

## Status of Bricks and Tiles Manufactured in Vigan, Ilocos Sur

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### Abstract

*The study was conducted to present the profile of the bricks and tiles industry in Wigan, Ilocos Sur, particularly the manufacturers' demographic, socio-cultural, and economic profile, their sources of financial assistance for the industry, their current production and marketing practices, and problems they encountered in the brick and tile industry.*

*An interview schedule was used to gather data from 151 bricks and tiles manufacturers in Wigan, Ilocos Sur. Frequency counts, percentages, and means were used to treat the data gathered.*

*The average bricks and tiles manufacturer was 46 years old, male, married and had young dependents, who were his own children.*

*The respondents' and their spouses' educational attainment ranged from elementary to high school graduate. Their fathers' educational attainment was slightly lower than their mothers'. Most of the respondents' children were in Grades I-V. Majority of the respondents owned a house and lot.*

*The average respondent was a single proprietor engaged in the bricks and tiles industry for 14 years. Majority of the respondents bought the clay they used at a price ranging from P101-700 per load.*

*Majority of them had a starting capital ranging from P1,500-3,999 which came from their own income. Only a few borrowed from the cooperatives, banks, relatives and friends.*

*More than half of them claimed that their working capital in the industry was sufficient. They had less than five laborers, majority of whom were 20-39 years old. The average bricks and tiles manufacturer had an average monthly income of P5,347.18.*

*Majority of the respondents produced square, unglazed tiles of different sizes. These were manually molded and open-fired. The materials used in firing were firewood, hay, and animal dung, which the manufacturers bought. More than half of the bricks manufacturers produced 50-149 pieces daily while majority of the tile manufacturers produced 77-216 tiles daily.*

*The average bricks manufacturer had an average monthly sales of P1,082.83 while the average tiles manufacturer had an average monthly sale of P1,296.35. They sold their products primarily to middlemen in the manufacturers' houses.*

*Most of the producers encountered problems on inadequate capital, high price of clay, irregular laborers, limited working place, and low price of sold products*

## Introduction

Ciudad Fernandina, now Vigan, Ilocos Sur, is one of the oldest town in the Philippines. Tourists come and go because of the unique antique houses built during the Spanish period. One of the primary materials used in constructing these structures are bricks and tiles arranged according to the taste of the architect who designed them to last for more than 400 years. These earthen materials used for building construction were manufactured mostly by ancestors who lived in this historical village.

Today (1999) some of the barangays at the western part of Vigan are manufacturing bricks, tiles, and other earthen products. With the elegance of today's technology, architects adopt these Vigan products as construction materials to add beauty and elegance to the structures they construct

Bricks and tiles manufactured in Vigan are versatile because of the variety of shapes and designs. With the new trend of architectural designs, these are used to beautify and improve the aesthetic touch of the constructed structure. The pieces of bricks and tiles may be arranged to create the desired figure or design. They may use either sealer or unglazed tiles or bricks depending on the consumer's desire.

Bricks and tiles are among man's oldest building materials due to their unique and functional properties. Bricks and tiles manufactured in Vigan are significantly linked to Ilocano heritage so that unacceptance of these products would face out a part of Filipino culture. A study on the status of the manufacture of bricks and tiles in Vigan, Ilocos Sur is necessary to determine whether or not it has good business prospects and would remain to give significant contribution to the upliftment of Ilocano culture

## Objectives of the Study

This study was conducted to present the profile of the bricks and tiles industry in Vigan, Ilocos Sur.

Specifically, it aimed to:

1. Present the demographic, socio-cultural, and economic profile of the bricks and tiles manufacturers.

2. Find out the manufacturers' sources of income other than the bricks and tiles
3. Find out the manufacturers' financial assistance extended to the manufacturers to beef up the industry.
4. Assess the current production and marketing practices of the bricks and tiles manufacturers.
5. Find out the problems encountered by the bricks and tiles manufacturers.

### **Review of Related Literature**

Bricks and tiles are produced from clay, the most ample raw materials used in building construction. Clay is obtained in three forms: surface clays, found near the surface of the earth; shales, also found near the surface but pressure-hardened almost to slate; and fire clays, found at greater depths. The clay is crushed, ground, screened, mixed with water in a pug mill to a plastic consistency, and molded into shape. The molded wet clay units are dried in ovens and then burned (fired) in kilns. If the brick is to be glazed, the glazes are sprayed on the brick before burning.

The size of a standard brick is often 3 3/4" x 2 1/4" x 8", but brick size varies widely among the different localities and manufacturers. Bricks may be manufactured with cores to reduce their weight. As long as the cored area does not exceed 25 percent of the gross area, these masonry units would be considered solid.

Brick is specified for exterior finish due to its color, texture, and inherent durability, thus, there is no reason to paint it.

