,912	25%
Sub-Total			\$667,912	25%
TOTAL			\$2,620,453	100%

The estimated baseline total investments for all active Cambodia MSME clients is \$17.9 million, of which 48% is from the pig value chain enterprises, with 42% from pig producers. The fish value chain enterprises account for 26%, and the brick and tile value chain represents 26% of income.

TABLE 63: ESTIMATED TOTAL CAMBODIA MSME CLIENT INVESTMENTS

Value Chain/Actor	MEAN VALUE	TOTAL Cambodia MSME CLIENTS	TOTAL VALUE	% OF TOTAL VALUE
Investments				
Pig producer	\$4,712	1610	\$7,586,320	42%
Pig trader	\$580	4	\$2,320	0%
Pig ISP-Vet./LVA	\$1,388	241	\$334,508	2%
Pig ISP-input supplier	\$10,596	57	\$603,972	3%
Sub-Total			\$8,527,120	48%
Fish producer	\$12,028	390	\$4,690,920	26%
Fish trader	\$902	6	\$5,412	0%
Sub-Total			\$4,696,332	26%
Brick & tile makers	\$168,009	28	\$4,704,252	26%
Sub-Total			\$4,704,252	26%
TOTAL			\$17,927,704	100%

The estimated baseline total full-time equivalent employment for all active Cambodia MSME clients is 5,834 persons employed, the vast majority of which is family labor, rather than hired labor. Most employment is in the pig value chain, with 69% in pig producer enterprises. Fish producer enterprises are also relatively important providing, 18% of total employment.

TABLE 64: ESTIMATED TOTAL CAMBODIA MSME CLIENT EMPLOYMENT

Value Chain/Actor	MEAN VALUE	TOTAL Cambodia MSME CLIENTS	TOTAL VALUE	% OF TOTAL VALUE
Employment				
Pig producer	2.5	1610	4025	69%
Pig trader	1.9	4	8	0%
Pig ISP-Vet./LVA	1.1	241	265	5%
Pig ISP-input supplier	2.4	57	137	2%
Sub-Total			4435	76%
Fish producer	2.7	390	1053	18%
Fish trader	2.6	6	16	0%
Sub-Total			1069	18%
Brick & tile makers	11.8	28	330	6%
Sub-Total			330	6%
TOTAL			5834	100%

ANNEX B: ADDITIONAL REPORT TABLES

TABLE A65: PIG PRODUCER INVESTMENTS

Item	Sample (n)	% Total	Units		Values (\$)	
			Mean	Median	Mean	Median
ASSETS						
Land for pig production (m2)	555	100%	272	50	\$ 2,902	\$ 239
Pig pen (no cement floor-no.)	26	5%	1.2	1.0	\$ 174	\$ 48
Pig pen (cement floor-no.)	529	95%	1.3	1.0	\$ 472	\$ 144
Troughs (no.)	541	97%	3.8	3.0	\$ 52	\$ 12
Feed making machine (no.)	29	5%	1.2	1.0	\$ 279	\$ 192
Cooking pan & cooker (no.)	387	70%	2.1	2.0	\$ 47	\$ 14
AI equipment (no.)	11	2%	3.3	2.0	\$ 15	\$ 10
Water pump (no.)	287	52%	1.1	1.0	\$ 166	\$ 120
Biogas	19	3%	1.0	1.0	\$ 510	\$ 383
Pig transport-motorcycle	447	81%	1.1	1.0	\$ 618	\$ 574
Pig transport-truck	13	2%	1.0	1.0	\$ 4,070	\$ 3,830
Other major assets	476	86%	No Unit	No Unit	\$ 34	\$ 10
BREEDING STOCK						
Breeding boars	47	8%	2.3	2.0	\$ 604	\$ 479
Breeding sows	395	71%	3.0	2.0	\$ 670	\$ 311
Total Sample/ Value	555	100%			\$ 4,712	\$ 1,514

