

Appendix A : Agricultural Production and Rice Balance

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Appendix A : Agricultural Production and Rice Balance

A.1 Agricultural Production

A.1.1 Rice Ecosystems and Cropping Patterns by Region

Rice ecosystems in Cambodia are diversified and can be classified into four (4) systems as follows:

- (a) **Rainfed lowland rice:** This ecosystem is grown in bunded fields that are almost completely dependent on rainfall and runoff water. The depth of floodwater can range from 0 to more than 25cm. However, depths of 50cm or more may be experienced for short periods.

Rainfed lowland rice is cultivated in all the provinces of Cambodia. However, the largest areas are around the Tonle Sap, the Tonle Bassac River, and the Mekong River. The farmers broadly classify rainfed lowland areas based on three varieties of mature rice groups, namely early, medium and late duration rice. Early duration varieties are grown in 20 percent, medium duration in 41 percent and late duration in 39 percent, of the rainfed lowland areas. The early varieties are grown in high fields, medium varieties in middle fields, and late varieties in low fields of the rainfed lowland areas. In general, the high fields are generally more drought prone while the low fields are more floods prone.

In the early group grown on high fields, the rice consists of both photoperiod sensitive and photoperiod insensitive varieties. Generally, photoperiod sensitive varieties are short day plants, and flower and mature at determinate periods of the year, while the photoperiod insensitive varieties do not require short day to set flower; their maturity depends on specific period of time after they are sown. In medium and late groups, only photoperiod sensitive varieties are grown.

- (b) **Dry season rice:** Dry season rice in Cambodia represents about 8 percent of the total cultivated rice area. It is fully or partially irrigated and most variable among all rice ecosystems in terms of cultivation time, cultivation method, topography and soil type. However, it is the most productive ecosystem. Its high productivity is associated with better water control, higher light intensity during crop growth, and the development and cultivation of fertilizer-responsive high yielding varieties.

Dry season rice is of two categories. The first category is the fully or partially irrigated second crop after the wet season of rainfed lowland rice production. There is diversity in the crop growing period from seedling bed establishment to harvesting. The most common is from late October to late March. This is called early dry season rice where the seedling and vegetative growth depends on late wet season rainfall and residual soil moisture; while the other stages depend on irrigation. Another cropping period is from December to early May. Crop establishment can start from early December to early January. This cropping period, which is

called late dry season crop, involves the low fields, and the need for irrigation is greater than in the early dry season crop.

The second category of dry season rice is the partially irrigated flood recession rice. The areas are flooded for 3-5 months before water recession takes place. These are largely the flood receding areas of very deepwater lands around lakes, rivers, and water reservoirs that are not suitable for deepwater rice cultivation because the water rise is too rapid. Also included are some wet season deepwater rice areas that have been converted for dry season rice cultivation, because higher and more reliable yields can be expected. Flood recession fields are level paddies situated on sloping areas. Sequential cultivation is conducted as waters recede. The upper fields are the first to be cultivated and the lowest fields are the last. Sowing can start as early as late October and as late as February. Harvesting is from mid-February to April. In some places, sowing is from late March to April and harvesting can be as late as the end of August.

Unlike the rainfed lowland ecosystem where field levels correspond to different maturity classes, the dry season crop involves only photoperiod insensitive varieties that mature not more than 120 days.

(c) Deepwater or floating rice: Deepwater rice is grown in low-lying areas and depressions that accumulate floodwater at a depth of 50cm or more and in some places the water depth can be as deep as 4m. The floodwater comes from the Tonle Sap, the Mekong and Tonle Sap – Bassac rivers. Their tributaries flood the low-lying areas and depressions, a portion of which is planted with deepwater rice. Generally, the water rise in these areas is always intensified by local rainfall.

Production practices of deepwater rice are relatively simple and involve very minimal inputs. The farmers usually begin the cultivation with the burning of straw and stubble remaining in the fields. This practice takes place between February and early April. The unbunded field is ploughed once or twice, after which dry seeds are broadcasted. Seeding time in the southern provinces including Takaev, Prey Veang and Kandal is usually from late April to May, while in the northern provinces such as Bat Dambang, Banteay Mean Chey and Siem Reap, it is from May to mid June. In general, the lowest part of the sloping area is the first to be cultivated because it is the first to be flooded. Seeds may be incorporated into the soil by harrowing or ploughing. Early planting is always carried out so that the crop is more grown up when floodwater comes. Older plants sustain elongation to escape from water rise better than younger plants and are therefore flood resistant.

(d) Rainfed upland rice: Upland rice in Cambodia, also known as mountain rice, is grown in unbunded fields that are scattered in rolling lands, some of which are mountains. Upland rice depends entirely on rainfall. The upland rice area is a small portion of total rice land in Cambodia. The leading upland rice growing provinces are Rotanak Kiri, Kampong Cham and Siem Reap. Mondol Kiri, Kampong Thum, Kandal, Kaoh Kong, Preah Vihear, Stueng Traeng,

and Kampot also grow upland rice with smaller areas. In Rotanak Kiri and Mondol Kiri, upland rice is the major rice ecosystem, and in Rotanak Kiri the upland rice area is more than twice the area for rainfed lowland rice.