On the other hand, structural clay tile is made from the same raw material and by the same processes as brick, but the units are hollow, lighter, and can be made larger. Consequently, tile walls can be erected more quickly than brick walls. Structural clay tile offers excellent stability and good insulation from heat, sound, and moisture.

Clay products of all kinds can be used for interior finishing. For exterior finishing material, the wall can be made of face brick over a back-up wall of common brick, clay tile or concrete block. Structural tiles and facing tiles are used in various ways in constructing curtain walls. Structural tiles are used as backup wall for face brick, facing tile, stone ceramic veneer or architectural terra cotta. For eight-inch through-wall, glazed or textured structural tile can be used alone (Salvan, 1986).

Gilliatt (1977) supports the contention that bricks and tiles are used for floor coverings in kitchens, halls, and passageways. Likewise Kraft (1971) states that tile is used to cover one wall, knotty elm paneling the others.

Flagstone, redwood, concrete, and brick are among the best materials used for patio decks. Brick-surface patio decks are very popular because bricks can be placed in a variety of arrangements to adapt to practically any shape or space. The use of heavy brick or

concrete construction delays the entry of daytime heat into the house and also has good thermal storage capabilities. (Hepler and Wallach, 1987).

In medieval *Europe*, in Persia, the use of tile and mosaic faience became a refined architectural feature. Tile and mosaic faience seem to keep their original color and brilliance eternally. The tradition of fired, glazed bricks continued from the cultures of the ancient Middle East, but with improved techniques, the Persians achieved a thin, tough tile that gave greater architectural flexibility. They learned that different colors reach their optimal luster at different firing temperatures. (Kurtich and Eakin, 1993).

## Methodology

This study was conducted among 151 bricks and tiles manufacturers of the following barangays in Vigan, Ilocos Sur from April to May 1999.

The descriptive method of research was used. An interview schedule was the primary tool in gathering the necessary data from the bricks and tiles manufacturers coupled with personal interviews with the laborers to complement or justify the responses of the manufacturers.

Frequency counts, percentages, and means were used to treat the gathered data.

## Findings and Discussion

### Profile of Manufacturers

The bricks and tiles manufacturers of Vigan, Ilocos Sur are described according to their demographic, socio-cultural, and economic profiles.

#### A. Demographic Profile

The demographic characteristics of the manufacturers included in the study were age, sex, marital status, and their dependents (Table I).

**Age.** A greater number of respondents were between 35-64 years old, 27.81% of whom were 35-44 years old; 26.49%, 45-54 years old; and 21.85%, 55-64 years old. Only 15.89% were 25-34 years of age; 5.96% were senior citizens (65 years old and above), and 1.99% were young adults (below 25 years old). The average bricks and tiles manufacturer was 46 years old. This indicates that most of them were mature and energetic enough to handle the tedious tasks of bricks and tiles production.

**Sex.** More than half (58.28%) of the manufacturers were male, while 41.72% were female. It was interesting to note that women also played an important role in the manufacture of bricks and tiles, which is considered a man's job. During the interview

with the female manufacturers, they alleged that their husbands entrusted them with the management of the business since women are more meticulous in handling monetary matters.

**Table I. Demographic profile of bricks and tiles manufacturers of Vigan, Ilocos Sur, 1999.**

CHARACTERISTIC	NO.	%
Age (years)		
65 & above	9	5.96
55--64	33	21.85
45--54	40	26.49
35--44	42	27.81
25--34	24	15.89
Below 25	3	1.99
Average Age: 46		
Sex		
Male	88	58.28
Female	63	41.72
Marital Status		
Single	12	7.95
Married	126	83.44
Widowed	13	8.61
<b>Kind of Dependents</b>		
Young (0-14 years old)	149	98.68
Old (65 years & above)	41	27.15
<b>Relationship of dependents to respondent</b>		
Children	139	92.05
Grandchildren	7	4.64
Niece	3	1.99
Parents	16	10.60
Grandparents	10	6.62
Sister	6	3.97
In-laws	5	3.31
Brother	4	2.65

**Marital status.** The majority (83.44%) of the manufacturers were married; 8.61% were widowed; and 7.95% were single.

**Dependents.** All the respondents had family members who depended on them for support and subsistence. Almost all of them (98.68%) had young dependents, 0-14 years old, while 27.15% had old dependents, 65 years or older. Their young dependents were their children, as mentioned by 92.05% of the respondents, grandchildren (4.64%), and nieces (1.99%). On the other hand, their old dependents were their parents, mentioned by 10.6%, grandparents (6.62%), sister (3.97%), in laws (3.31%), and brother (2.65%). These data imply that Ilocanos are benevolent and caring because they don't take care only of

their children but also their grandchildren, nieces, parents, grandparents, older brother/sister, and even their in-laws.