TABLE A66: PIG PRODUCER VOLUME OF PRODUCTION OF PIGS FOR SALE

Item	Sample (n)	% Total	Units	
			Mean	Median
Boars	7	1%	1.6	1.0
Sows	51	9%	2.2	1.0
Fattening pigs	484	87%	19.6	12
Piglets	180	32%	23.6	14
Total Sample/ Value	555	100%	25	15

TABLE A67: PIG PRODUCER VALUE OF SALES

Item	Enterprises		Units Sold (head)		Total Value (\$)		Unit Value / Head (\$)	
	Number	% Total	Mean	Median	Mean	Median	Mean	Median
Boars	7	1%	1.6	1	\$ 275	\$ 144	\$ 175	\$ 144
Sows	51	9%	2.2	1	\$ 292	\$ 239	\$ 134	\$ 239
Fattening pigs	484	87%	19.6	12	\$ 2,596	\$ 1,436	\$ 133	\$ 120
Piglets	180	32%	23.6	14	\$ 802	\$ 402	\$ 34	\$ 29
Total Sample/ Value	555	100%	25	15	\$2,555	\$1,382	\$102	\$92

TABLE A68: PIG PRODUCER COSTS OF BUSINESS

Item	Sample (n)	% Total	Units		Total Values (\$)	
			Mean	Median	Mean	Median
BOUGHT STOCK						
Boars	7	1%	1.4	1	\$ 294	\$ 287
Sows	56	10%	2.1	1	\$ 173	\$ 169
Fattening pigs	81	15%	18.3	7	\$ 1,026	\$ 287
Piglets	279	50%	13.8	9	\$ 484	\$ 287
Sub-Total stock costs	555				\$ 414	\$ 120
GOODS & SERVICES INPUTS						
Feed: manufactured & cooking kg	527	95%	1347	590	\$ 809	\$ 377
Feed: homemade & cooking kg	532	96%	2376	1410	\$ 455	\$ 239
Veterinary service fees	119	21%	No Unit	No Unit	\$ 21	\$ 12
Vaccines: head	452	81%	27	17	\$ 47	\$ 17
Other medicine	422	76%	No Unit	No Unit	\$ 32	\$ 12
Water supply	37	7%	No Unit	No Unit	\$ 41	\$ 20
Machinery fuel, oil, maintenance	297	54%	No Unit	No Unit	\$ 53	\$ 24
Electricity/battery	278	50%	No Unit	No Unit	\$ 14	\$ 5
Hired labor, part-time	4	1%	No Unit	No Unit	\$ 63	\$ 62
Hired labor, full-time	19	3%	No Unit	No Unit	\$ 239	\$ 144
Other technical services	4	1%	No Unit	No Unit	\$ 18	\$ 8
Hired transport costs	111	20%	No Unit	No Unit	\$ 21	\$ 7
Own transport fuel, oil, maint.	460	83%	No Unit	No Unit	\$ 36	\$ 19
Licenses and fees	10	2%	No Unit	No Unit	\$ 35	\$ 23
Other major costs	220	40%	No Unit	No Unit	\$ 14	\$ 8
Total Sample/ Value	555	100%			\$ 1,775	\$ 1,020

TABLE A69: PIG ISP VETERINARIAN/VLA INVESTMENTS

VET./VLA SERVICES	Sample (n)	% Total	Units		Values (USD)	
			Mean	Median	Mean	Median
ASSET						
Land: shop/office m2	3	8%	41	40	\$ 861	\$ 957
Buildings: shop/office	3	8%	No Unit	No Unit	\$ 4,468	\$ 4,787
Buildings: storage	2	5%	No Unit	No Unit	\$ 6,750	\$ 6,750
Equipment: storage/refrigeration	14	38%	No Unit	No Unit	\$ 36	\$ 26
Equipment: veterinarian	35	95%	No Unit	No Unit	\$ 93	\$ 29
Equipment: feed Storage	1	3%	No Unit	No Unit	\$ 48	\$ 48
Equipment: pen/trough-building	1	3%	No Unit	No Unit	\$ 24	\$ 24
Transport: motorcycle	33	89%	1.0	1.0	\$ 536	\$ 479
Transport: truck/car	0	0%	0	0	\$ -	\$ -
Other major input/service assets	12	32%	No Unit	No Unit	\$ 28	\$ 10
Total Sample/ Value	37	100%			\$ 1,388	\$ 617

