CHAPTER IV
PROBLEMS AND POTENTIAL OF MAIZE PRODUCTION

This chapter will provide information about household maize objective, farmers' use of maize and problems and potential of maize production in the study area. This will give a good background to further analysis of profitability and adoption of hybrid maize varieties.

4.1 Household maize objective

Maize is generally grown for cash only by either small or big holders of cultivated land. From Table 3.8, we can see that farmers have different size of maize area. However, hybrid maize farmers used 1.6 percent of total output (Figure 4.2) for home consumption and remaining 98.4 per cent for cash earning. Local maize farmers used 2.5 per cent of total output for seed, 5.1 percent for home consumption and remaining 92.4 per cent for cash income (Figure 4.1).

4.2 Farmers' use of maize

By tradition, there are two kinds of maize varieties grown, the local varieties, the white flint and white glutinous type, and yellow dent hybrid varieties introduced from other countries. There are different uses of maize in Cambodia. Maize is used for animal feed about 60 per cent of the total production, 20 per cent as human food, 15 per cent as industrial product, and 5 per cent as seed for next season. Yellow hybrid maize mostly sold for animal feed is exported and some is use domestically by Charoen Pokphand Company (CP). Small number of farmers also used hybrid maize as livestock feed. While, white maize is generally used domestically as human food. Yellow hybrid maize cultivated area has increased up to 76.4 per cent by 2004, while it was 25 per cent during 1995.

In the study area, yellow maize products from both hybrid and local varieties are mostly exported to Vietnam and a small amount is used domestically as animal feed, seed (Local maize only), and human food such as vegetable, some kinds of cake and as boiled corn. Generally, for local maize growers (Figure 4.1) used 50-350 kg (about 7.6 per cent of total output) of the maize product per household for home consumption, animal feed, and seed for the next season, while hybrid maize growers used 0- 250 kg (about 1.6 per cent of total output) for home consumption and animal feed (Figure 4.2). Some farmers use corncob as firewood, while the other sold it for cash. Maize plants removed from thinning are used as animal feed.