**B. Socio-Cultural Profile**

Table 2 presents the socio-cultural profile of the bricks and tiles manufacturers in terms of educational attainment of respondents, their spouse, father, mother, and children and the nature of ownership of the house they were living in.

**Respondents' educational attainment.** This ranged from elementary to high school graduate, although there were slightly more high school graduates (30.46%) than elementary graduates (26.49%). Less than one-fourth (17.22%) of the respondents studied from year I-III high school. Some respondents graduated from vocational/technical courses (3.97%) or from a college course (2.65%). Other respondents finished some grade levels in the elementary (9.93%), some year levels in college (4.64%), while 4.64% had no schooling at all.

**Table 2. Socio-cultural profile of bricks and tiles manufacturers in Vigan, Ilocos Sur, 1999.**

CHARACTERISTIC	NO.	%
<b>Educational attainment of respondents</b>	N=151	
No schooling	7	4.64
Below elementary graduate	15	9.93
Elementary graduate	40	26.49
Below high school graduate	26	17.22
High school graduate	46	30.46
Vocational/technical course graduate	6	3.97
Below college graduate	7	4.64
College graduate	4	2.65
<b>Educational attainment of spouse</b>	N=126	
No schooling	5	3.97
Below elementary graduate	9	7.14
Elementary graduate	30	23.81
Below high school graduate	24	19.05
High school graduate	36	28.57
Vocational/technical course graduate	10	7.94
Below college graduate	10	7.94
College graduate	2	1.58
<b>Educational attainment of father</b>	N=16	
Below elementary graduate	8	50.00
Elementary graduate	4	25.00
High school graduate	2	12.50
Vocational/technical course graduate	2	12.50

Table 2. Continued.

CHARACTERISTIC	NO.	%
<b>Educational attainment of mother</b>	N=16	
Below elementary graduate	4	25.00
Elementary graduate	5	31.25
Below high school graduate	2	12.50
High school graduate	5	31.25
<b>Level of education of children</b>	N=139	
Pre-schooler	15	10.79
Below elementary graduate	71	51.08
Elementary graduate	42	30.22
Below high school graduate	51	36.69
High school graduate	51	36.69
Vocational/technical course graduate	9	6.47
Below college graduate	33	23.74
College graduate	37	26.62
Taking masteral studies	13	9.35
Finished master's degree	2	1.44
<b>Nature of house ownership</b>		
Owned house and lot	126	83.44
Shared with parents	19	12.58
Shared with relatives	3	1.99
Caretaker	3	1.99

**Spouses' educational attainment.** Only 126 married respondents answered this item. Similar to the respondents, the spouses' educational attainment ranged from elementary to high school graduate. Again, there were slightly more high school graduates (28.57%) than elementary graduates (23.81%) and 19.05% of the respondents said that their spouses finished below fourth year high school. A few finished some years in college (7.94%), in elementary (7.14%), or graduates from vocational/technical courses (7.94%) or from college courses (1.58%). Only 3.97% did not go to school.

**Parents' educational attainment.** Only 16 manufacturers, answered this question. Of this number, 50% said their fathers did not graduate from elementary; 25% said their fathers graduated from elementary, and 12.5% each said their fathers graduated from high school or from a vocational/technical course.

On the other hand, 31.25% each of the respondents said their mothers were either elementary or high school graduates; 25% mentioned that their mothers did not finish elementary; and 12.5% said their mothers did not graduate from high school.

**Children's level of education.** A total of 139 married and widowed respondents gave multiple answers to this item. More than half (51.08%) of these respondents said that their children were studying in Grades 1-V. An equal number of respondents (36.69% each) said that their children either graduated from high school or did not finish high school. Almost one-third (30.22%) had children who graduated from elementary, while others had

children who were college graduates (26.62%), below college graduate (23.74%), or graduates of vocational/technical course (6.47%). The older respondents also had children taking masteral studies (9.35%) or finished a master's degree (1.44%). The younger respondents (10.79%) had children who were pre-schoolers.

**Nature of house ownership.** Majority (83.44%) of the respondents owned a house and lot while 12.58% shared it with their parents. Only a few (1.99% each) shared it with their relatives or was the caretaker of the house.

**C. Economic Profile**

The economic profile of the bricks and tiles manufacturers concerned the management of their business and their average monthly income (Table 3).