TABLE A70: PIG ISP INPUT SUPPLIER INVESTMENTS

INPUT SUPPLIERS	Sample (n)	% Total	Units		Values (USD)	
			Mean	Median	Mean	Median
ASSET						
Land: shop/office m2	21	88%	86.3	40	\$ 2,364	\$ 957
Buildings: shop/office	21	88%	No Unit	No Unit	\$ 4,862	\$ 1,436
Buildings: storage	9	38%	No Unit	No Unit	\$ 8,901	\$ 2,393
Equipment: storage/refrigeration	10	42%	No Unit	No Unit	\$ 204	\$ 66
Equipment: veterinarian	8	33%	No Unit	No Unit	\$ 195	\$ 69
Equipment: feed Storage	13	54%	No Unit	No Unit	\$ 101	\$ 72
Equipment: pen/trough-building	5	21%	No Unit	No Unit	\$ 411	\$ 96
Transport: motorcycle	12	50%	1.1	1.0	\$ 718	\$ 371
Transport: truck/car	3	13%	1.3	1.0	\$ 2,011	\$ 1,915
Other major input/service assets	8	33%	No Unit	No Unit	\$ 103	\$ 22
Total Sample/ Value	24	100%			\$ 10,596	\$ 4,073

TABLE A71: PIG INPUT & SERVICE PROVIDERS VALUE OF SALES

	Sample (n)	% Tot	Units		Total Value (\$)		Unit Value (\$)	
			Mean	Median	Mean	Median	Mean	Median
VETERINARIAN SERVICES								
Vaccination service fee (no.)	29	78%	177	36	\$ 71	\$ 29	\$ 0.40	\$ 0.80
Vaccines (no. of head)	35	95%	452	160	\$ 320	\$ 101	\$ 0.71	\$ 0.63
Treatment service fee(no.)	32	86%	402	107	\$ 277	\$ 97	\$ 0.69	\$ 0.91
Treatment medicines(no. head)	31	84%	225	100	\$ 248	\$ 108	\$ 1.10	\$ 1.08
A.I service fee(no.)	3	8%	3.3	3.0	\$ 22	\$ 10	\$ 6.46	\$ 3.19
A.I semen (no. of head)	2	5%	3.5	3.5	\$ 11	\$ 11	\$ 3.08	\$ 3.08
Total	37		1242	454	\$ 808	\$ 350	\$ 0.65	\$ 0.77
INPUT SUPPLIER SERVS								
Feed sales	24	100%	19848	8000	\$13,474	\$ 4,524	\$ 0.68	\$ 0.57
Vaccination sales	11	46%	470	100	\$ 717	\$ 215	\$ 1.52	\$ 2.15
Medicine sales	13	54%	1756	300	\$ 3,464	\$ 574	\$ 1.97	\$ 1.91
Pig production equipment sales	6	25%	No Unit	No Unit	\$ 258	\$ 138	No Unit	No Unit
Pig processing equipment sales	0	0%	No Unit	No Unit	\$ -	\$ -	No Unit	No Unit
Veterinarian equipment sales	10	42%	No Unit	No Unit	\$ 741	\$ 26	No Unit	No Unit
OTHER SERVICES								
Pig pen construction	0	0%	0.0	0.0	\$ -	\$ -	\$ -	\$ -
Pig trough construction/sales	1	4%	1.0	1.0	\$ 8	\$ 8	\$ 8.38	\$ 8.38
Pig transport services	0	0%	0.0	0.0	\$ -	\$ -	\$ -	\$ -