Activities of cropping pattern within each ecosystem are presented in Figure-1, and the statistics on paddy production is presented in Table A.1 appended.

Figure-1 Rice cropping pattern in each ecosystem

	Month											
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Rainfed lowlands medium and long duration, photoperiod sensitive and nonphotoperiod sensitive varieties												
Land preparation		←→	←→	←→	←→							
Seedbed			←→	←→								
Transplanting				←→	←→							
Harvesting									←→	←→		
Rainfed lowland broadcast rice												
Land preparation		←→	←→	←→								
Broadcasting			←→	←→								
Harvesting									←→	←→		
Rainfed lowland, supplementary irrigation (from Seeded to harvest)												
Early rice	←→	←→	←→									
Medium rice					←→	←→	←→	←→	←→			
Recession rice												
Land preparation		←→	←→	←→						←→	←→	
Seedbed	←→	←→							←→	←→		
Transplanting		←→	←→								←→	←→
Harvesting	←→				←→							
Deepwater rice												
Land preparation	←→	←→	←→								←→	←→
Seeding	←→	←→	←→									
Harvesting										←→	←→	
Upland rice												
Land preparation (slash & Seeding)	←→	←→	←→									←→
Weeding			←→	←→	←→							
Harvesting					←→	←→	←→	←→	←→			

A.1.2 Production Technology and Yield

The discussion below is based on production practices in each rice ecosystem.

(a) Rainfed lowland rice: In this ecosystem, upper fields with standing water between 20-30 cm are planted with early varieties, and medium fields with standing water between 20-40 cm are planted with medium to medium-late varieties, while lower fields with deepest standing water between 40-60 cm. are planted with late varieties. Early varieties are subsistence rice with good volume expansion of cooked rice. Medium varieties offer best cooking quality and acquire best selling price, while late varieties also possess good cooking quality and good grain weight.

Nursery bed establishment: This is a necessity for transplanting fields and is usually prepared near the home where good water control is possible. Plot size of nursery bed per ha rice field ranges from 0.1 to 0.2 ha, and seeding rate varies from 60 to 120 kg/ha, depending on germination rate of seeds.

Crop establishment for transplanted rice: The field is ploughed twice and harrowed once or twice. Plowings aim to destroy weeds, and harrowing to prepare the land for transplanting that starts with uprooting of the seedlings in the nursery. Number of seedlings per hill is 2-3 for vigorous seedlings, and 5-6 or more for less vigorous seedlings. In general, there are more hills per m² when the soil is less fertile or when seedlings are less vigorous.

Crop establishment for broadcasted rice: The seeds to be broadcasted may be dry seeds or pre-germinated seeds. Land preparation practices employed before broadcasting are similar to those done for transplanting fields. Broadcasting dry seeds, especially of late varieties, is common in the northern provinces where labor shortage exists.

(b) Dry season rice: The dry season rice, which is fully or partially irrigated, is the most variable among the rice ecosystems in term of cultivation time, method, and land topography. However, it is the most productive rice ecosystem in association with better water control, higher solar radiation during crop growth, and the development and cultivation of high fertilizer responsive modern varieties.

Several cultivation strategies and practices in the dry season rice production are similar to those of the rainfed lowland rice production. One major difference between the two ecosystems is the ability to control water in the dry season rice production.

Flood recession rice has the distinct characteristics of having short, staggered cultivation intervals. Sowing in the nursery bed is done several times within 5-10 days intervals. This is essential to obtain seedlings at the correct age for serial transplanting as the water recedes down the slope.

Therefore, different stage of rice growth can be observed over a small area. In some flood recession areas, land preparation is done after harvest, before the floodwater rises. After the flood recedes, additional tillage may be done. In some areas, as in Siem Reap, where the flood water is clear, dry seeds are broadcasted in areas where the flood water is about to recede.

(c) Deepwater rice: Production practices for deepwater rice are relatively simple and involve very minimal external inputs. The practice starts with the burning of straw and stubble remaining in the field after grazing by cattle. This takes place between February and early April. The unbounded field is ploughed once or twice before dry seeds are broadcasted. Seeding time in the southern provinces including Takaev, Prey Veang, and Kandal is from late April to May, while that in the northern provinces such as Bat Dambang, Banteay Mean Chey, and Siem Reap is from May to mid-June. In general, the lowest part of a sloping deepwater rice area is the first to be cultivated, being the first to be un-inundated.

The average rate of seeding ranges from 120 to more than 200 kg per ha. The higher rate is usually used when the soil is ploughed only once. However, the second plowing generates better soil structure for rice plant establishment and growth, and destroys weeds which remain after the first plowing. Seeds may be incorporated into the soil by harrowing or plowing which further improves soil structure and thus favor good root development. The resulting soil cover also protects the rice seeds from birds and rats. If soil moisture is sufficient, germination takes place a few days after sowing. It can be delayed for weeks, depending on rainfall.