**Table 3. Economic profile of bricks and tiles manufacturers in Vigan, Ilocos Sur.**

CHARACTERISTIC	NO.	%
<b>Number of years engaged in the business</b>		
20 & above	22	14.57
15--19	60	39.73
10--14	38	25.17
5--9	19	12.58
1--4	12	7.95
<b>Average duration in the business - 14.32 years</b>		
<b>Nature of management of business</b>		
Single proprietor	137	90.73
Partnership	8	5.30
	6	3.97
<b>Source of clay for production</b>		
Clay is bought	90	59.60
Lot is rented/leased	15	30.46
Lot is owned by family	46	9.93
<b>Rent/lease of lot per month (pesos)</b>	N=46	
90	1	2.17
100	3	6.52
200	14	30.43
210	4	8.70
220	4	8.70
230	18	39.13
240	1	2.17
250	1	2.17



**Table 3. Continued.**

<b>CHARACTERISTIC</b>	<b>NO.</b>	<b>%</b>
<b>Price of clay per load (pesos)</b>	N=90	
100 & below	16	17.78
101--300	30	33.33
301--500	15	16.67
501--700	14	15.55
701-900	10	11.11
Above P900	5	5.56
<b>Starting capital in the business</b>		
P3,500 & above	7	4.64
2,500--3,499	59	39.07
1,500--2,499	49	32.45
500--1,499	27	17.88
Below P500	9	5.96
<b>Av</b> <b>starting capital</b> - P2,199.85		
<b>Source of Capital</b>		
Own capital	130	86.09
Credit/loan from:		
cooperatives	2	1.32
banks	2	1.32
relatives	11	7.29
friends	6	3.97
<b>Sufficiency of working capital</b>		
Sufficient	79	52.32
Not sufficient	72	47.68
<b>Number of working household members</b>		
None	111	73.51
One	17	11.26
Two	8	5.30
Three	10	6.62
Four	5	3.31
<b>Number of laborers</b>		
Below 5	96	63.58
5 - 9	38	25.16
10 & above	17	11.26
<b>Age of laborers (years)</b>		
60 & above	3	1.99
40-49	35	23.18
20-39	81	53.64
Below 20	32	21.19
<b>Average monthly family income (pesos)</b>		
20,000 & above	2	1.32
15,000--19,999	3	1.99
10,000--14,999	16	10.60
5,000--9,999	37	24.50
Below 5,000	93	61.59
<b>Av</b> <b>family income</b> - P5347.18		

**Duration in the business.** Less than half (39.73%) of the respondents were engaged in the bricks and tiles business for 15-19 years, while 25.17% were engaged in it for 10-14 years. This implies that almost two-thirds of the respondents found this business a promising one, thus, they perpetuate it as a source of livelihood. Less than one-fifth (14.57%) of the respondents could be considered pioneers in the business for they **had been** engaged in it for 20 years or more. Likewise, less than one-fifth were beginners, having been in the business for 59 years (12.58%) or 14 years (7.95%). The average bricks and tiles manufacturer was engaged in the business for 14.32 years.

**Nature of business management.** Almost all (90.73%) of the respondents claimed that they were single proprietors (owned and managed their business alone); 5.30% were in partnership with another; and 3.97% said that the business was owned by a corporation.

**Source of clay for production.** Most of the respondents (59.6%) said that they bought the clay used for producing bricks and tiles. Almost one-third (30.46%) said that the clay came from a rented/leased lot, while 9.93% claimed that the clay they used came from a lot owned by their family.

**Rent/lease of lot.** Among 46 respondents who got their clay materials from a rented/leased lot, 39.13% claimed they paid a monthly rental of P230, while 30.43% rented it for P200 monthly. A few rented the lot for P210 or P220 monthly (8.7% each); for P100 (6.52%); and for P90, P240, or P250 monthly (2.17% each). The monthly rental depended on the area of the lot.

**Price of clay.** Among the 90 respondents who bought the clay they used, 33.33% said each load cost them P101-300; 17.78%, P100 or lower; 16.67%, P301-500; 15.55%, P501-700; 11.11%, P701-900, and 5.56%, P900 or more.

**Starting capital in the business.** More than one-third (39.07%) of the respondents had a starting capital of P2,500-3,499; 32.45% started with a capital of P1,500-2,499; 17.88%, with P500-1,499; 5.96%, with a capital of less than P500; and 4.64%, with a capital of P3,500 or more.

**Source of capital.** Majority (86.09%) derived their capital from their own income. The others derived their capital from their relatives (7.29%), their friends (3.97%), cooperatives, and banks (1.32% each).

**Sufficiency of working capital.** More than half (52.32%) of the respondents had sufficient capital. They alleged that their capital was just enough for their production activities. Less than half of the respondents (47.68%) claimed that their working capital was insufficient.

**Working household members.** Each respondent was asked how many household members besides himself/herself were working. Majority of them (73.51%) said none, which implies that their household members were still young. Only 11.26% said that one household member was working; 6.62% mentioned three; 5.30%, two; while 3.31% mentioned four working household members.