	Sample (n)	% Tot	Units		Total Value (\$)		Unit Value (\$)	
			Mean	Median	Mean	Median	Mean	Median
Other pig tech. advisory services	0	0%	0.0	0.0	\$ -	\$ -	\$ -	\$ -
Other major input/service sales	2	8%	0.0	0.0	\$ 10	\$ 10	\$ -	\$ -
Total Sample/ Value	24	100%		8172	\$16,054	\$ 7,986	\$ 0.76	\$ 0.98

TABLE A72: PIG INPUT & SERVICE PROVIDER COSTS OF BUSINESS

COST OF BUSINESS	Sample (n)	% Total	Values (\$)	
			Mean	Median
VETERINARIAN SERVICES				
Vaccines stock	35	95%	\$ 221	\$ 71
Other medicines stock	30	81%	\$ 189	\$ 132
Veterinary consumables stock	29	78%	\$ 18	\$ 14
Machinery fuel, oil, maintenance	5	14%	\$ 100	\$ 96
Electricity/battery	15	41%	\$ 11	\$ 4
Hired labor, part-time	1	3%	\$ 5	\$ 5
Hired labor, full-time	0	0%	\$ -	\$ -
Own transport fuel, oil, maint.	31	84%	\$ 101	\$ 50
Hired transport costs	1	3%	\$ 48	\$ 48
Licenses and fees	1	3%	\$ 36	\$ 36
Other major costs	6	16%	\$ 7	\$ 6
Total Sample/ Value	37	100%	\$ 483	\$ 238
INPUT SUPPLIER SERVICES				
Feed	24	100%	\$ 12,200	\$ 4,260
Vaccinations	11	46%	\$ 622	\$ 191
Medicines	13	54%	\$ 3,143	\$ 503
Pig production equipment stock	4	17%	\$ 254	\$ 144
Pig processing equipment stock	0	0%	\$ -	\$ -
Veterinarian equipment stock	9	38%	\$ 441	\$ 144
Machinery fuel, oil, maintenance	1	4%	\$ 5	\$ 5
Electricity/battery	11	46%	\$ 36	\$ 15
Hired labor part-time	1	4%	\$ 345	\$ 345
Hired labor full-time	3	13%	\$ 239	\$ 287
Own transport fuel, oil, maint.	14	58%	\$ 97	\$ 54
Hired transport costs	12	50%	\$ 524	\$ 109
Licenses and fees	11	46%	\$ 69	\$ 18
Other major costs	5	21%	\$ 22	\$ 14
OTHER SERVICES				
Pig pen materials	0	0%	\$ -	\$ -
Pig trough materials	1	4%	\$ 7	\$ 7
Transport fuel, oil, maintenance	2	8%	\$ 20	\$ 20
Machinery fuel, oil, maintenance	1	4%	\$ 20	\$ 20
Electricity/battery	2	8%	\$ 4	\$ 4
Hired labor part-time	0	0%	\$ -	\$ -
Hired labor full-time	0	0%	\$ -	\$ -

COST OF BUSINESS			Values (\$)	
Item	Sample (n)	% Total	Mean	Median
Own transport fuel, oil, maint.	3	13%	\$ 10	\$ 2
Hired transport costs	0	0%	\$ -	\$ -
Licenses and fees	0	0%	\$ -	\$ -
Other major costs	2	8%	\$ 31	\$ 31
Total Sample/ Value	24	100%	\$ 14,817	\$ 6,662