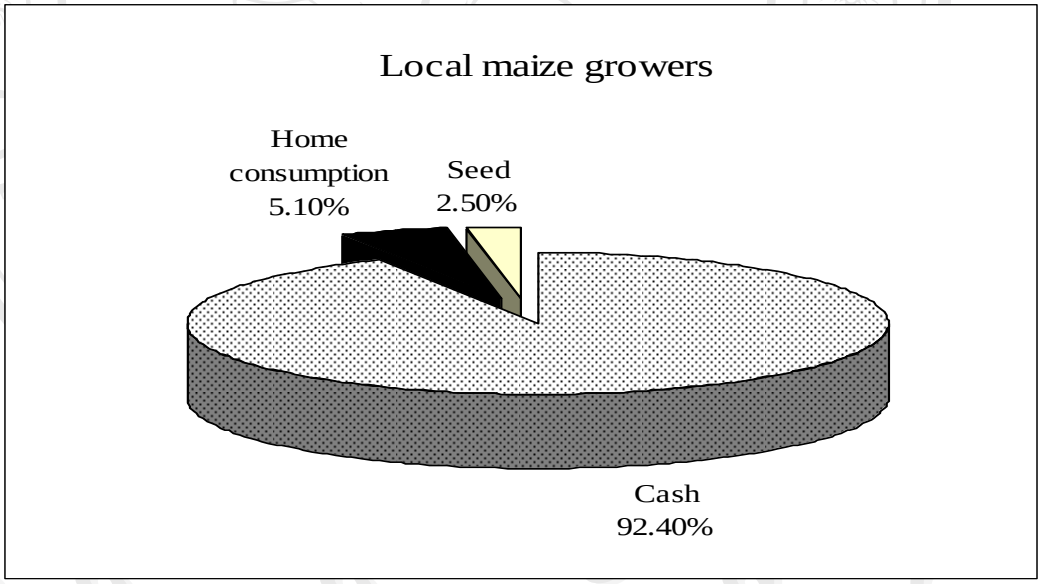

Figure 4.1 Use of local maize output by farmer households
Source: Survey, 2004

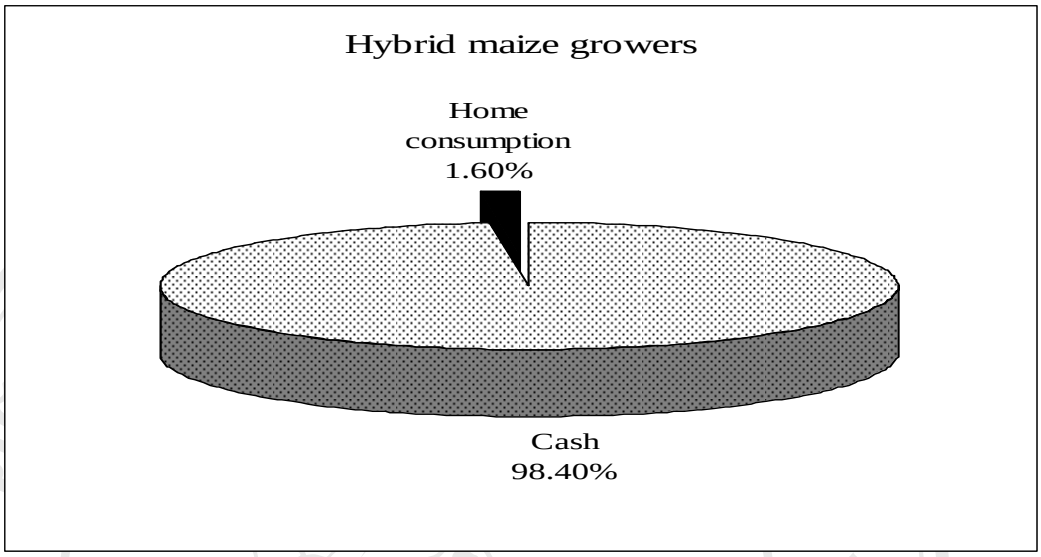

Figure 4.2 Use of hybrid maize output by farmer households
Source: Survey, 2004

4.3 Problems of maize production

4.3.1 Rainfall and flood

In the study area, cropping patterns are determined, primarily by, duration and amount of available rainfall and flooding period. It floods every year for three to four months, i.e., from September to early or late December with a depth of water from 1.5-2.5 m. To avoid floods before harvesting, farmers in the area grow local or hybrid maize varieties of short maturity duration. The duration of maturity of the maize varieties grown there is not more than three and half months, so there is limited choice of varieties for them to grow. During flood period, farmers can not grow any crop.

4.3.2 Irrigation

Irrigation, though generally not a problem during the wet season, but it can be very important to the cropping system in the area because the farmers start growing maize only when rainfall starts. In some years, rainy season starts late, so the farmers who do not have irrigation system have to wait for the rainfall, if the rainfall is too late

in the season, they cannot harvest maize on time because of flooding, or they have to change to grow other crop instead. There are many natural channels in the study area which are the source of water that can suffice irrigation requirement, but most these channels become shallow and flow at a higher level than Bassac river draining out water to the river during the season of low water. If the channels could be repaired to enable farmers retain to water for irrigation in dry season, maize production will be increased in the area because all farmers can grow 2-3 crops of maize per year and will not face the situation of losing their maize yield because of floods before harvesting or because of droughts.

4.3.3 Seed

High seed cost is the main problem for hybrid maize growers in the study area and it is a constraint mainly for rainfed areas because they rely heavily on rainfall, if rainfall is not good, they will lose or not so much profit after paying back seed cost as a credit, 18 percent of total cash expenses. All farmers complain about high cost of seed and they would welcome seed cost reduction.

4.3.4 Production problem

Currently, local maize varieties produce relatively low yield as compared to hybrid maize. Figure 4.3 indicates that 53 per cent of nondadopter farmers got maize yields between 1,500 – 2,000 kg per ha. On average, local maize varieties obtained a yield of 1,704.7 kg/ha with (Table 4.1) with a deference of 58.5 per cent lower than hybrid maize in rainfed condition and 75.6 per cent lower than hybrid maize in irrigated condition. Farmers found that their yield of local varieties have gone down drastically from initial yields of 2,500 – 3,000 kg per ha. Hybrid maize production has been produced since 2002 in the study area, and then there were many problems of pest to the local maize production because they never apply any pesticide to local maize production, while hybrid maize production did not face such problems.

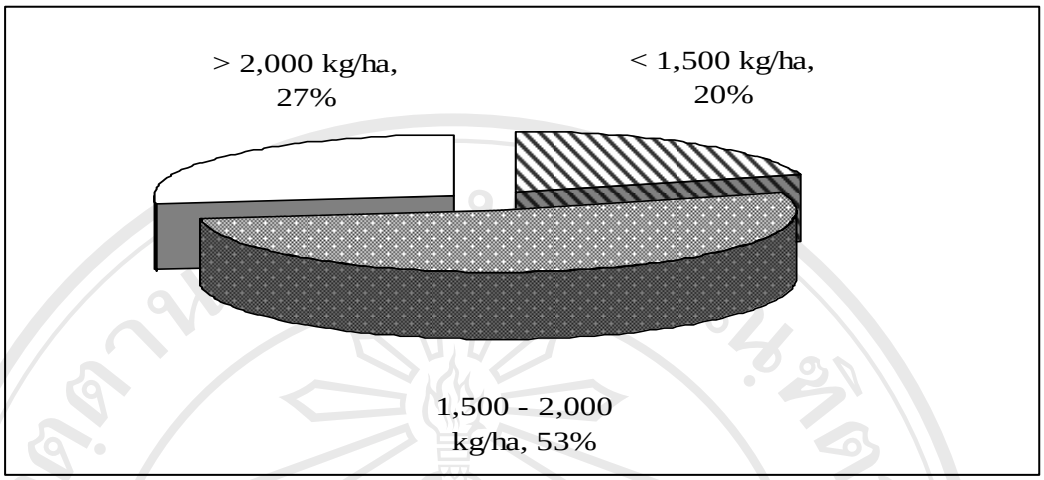

Figure 4.3 Percentage of local maize yield in the study area
Source: Survey, 2004