**Number and age of laborers.** Asked how many laborers they had in their bricks and tiles business, 63.58% of the respondents claimed they had less than five laborers; 25.16% had five to nine laborers; and 11.26% had 10 or more laborers.

Most respondents (53.64%) said that their laborers were 20-39 years old. This implies that their laborers were at age of vitality and energy to do a muscle-rendering job as bricks and tiles manufacturing. Only 23.18% claimed that their laborers were 40-59 years old, while 21.19% said they were below 20 years old. Very few (1.99%) said that their laborers were 60 years old or older.

**Average monthly family income.** Majority (61.59%) of the respondents had an average monthly family income below P5,000. About one-fourth (24.5%) of them had an average monthly family income of P5,000-9,999, while 10.6% had P10,000-14,999. Very few had higher income. The average bricks and tiles manufacturer had an average monthly family income of P5,347.18. This implies that most of the respondents were below the income poverty line.

### Other Sources of Income

Aside from manufacturing bricks and tiles, the respondents revealed their other sources of income. Table 4 presents 20 different sources of livelihood which the respondents also indulged in, such as animal production, farming, government/private employment, commerce, tricycle/jeepney/bus operator/driver, laundry work, clerical job, technician, security guard, and teaching job. This implies that some respondents had permanent jobs but they manufactured bricks and tiles as source of additional income. On the other hand, other respondents had bricks and tiles manufacturing as their main job, but they had to indulge in other jobs to augment to their meager income from bricks and tiles industry.

**Table 4. Sources of income other than the manufacture of bricks and tiles.**

OCCUPATION	FREQUENCY OF MENTION	%
Pig producer	25	16.56
<b>Vendor</b>	20	13.24
Tricycle driver	19	12.58
Farmer	19	12.58
Poultry producer	10	6.62
Neighbor's helper	10	6.62
Government clerk	7	4.64
Private agency employee	6	3.97
Sales lady	6	3.97
Sari-sari store owner	5	3.31
<b>Vegetable producer</b>	5	3.31
Tricycle operator	5	3.31
Jeepney/bus driver	4	2.65

Table 4. Continued.

OCCUPATION	FREQUENCY OF MENTION	%
Worker in a restaurant	4	2.65
Laundrywoman	3	1.99
Teacher	3	1.99
Technician	2	1.32
Jeepney operator	1	0.66
Security guard	1	0.66
Bookkeeper	1	0.66

**Financial Assistance**

Table 3 shows that only 13.91% of the bricks and tiles manufacturers availed of financial assistance in the form of loans from relatives, friends, cooperatives, and banks. Table 5 shows the type of loan availed of by the borrowing respondents. An equal number of borrowers (47.62% each) availed of credit with a minimal interest of 1-5% per month and of credit from relatives/friends in the Philippines; only 4.76% borrowed from friends/relatives abroad.

**Table 5. Financial assistance availed of by the bricks and tiles manufacturers.**

TYPE OF CREDIT/LOAN AVAILED OF	NO.	%
	N=21	
Credit with minimal interest (1-5% per month)	10	47.62
Credit from relatives/friends within the Philippines	10	47.62
abroad	1	4.76

**Production and Marketing Aspects**

**A. Production**

The production aspects of the bricks and tiles industry assessed in this study included the kind, size, shape, texture, and quantity of products and the manner of molding, and firing these products (Table 6).

**Kind and size of products.** More respondents produced tiles (84.11%) than bricks (15.89%). According to them, tiles are more in demand for they are used as flooring, while bricks are used for decorating posts and walls and for landscaping, which are rarely done by construction companies.

The products were of different sizes. Among the bricks manufacturers, majority produced 2'x2'x8" bricks (54.17%) and 1'x8" (50.0%). A lesser number of bricks

**Table 6. Production aspects of the bricks and tiles industry in Vigan, Ilocos Sur, 1999.**

<b>PRODUCTION ASPECT</b>	<b>NO.</b>	<b>%</b>
<b>Kind of products</b>		
Bricks	24	15.89
Tiles	127	84.11
<b>Size of products (m)</b>		
<b>Bricks</b>	N=24	
1x1x8	12	50.00
2x2x8	13	54.17
4x4x8	7	29.17
1x2x8	10	41.67
1x4x4	3	12.50
1x4x8	2	8.33
2x2x8	2	8.33
2x4x8	3	12.50
<b>Tiles</b>	N=127	
1x4x4	8	6.30
1x8x8	73	57.48
1x10x10	106	83.46
1x11x11	38	29.92
1x12x12	62	48.82
Hexagon	2	1.57
	26	20.47
<b>Shape of products</b>		
Triangle	1	0.66
Rectangle	21	13.91
Square	140	92.72
Octagon	26	17.22
Rhombus	8	5.30
irregular	2	1.32
<b>Texture of products</b>		
Glazed	2	1.32
Un-glazed	149	98.68
<b>Manner of molding the clay materials</b>		
Manual	151	100.00
<b>Manner of firing</b>		
Open-pit	134	88.74
Close	2	1.32
No	15	9.93

Table 6. Continued.