TABLE A73: FISH PRODUCER INVESTMENTS

Item	Sample (n)	% Total	Units		Values (\$)	
			Mean	Median	Mean	Median
ASSETS						
Land for fish production m2	146	100%	1530	800	\$ 8,763	\$ 1,976
Hatcheries excavation m3	4	3%	11	11	\$ 101	\$ 101
Hatcheries tank no.	6	4%	5	3	\$ 517	\$ 347
Fish pond excavation m3	146	100%	2797	1298	\$ 2,285	\$ 1,000
Fish pond area m2	146	100%	1020	507	\$ 5,028	\$ 1,209
Fish/ water supply tank no.	13	9%	299	225	\$ 2,835	\$ 1,675
Feed making machine no.	7	5%	1	1	\$ 322	\$ 383
Feeding pan no.	98	67%	1	1	\$ 15	\$ 7
Stove no.	82	56%	1	1	\$ 12	\$ 4
Water pump no.	84	58%	1	1	\$ 204	\$ 144
Hatcheries equipment	5	3%	No Unit	No Unit	\$ 472	\$ 72
Fish raising equipment	94	64%	No Unit	No Unit	\$ 52	\$ 19
Motorcycle no.	92	63%	1	1	\$ 585	\$ 479
Truck no.	2	1%	1	1	\$ 1,101	\$ 1,101
Other major assets	121	83%	No Unit	No Unit	\$ 99	\$ 12
BROOD STOCK						
Tilapia head	38	26%	134	39	\$ 91	\$ 24
Carp head	14	10%	114	50	\$ 110	\$ 19
Pangasius head	4	3%	575	350	\$ 206	\$ 215
Total Sample/ Value	146	100%			\$ 12,028	\$ 3,980

TABLE A74: FISH PRODUCER VOLUME OF FISH PRODUCTION FOR SALE

Item	Sample (n)	% Total	Units	
			Mean	Median
Mature fish-Tilapia	82	56%	1989	405
Mature fish-Carp	72	49%	538	300
Mature fish-Pangasius	67	46%	2055	900
Stunted fish-Tilapia	17	12%	228	50
Stunted fish-Carp	13	9%	127	50
Stunted fish-Pangasius	11	8%	3357	150
Fingerling-Tilapia	16	11%	10067	5500
Fingerling-Carp	6	4%	13107	2125

Item	Sample (n)	% Total	Units	
			Mean	Median
Fingerling-Pangasius	2	1%	2600	2600
Total Sample/ Value	146	100%	4294	800

TABLE A75: FISH PRODUCERS TOTAL VOLUME OF PRODUCTION

Item	Sample (n)	% Total	Units	
			Mean	Median
Mature fish-Tilapia	11	8%	781	400
Mature fish-Carp	7	5%	470	100
Mature fish-Pangasius	3	2%	347	500
Stunted fish-Tilapia	11	8%	804	300
Stunted fish-Carp	2	1%	115	115
Stunted fish-Pangasius	3	2%	483	100
Fingerling-Tilapia	95	65%	7036	1000
Fingerling-Carp	81	55%	2102	600
Fingerling-Pangasius	77	53%	4137	2000
Total Sample/ Value	146	100%	8087	2100

TABLE A76: FISH PRODUCERS VALUE OF SALES

Item	Sample (n)	% Total	Units		Values (\$)		Unit Value (\$)	
			Mean	Median	Mean	Median	Mean	Median
Mature fish-Tilapia	82	56%	1,989	405	\$ 1,241	\$ 348	\$ 0.62	\$ 0.86
Mature fish-Carp	72	49%	538	300	\$ 559	\$ 243	\$ 1.04	\$ 0.81
Mature fish-Pangasius	67	46%	2,055	900	\$ 1,710	\$ 503	\$ 0.83	\$ 0.56
Stunted fish-Tilapia	17	12%	228	50	\$ 44	\$ 10	\$ 0.19	\$ 0.19
Stunted fish-Carp	13	9%	127	50	\$ 27	\$ 12	\$ 0.21	\$ 0.24
Stunted fish-Pangasius	11	8%	3,357	150	\$ 712	\$ 36	\$ 0.21	\$ 0.24
Fingerling-Tilapia	16	11%	10,067	5,500	\$ 927	\$ 414	\$ 0.09	\$ 0.08
Fingerling-Carp	6	4%	13,107	2,125	\$ 599	\$ 112	\$ 0.05	\$ 0.05
Fingerling-Pangasius	2	1%	2,600	2,600	\$ 182	\$ 182	\$ 0.07	\$ 0.07
Total Sample/ Value	146	100%	4,294	800	\$ 1,947	\$ 657	\$ 0.45	\$ 0.82