Table 4.1 Average minimum and maximum yields of local and hybrid maize sold as dry grain

Maize types	Average yield	Minimum yield	Maximum yield	Standard Deviation
Rainfed Condition				
Local maize (kg/ha)	1,704.7	740.0	2,670.0	509.6
Hybrid maize (kg/ha)	4,113.0	3,090.0	5,600.0	809.8
Irrigated condition				
Hybrid maize (kg/ha)	6,994.7	4,745.0	7,863.0	802.2

Source: Survey, 2004

4.3.5 Institutional constraints

Both government and non-government organizations are not much involved in the maize production in the study area yet. Farmers rely heavily on private companies located in Vietnam about their new technologies of growing hybrid maize, applying chemical fertilizers and pesticides, and market. Generally, companies are concerned only with their profit; they will not care much about environmental impact. Hybrid maize growers tend to use chemical fertilizer and pesticide. Moreover, hybrid maize

seed is already protected from diseases before planting by application of fungicide. Some disparities exist between hybrid and local maize producers. Now, local maize growers started complaining about decreasing their maize yield because of pest problem caused by hybrid maize production in their area. They are concerned that their maize yield in the future will keep declining or could be recovered.

4.4 Potential of maize production

4.4.1 Geography and soil fertility

Water sources: Bassac river with 118 natural channels is the main source of water supply for living and crop production among the people in the study area. Even if some of the channels could not contain water during drainage the dry season, but it is also a potential of maize production in the future because it can contain more for maize production of existing structure with further upkeep and maintenance.

Geography: The study area is located near Cambodia-Vietnam border and along national road providing a good potential for accessing export channel and import market of input and output of maize. Moreover, cost of production can be reduced. Table 4.2 indicates that price of maize in area near border (Sopaupoun Commune) was higher than area farther away from border.

Soil fertility: The study area is in the lowland area with high soil fertility and it is along the Bassac River. The river brings alluvial soil to the cultivated area through floods. The farmers report that their maize yield was up to 2.5-3 t/ha without applying any chemical fertilizer without major disease incidence. There is a good potential for further increase in yield and production if hybrid varieties are grown with application of fertilizer and pesticide.

4.4.2 Market of maize

Maize production in the study area is almost totally dependent on the Vietnamese market, which is an important entry point of exporting maize to Vietnam. The entry point is Long Ben gate. Some maize products from northern part of Cambodia were also exported to the gate in 2004 because of higher price of maize at the gate than the other gate located at north of Thai border. Maize are sold as dry ears or fresh ears, it depends on the buyers. However, there is less demand of fresh ears than for dry ears. The buyers are mostly Vietnamese. All of the farmers sell their products at the farm gate; some sell it as wet grain and the others as dry grain. Its prices (Table 4.2) vary depending on time of selling, proximity to border, type of output like dry ears or fresh ears and dry or wet, and color of maize (white or yellow). The survey found that 28.5 per cent of maize growers sold their output immediately after 5-7 days of harvesting. While, the remaining 71.5 per cent kept it for a month or two months before selling.

Table 4.2 Price of local and hybrid maize by output types and areas

Study Area	Dry ears		Fresh ears (whole sell)	
	Hybrid Maize (Riel/kg)	Local Maize (Riel/kg)	Hybrid Maize (Riel/ha)	local Maize (Riel/ha)
Sompovpuon	400-440	400-850	2,900,000	*
Prek Thmey	350-400	350-900	*	833,333
Chroy Takoe	350-400	350-850	*	*
Poubarn	350-400	350-850	*	700,000

Source: Survey, 2005
Note: * No collected data
1US$ = 4,075 Riel (March 2005)

4.4.3 Credit

In general, hybrid maize farmers in the study area depend heavily on borrowed capital such as seed, fertilizer and pesticide from agro-chemical retailers. They are allowed to pay back after harvesting with the interest rates of 6.3-6.7 per cent, 8 per cent, 8-10 per cent per season for seed, fertilizer and pesticide, respectively (Table 4.3). If the farmers cannot pay it back in the current season, because of low yields, they can pay it in next season without doubling the interest. This is an important service that farmers have with the agro-chemical retailers in case of low yield or crop failure as they do not have to incur extra loss.

Table 4.3 Market price and credit price of inputs of maize production

Items	Unit	Market Price (Riel/Unit)	Credit Price (Riel/Unit)	Interest rate
Seed (919)	kg	7,500-8,000	8,000-8,500	6.3-6.7%
Fertilizers	bag	60,000	65,000	8.3%
Pesticides	bottle or kg	3,000-10,000	3,300-11,000	10.0%

Source: Survey, 200
Note: 1US$ = 4,075 Riel (March 2005)