PRODUCTION ASPECT	NO.	%
Material used in firing		
Firewood	142	94.04
Hay	129	85.43
Animal dung	81	53.64
Bamboo	56	37.09
Corncob	50	33.11
Rice hull	6	3.97
Manner of acquiring firing materials		
Bought	150	99.34
Asked from neighbors	1	0.66
Quantity produced daily (pieces)		
<b>Bricks</b>	N=24	
50-99	5	20.83
100-149	9	37.50
150-199	2	8.33
200-249	3	12.50
250 & above	5	20.83
<b>Tiles</b>	N=127	
357-426	2	1.57
287-356	5	3.94
217-286	15	11.81
147-216	50	39.37
77-146	44	34.65
7-76	11	8.66

makers produced 1'x2'x8" (41.67%) and 4x4x8 (29.17%). Very few made bigger-sized bricks.

Most of the tiles manufacturers produced 10" x 10" tiles (83.46%), 11" x 8" x 8" tiles (57.48%), and 12" x 12" x 12" tiles (48.82%). Others made 11" x 11" x 11" tiles (29.92%) and octagon-sized tiles (20.47%), which are made of eight sides measuring 11" on each side. Smaller sizes and hexagon-sized (six-sided) tiles were produced by only few respondents.

**Shape and texture of products.** Square bricks and tiles were made by the majority of the producers (92.72%); octagonal products by 17.22%; and rectangular products, 13.91%. Very few produced rhombus, hexagonal, and triangular products.

Almost all the respondents (98.68%) made unglazed products. They claimed that builders preferred unglazed to glazed tiles and bricks because unglazed products look natural and more antique than glazed products. Moreover, the process of making glazed products was more tedious to the respondents.

**Manner of molding the materials.** All the respondents molded the clay materials manually, that is, by using their hands and fonnns. According to the bricks and tiles manufacturers, molding machines were heavy and difficult to handle. In addition, they couldn't afford to buy machines because they were expensive ( fable 6) — —

**Manner of firing the molded products.** After the clay material had been molded into bricks or tiles, the manufacturers fired them to obtain the desired strength, density, shape, and structure. Majority (88.74%) of the respondents used open-pit firing, while only 1.32% used close firing.

**Materials used in firing,** The manufacturers used a variety of materials in firing the molded products, namely: firewood (94.04%), hay (85.43%), animal dung (53.64%), bamboo (37.09%), com cob (33.11%), and rice hull (3.97%). The respondents alleged that animal dung is a good firing material but there is not enough supply of animal dung, thus only half of the respondents could use it

**Manner of acquiring firing materials.** Almost all (99.34%) of the manufacturers bought firing materials. Only one respondent asked these materials from people in the neighborhood.

**Quantity produced daily.** Among the bricks producers, 37.5% could make 100-149 pieces daily, while 20.83% each could produce 50-99 pieces and 250 pieces or more daily. On the other hand, 39.37% of the tiles manufacturers could produce 147-216 pieces daily. Lesser number of respondents could produce less than 77 or more than 216 pieces daily.

## B. Marketing

The marketing aspects of the bricks and tiles industry in Vigan, Ilocos Sur assessed in this **study included** the selling price of *products*, the respondents' average monthly sales, place where the products were sold, and the buyers of the products ( fable 7).

**Selling price of products.** The selling price of the finished products differed according to size. Among the 24 bricks manufacturers, 54.17% sold 4xP x8" bricks at P150, while 41.67% of them sold 1'xP" x8" bricks at P1.00-1.50. The smallest sized bricks were sold at P0.50-1.00, while the biggest sized were sold at P2.50-3.50.

Among the tiles producera, 1"x4"x4" tiles cost P1.00-2.00. Tiles measuring 1x8"x8" cost P2.00-2.50, but to 42.52% of the producers these cost P2.50. On the other hand, 1'x10'x10" tiles cost P2.40-350 but 66.14% of the producers sold them at P3.40-3.50. Tiles measuring 1'x11x11 cost P3.50-30 and P"x12'x12" cost P4.50-5.30. Hexagon tiles cost P3.50 and octagon tiles, P2.80-00.

**Average sales per month.** Among the bricks manufacturers, 33.33% had an average monthly sales of P1,100-1,499, 29.17% had P700-1,099; 20.83% had below P700; and 16.67% had P1,500 or more. The average bricks producer had an average monthly sales of P1,082.83.