TABLE A77: FISH PRODUCER COST OF BUSINESS

Item	Sample (n)	% Total	Units		Values (\$)		Unit Value (\$)	
			Mean	Median	Mean	Median	Mean	Median
BOUGHT STOCK								
Stunted fish-Tilapia	6	4%	867	250	\$ 49	\$ 21	\$ 0.06	\$ 0.08
Stunted fish-Carp	2	1%	115	115	\$ 2	\$ 2	\$ 0.02	\$ 0.02
Stunted fish-Pangasius	3	2%	483	100	\$ 12	\$ 2	\$ 0.02	\$ 0.02
Fingerling-Tilapia	72	49%	1480	475	\$ 40	\$ 10	\$ 0.03	\$ 0.02
Fingerling-Carp	79	54%	1991	500	\$ 35	\$ 12	\$ 0.02	\$ 0.02
Fingerling-Pangasius	76	52%	5298	1500	\$ 169	\$ 48	\$ 0.03	\$ 0.03
GOODS & SERVICES								
Feed-manufactured/pellets	79	54%	434	125	\$ 242	\$ 65	\$ 0.56	\$ 0.52
Feed-home made & prep.								
Rice bran	130	89%	1169	420	\$ 152	\$ 49	\$ 0.13	\$ 0.12
Trash fish	24	17%	1289	300	\$ 215	\$ 60	\$ 0.17	\$ 0.20
Soy bean	6	4%	1081	360	\$ 202	\$ 48	\$ 0.19	\$ 0.13
broken rice	95	65%	277	140	\$ 65	\$ 32	\$ 0.23	\$ 0.23
Medicine-bottle	17	12%	11	6	\$ 20	\$ 18	\$ 1.86	\$ 2.99
Medicine-tablet	14	10%	1011	175	\$ 77	\$ 22	\$ 0.08	\$ 0.12
Hormone-bottle	3	2%	3	2	\$ 81	\$ 48	\$ 26.99	\$ 23.93
Hormone-tablet	2	1%	50	50	\$ 46	\$ 46	\$ 0.93	\$ 0.93
Lime	96	66%	60	15	\$ 14	\$ 3	\$ 0.24	\$ 0.19
Water supply	11	8%	No Unit	No Unit	\$ 17	\$ 14	No Unit	No Unit
Machinery fuel, oil, maint.	88	60%	No Unit	No Unit	\$ 43	\$ 19	No Unit	No Unit
Electricity/battery	76	52%	No Unit	No Unit	\$ 20	\$ 12	No Unit	No Unit
Hired labor Part-Time	2	1%	No Unit	No Unit	\$ 84	\$ 84	No Unit	No Unit
Hired labor Full-Time	5	3%	No Unit	No Unit	\$ 412	\$ 287	No Unit	No Unit
Other technical Services	3	2%	No Unit	No Unit	\$ 12	\$ 7	No Unit	No Unit
Own t'sport fuel, oil, maint.	102	70%	No Unit	No Unit	\$ 45	\$ 14	No Unit	No Unit
Hired transport costs	39	27%	No Unit	No Unit	\$ 20	\$ 7	No Unit	No Unit
Licenses and Fees	7	5%	No Unit	No Unit	\$ 60	\$ 24	No Unit	No Unit
OTHER/ANY								
Other major costs	115	79%	No Unit	No Unit	\$ 17	\$ 7	No Unit	No Unit
Total Sample/ Value	146	100%			\$ 608	\$ 266		

TABLE A78: BRICK & TILE MAKER INVESTMENTS

Item	Sample (n)	% Total	Units		Values (\$)	
			Mean	Median	Mean	Median
ASSETS						
Land	15	100%	25101	21000	\$ 112,116	\$ 140,737
Buildings/storage/structures	15	100%	No Unit	No Unit	\$ 18,909	\$ 19,148