**Table 7. Marketing aspects of the bricks and tiles industry in Vigan, Ilocos Sur, 1999.**

MARKETING ASPECT		NO.	%
<b>Selling price per piece per size</b>			
<b>Bricks</b>		N=24	
Size in	Hice (pesos)		
1x1x8	P0.80	2	8.33
2x2x8	1.00	2	8.33
4x4x8	150	13	54.17
1x1x8	2.50	2	8.33
1x238	1.00--1.50	10	41.67
	1.10--2.50	2	8.33
1x4x4	1.00--1.50	3	12.50
1x4x8	1.10--2.00	1	4.17
	1.45--1.70	2	8.33
2x2x8	250--3.00	1	4.17
	3.50	2	8.33
2x4x8	3.50	2	8.33
<b>Tiles</b>		N=117	
1x4x4	1.00--2.00	2	1.57
1x8x8	2.00	2	1.57
	2.20	5	3.94
	2.40	5	3.94
	2.50	54	42.52
1x10x10	2.40--250	6	4.72
	3.00	1	0.79
	330	29	22.83
	340--350	84	66.14
1x11x11	3.50	1	0.79
	3.80	3	2.36
	4.00	1	0.79
	430	33	25.98
1x12x12	4.50	48	37.80
	4.60	11	8.66
	530	5	3.94
Hexagon	350	1	0.79
Octagon	2.80	3	2.36
	3.40	11	8.66
	3.60	1	0.79
	4.00	1	0.79
<b>Average sales per month (pesos)</b>			
<b>Bricks</b>		N=24	
Below 700		5	20.83
700--1,099		7	29.17
1,110--1,499		8	33.33
1,500 & above		4	16.67
<b>Average sales per month - P1,082.83</b>			



Table 7. Continued.

MARKETING ASPECT	NO.	%
<b>Tiles</b>		
Below 700	4	3.15
700--1,099	15	11.81
1,100--1,499	86	67.72
1,500 & above	22	17.32
<b>Average sales per month</b> P1296.35		
<b>Place where products were sold</b>		
In the house	129	85.43
Nearby provinces	10	6.62
Delivered to the construction site	8	5.30
In the market	2	1.32
In the cities	2	1.32
<b>Buyer of the products</b>		
Middlemen	126	83.44
Exporters	64	42.38
Contractors	17	11.26
Tourists/visitors	10	6.62
Cooperatives	5	3.31
Individuals (or home use)	5	3.31
Factories	3	1.99
Agent	1	0.66

On the other hand, the majority (67.72%) of the tiles producers had an average monthly sales of P1,100-1,499. Some (17.32%) had an average monthly sales of P1,500 or more, while a few had less than P1,100. The average tiles producer had an average monthly sales of P1,296.35

These findings imply that the bricks and tiles industry can augment to the income derived from other sources but cannot be the only source of income for it is insufficient to support even a family of three members.

**Place where products were sold.** Most of the respondents (85.43%) sold their products in their house. The rest sold their products in any of the following places: nearby provinces, construction sites, in the market, or in the cities.

**Buyers of the products.** The respondents had multiple buyers of their products. Majority (83.44%) of them sold their products to the middlemen, who, in turn, sold these in their stalls in the market or in other towns. They also sold to exporters (42.38%) and contractors (11.26%). Only a few sold their products to tourists/visitors, cooperatives, factories, agents, or individuals who used them for improving their houses.

ProblemsEncountered by Manufacturers

The bricks and tiles manufacturers encountered multiple problems related to the financial, material, manpower, production, and marketing aspects of their business (fable8).

Table 8. Problems encountered by bricks and tiles manufacturers in Vigan, Ilocos Sur, 1999.

PROBLEM	FREQUENCY OF MENTION	%
<b>Financial Problems</b>		
Inadequate capital	97	64.24
No capital	21	13.91
High interest of loans	19	12.58
Delaved payments	15	9.93
<b>Problemson material</b>		
High price of clay	120	79.47
Distance of clay source	24	15.89
High rent of clay lots	10	6.62
Scarce clay materials	10	6.62
<b>Manpower problems</b>		
Irregular laborers	57	37.75
Lack of laborers	29	19.20
High wages demanded	13	8.61
No problem	52	34.44
<b>Production problems</b>		
Working place is limited	81	53.64
Far distance of clay source	26	17.22
No place for working	25	16.56
Expensive materials	20	13.24
Increase of reject products	18	11.92
No place for firing	15	9.93
Display area is limited	10	6.62
Firing area is not spacious	9	5.96
<b>Marketing problems</b>		
Low price desired by buyers	129	85.43
No contact with buyers	48	31.79
Low price desired by cooperative	20	13.24
Difficulty in regaining capital/costs of materials	17	11.26
Difficulty in delivering	8	5.30

**Financial problems.** Inadequate capital was a problem of 64.24% of the respondents. They claimed that they needed more capital so that they can produce more bricks and tiles. No capital was a problem of 13.93% of them. Only a few had problems on high interest of loans and delayed payments.