Item	Sample (n)	% Total	Units		Values (\$)	
			Mean	Median	Mean	Median
Existing kilns (not renovated)	9	60%	No Unit	No Unit	\$ 10,643	\$ 7,659
Existing kilns (renovated last year)	9	60%	No Unit	No Unit	\$ 15,345	\$ 8,617
New kilns (constructed last year)	4	27%	No Unit	No Unit	\$ 11,417	\$ 9,574
Water pump	15	100%	No Unit	No Unit	\$ 310	\$ 239
Equipment-clay mix preparation	12	80%	No Unit	No Unit	\$ 4,057	\$ 4,428
Equipment-kiln	3	20%	No Unit	No Unit	\$ 2,249	\$ 34
Equipment-drying	3	20%	No Unit	No Unit	\$ 5,744	\$ 6,893
Equipment-glazing	0	0%	No Unit	No Unit	.	.
Equipment-B&T handling	12	80%	No Unit	No Unit	\$ 1,127	\$ 1,005
B&T transport-motorcycle	4	27%	1.3	1.0	\$ 910	\$ 862
B&T transport-truck	9	60%	1.8	2.0	\$ 16,754	\$ 7,659
Other major processing assets	14	93%	No Unit	No Unit	\$ 2,138	\$ 706
Total Sample/ Value	15	100%			\$ 168,009	\$ 158,844

TABLE A79: BRICK & TILE MAKERS VOLUME OF PRODUCTION FOR SALE

Item	Sample (n)	% Total	Units	
			Mean	Median
BRICKS (N=15)				
Bricks-Quality 1	15	100%	1,039,467	720,000
Bricks Quality 2	2	13%	370,000	370,000
Total Brick	15	100%	1,088,800	840,000
TILES (N=9)				
Roof tiles-Quality 1	9	100%	584,444	400,000
Roof tiles Quality 2	2	22%	350,000	350,000
Floor/wall tiles-Quality 1	0	0%	0	0
Floor/wall tiles-Quality 2	0	0%	0	0
Total Sample/ Value Tile	9	100%	662,222	477,778
Total Sample/ Value Brick and Tile	15	100%	1,486,133	1,380,000

TABLE A80: BRICK & TILE MAKERS VALUE OF SALES

Item	Sample (n)	% Total	Units		Values (\$)		Unit Value (\$'000)	
			Mean	Median	Mean	Median	Mean	Median
BRICKS (N=15)								
Bricks-Quality 1	15	100%	1,039,467	720,000	\$ 35,448	\$ 18,095	\$ 34.10	\$ 25.13
Bricks Quality 2	2	13%	370,000	370,000	\$ 12,446	\$ 12,446	\$ 33.64	\$ 33.64
Total Brick	15	100%	1,088,800	840,000	\$ 37,108	\$ 25,850	\$ 34.08	\$ 30.77
TILES (N=9)								
Roof tiles-Quality 1	9	100%	584,444	400,000	\$ 32,222	\$ 22,020	\$ 55.13	\$ 55.05
Roof tiles Quality 2	2	22%	350,000	350,000	\$ 19,746	\$ 19,746	\$ 56.42	\$ 56.42
Floor/wall tiles-Quality 1	0	0%	0.0	0.0	\$ -	\$ -	\$ -	\$ -
Floor/wall tiles-Quality 2	0	0%	0.0	0.0	\$ -	\$ -	\$ -	\$ -
Total Sample/ Value Tile	9	100%	662,222	477,778	\$ 36,610	\$ 26,408	\$ 55.28	\$ 55.27
Total Sample/ Value Brick and Tile	15	100%	1,486,133	1,380,000	\$ 59,073	\$ 36,620	\$ 39.75	\$ 26.54

TABLE A81: BRICK & TILE MAKERS COST OF BUSINESS-BRICK MAKING

Item	Sample (n)	% Total	Units		Values (\$)		Unit Value (\$)	
			Mean	Median	Mean	Median	Mean	Median
BRICK MAKING COSTS (N=15)								
Clay	15	100%	3,178	1,800	\$ 5,385	\$ 2,908	\$ 1.69	\$ 1.62
Sand	2	100%	115	115	\$ 424	\$ 424	\$ 3.68	\$ 3.68
Lime	0	0%	0	0	.	.	.	.
Chemicals/dyes	0	0%	No Unit	No Unit	.	.	.	.
Glazing	0	0%	No Unit	No Unit	.	.	.	.
Water	10	67%	1,238	1,480	\$ 10	\$ 10	\$ 0.01	\$ 0.01
Fuel wood	15	100%	1,159	720	\$ 8,034	\$ 5,744	\$ 6.93	\$ 7.98
Charcoal	0	0%	0	0	.	.	.	.
Hired labor part-time	15	100%	No Unit	No Unit	\$ 7,981	\$ 4,787	.	.
Hired labor full-time	3	20%	No Unit	No Unit	\$ 1,219	\$ 1,149	.	.
Machinery fuel, oil, maint.	15	100%	No Unit	No Unit	\$ 1,901	\$ 771	.	.
Electricity	5	33%	No Unit	No Unit	\$ 311	\$ 345	.	.
Own T'spt fuel, oil, maint.	12	80%	No Unit	No Unit	\$ 1,425	\$ 629	.	.
Hired transport costs	7	47%	No Unit	No Unit	\$ 2,399	\$ 1,436	.	.
Licenses and fees	11	73%	No Unit	No Unit	\$ 343	\$ 191	.	.
Other major costs	13	87%	No Unit	No Unit	\$ 437	\$ 191	.	.
Total Sample/ Value Brick	15	100%			\$ 26,596	\$ 17,011		

TABLE A82: BRICK & TILE MAKERS COST OF BUSINESS-TILE MAKING & TOTAL

Item	Sample (n)	% Total	Units		Values (\$)		Unit Value (\$)	
			Mean	Median	Mean	Median	Mean	Median
TILE MAKING COSTS (N=9)								
Clay	9	100%	3,436	1,000	\$ 5,664	\$ 1,436	\$ 1.65	\$ 1.44
Sand	0	0%	0	0	\$ -	\$ -	\$ -	\$ -
Lime	0	0%	0	0	\$ -	\$ -	\$ -	\$ -
Chemicals/dyes	0	0%	No Unit	No Unit	\$ -	\$ -	No Unit	No Unit
Glazing	0	0%	No Unit	No Unit	\$ -	\$ -	No Unit	No Unit
Water	4	44%	387	90	\$ 6	\$ 6	\$ 0.01	\$ 0.06
Fuel wood	9	100%	798	600	\$ 6,546	\$ 5,744	\$ 8.20	\$ 9.57
Charcoal	0	0%	0	0	\$ -	\$ -	\$ -	\$ -
Hired labor: part-time	9	100%	No Unit	No Unit	\$ 4,889	\$ 6,702	No Unit	No Unit
Hired labor: full-time	1	11%	No Unit	No Unit	\$ 3,830	\$ 3,830	No Unit	No Unit
Machinery fuel, oil, maint.	9	100%	No Unit	No Unit	\$ 598	\$ 268	No Unit	No Unit
Electricity	3	33%	No Unit	No Unit	\$ 321	\$ 383	No Unit	No Unit
Own transport fuel, oil, maint.	7	78%	No Unit	No Unit	\$ 541	\$ 596	No Unit	No Unit
Hired transport costs	4	44%	No Unit	No Unit	\$ 1,029	\$ 112	No Unit	No Unit
Licenses and fees	4	44%	No Unit	No Unit	\$ 51	\$ 42	No Unit	No Unit
Other major costs	5	56%	No Unit	No Unit	\$ 236	\$ 29	No Unit	No Unit
Total Sample/ Value tile maker	9	100%			\$ 14,373	\$ 10,931		
Total Sample/ Value Brick & Tile Maker	15	100%			\$ 35,220	\$ 22,240		