**Problems on materials.** The respondents mostly encountered high price of clay (79.47%) but a few met problems on high rent of clay lots, scarce supply of clay materials, and the source of clay was far from their house.

**Manpower problems** These were met by 65.56% of the respondents and problems included irregular laborers, lack of laborers, and high wages demanded by the laborers.

**Production problems.** The respondents mentioned many problems concerning production. The most encountered problem was on limited working place (53.64%). Other problems met by only few respondents were: far distance of clay source, no place for working, expensive materials, increase of reject products, no place for firing, limited display area, and not spacious firing area.

**Marketing problems.** Low price desired by buyers was the most encountered problem as claimed by 85.43% of the respondents. The other problems met sparingly by the respondents were: no contact with buyers, low price desired by cooperatives, difficulty in regaining capital/costs of materials, and difficulty in delivering products because the place of delivery was far.

## Summary of Findings

### Demographic Profile

The data gathered in this study show that the average bricks and tiles manufacturer was 46 years old, male, married, and had young dependents who were his own children.

### Socio-cultural Profile

The educational attainment of the respondents and their spouses ranged from elementary to high school graduate, although there were more high school graduates than elementary graduates. Their fathers' educational attainment was slightly lower than that of their mothers. Most of the respondents' children were in Grade I-V. Majority of the respondents owned a house and lot.

### Economic Profile

The average respondent was a single proprietor engaged in the bricks and tiles industry for 14 years. Majority of the respondents bought the clay they used at a price ranging from P101-700 per load. Majority of them had a starting capital ranging from P1,500-3,999 which came from their own income. Only a few borrowed from the cooperatives, banks, relatives, and friends. More than half of them claimed that their working capital in the industry was sufficient. They had less than five laborers, majority of whom were 20-39 years old. The average bricks and tiles manufacturer had an average monthly income of P5,347.18.

### **Other Sources of Income**

The respondents were indulged in other sources of livelihood aside from manufacturing bricks and tiles. Some of these were animal production, farming, government/private employment, commerce, vehicle operator/driver, security guard, teaching job, and others.

### **Production Aspects**

Majority of the respondents produced square, unglazed tiles of different sizes; only a few produced unglazed bricks. These were manually molded and open-fired. The materials used in firing the molded products were firewood, hay, and animal dung, which the manufacturers bought. More than half of the bricks manufacturers produced 50-149 pieces daily while majority of the tile manufacturers produced 77-266 pieces daily.

### **Marketing Aspects**

The average bricks manufacturer had an average monthly sales of P1,082.83 while the average tiles producer had an average monthly sale of P1,296.35. They sold their products primarily to middlemen in the manufacturers' houses.

### **Problems Encountered**

Most of the producers encountered problems on inadequate capital, high price of clay, irregular laborers, limited working place, and low price of sold products.

## **Conclusions**

Based on the findings of this study, the following conclusions were drawn:

1. The bricks and tiles industry can augment to the income derived from other sources but cannot be the only source of income for it is insufficient to support a family of three members.
2. The bricks and tiles manufacturers used traditional method hence, low production was achieved.
3. The industry was beset by financial, material, manpower, production, and marketing problems.

## **Recommendations**

Based on the findings of this study, the following recommendations are hereby forwarded:

- I. Procuring clay during the rainy season is quite difficult since the clay is sticky when wet. Thus, the bricks and tiles manufacturers should buy and stock up the

- clay materials during the dry season so that they won't run out of stock during the rainy season.
2. The bricks and tiles manufacturers should buy and use molding machines so that their production would increase and be facilitated. Since the respondents alleged that they didn't know how to manipulate these machines, a training on the use of such would be necessary.
  3. To improve their production, the manufacturers should also buy and use an electric kiln for drying their molded products. This would facilitate firing activities especially during the rainy season, when it is impossible to use open-pit firing. With the use of the kiln, the manufacturers would have continuous production of bricks and tiles the whole year round
  4. The study found out that animal dung was a good firing material but supply was inadequate. An information campaign should be done enjoining animal raisers, particularly those who raise cows and carabaos, to dry and store their animal dung so that a ready supply of this material would be made available for sale to the manufacturers when needed.
  5. The bricks and tiles manufacturers should organize a cooperative so that they would have a collective bargaining power especially in the marketing aspects. Moreover, their problems would be minimized or solutions to these would be facilitated if they were united and organized.
  6. The University of Northern Philippines should conduct skills training on bricks and tiles manufacturing, particularly in the use of molding machines and kiln and in improving the designs of bricks and tiles so that the manufacturers would improve the quality of their products, thereby, improve the bricks and tiles industry, in general.

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