Early planting is always desired so that the crop is more mature when the floodwaters come. Older plants sustain elongation better than younger plants and are, therefore, flood tolerant. Seedlings obtained from thickly populated section of the field may be transplanted in vacant spaces when water starts to accumulate in the field.

(d) Rainfed Upland Rice: Upland rice can be grown at elevation ranges from 200 to 1,000 m. At high elevation where daily temperatures are lower, varieties should possess some degree of cold tolerance. Some areas are favorable in term of water regime while others are drought-prone. The latter should require varieties with drought tolerance and good drought recovery.

Major upland rice cultivation practices in Cambodia, like in all its neighboring countries having upland rice cultivated on relatively high elevations, are associated with shifting cultivation or the slash and burn method, in which the forest is cleared and planted with rice for 2-3 years before farmers shift to a new area. The farmers often return to the old upland rice site after several years of fallow. This method is practiced in the north and northeastern provinces, and in hilly, forested areas of other provinces.

In the cultivation method, trees and other plants are cut, left to dry, and burned during the dry season of February to April. Seeding is between April and June. Without tilling the soil, seeds are simply drilled into the soil with the assistance of pointed sticks. The seeding rate ranges from 5 to 20 seeds per hill, and hill spacing can range from 20 to 40 cm. However, closer spacing is used in old fields which are less fertile and for a new field it is vice versa. Wider spacing is used in parts of the field where rice is mixed with other crops. The crop is totally dependent on the native fertility of the soil.

Only rainfed lowland rice and dry season rice fields receive care taken in terms of crop protection and fertilizer application after planting is done.

For crop protection, hand weeding is common, and the number of weeding depends on weed intensity. The thoroughness of land preparation as well as the frequency and duration of time when there is no standing water in the field determine weed intensity. Herbicides are seldom used.

Rats are usually controlled by digging their holes and killing by using sticks. Other control methods include chemicals, traps and mechanical barriers like plastic sheets. Crabs are a major source of food in the farm. They are commonly controlled by hand picking during the young stage of the rice plants. They are rarely controlled by chemicals and pesticides. Chemical control of insect pests is not common except in some fields.

For fertilizer, composted farmyard manure or manure composted with rice straw or dried leaves is the most common fertilizer used in the nurseries and fields. Chemical fertilizers may also be used in the fields. If fertilizers are applied, the high fields of early duration rice commonly receive more fertilizer than the lower fields.

Deepwater rice and upland rice rarely receive any post-planting application. For deepwater rice, it is deep standing water in the fields after flood water rises, that makes further cultivation practices difficult. Upland rice, on the other hand, is normally left dependent on natural conditions.

For harvesting, the operation is done solely by hand tools, or sickles. Rice is cut about 50 cm below the panicle and banded in bundles. In the wet season, bundles are sun dried a few hours in the field and then they are carried to the house and hand threshed after which the paddy grains may be dried for one or two days before putting in storage. In the wet season threshing machines are not commonly used, especially in southern provinces, for two main reasons. The first reason is that the farmers want to keep the straw for their animals. The straw from machine threshing is profoundly beaten and is too bulky to pile up and decay rapidly. Secondly, at harvesting time of wet season rice, the soil is still wet and many planted varieties do not mature at the same time.

These make it difficult for the machine thresher to go into the field. However, in the dry season, machine threshing is common in most of the large rice production areas.

As for the yield, rainfed lowland rice usually produces between 1.0 and 1.2 ton per ha. Dry season rice is the most productive among all ecosystems and give average yields as high as 2.7 ton per ha. In deepwater rice, the average yield is 1.2 ton per ha, and in upland rice the average yield is less than 0.6 ton per ha.

A.1.3 Process of Post-harvest Technology

In Cambodia to date, rice post-harvest technology is relatively limited, and this ultimately affects the rice marketing to a great extent. From documentary review and farmers' storage study conducted by the Study Team, it was revealed that storage losses are high due to lack of moisture control at storage. Contamination by mold and stored insect pest infestation occur rapidly in low quality storage facilities. The most three prominent stored insects found in the study were rice weevil (*Sitophilus oryzae*), corn weevil (*S. zeamais*), and rice moth (*Plodea punctella*). In addition to the losses caused by mold and stored insects due to the paddy being stored at relatively high moisture content, there are no measures to prevent feeding by birds, rats, nor even the farmers' own chickens. Furthermore, during grain drying activity in the frontyard of the house, the drying grain is usually attacked by such kinds of animal as chicken, duck, pig, and cow.

So it is evident that if Cambodia aims to export its rice surplus to international markets (as is anticipated through improved production), a definitive rice improvement program and effective agricultural extension services are urgently needed. Farmers should be extensively trained to properly conduct post-harvest handling.

Some brief discussion on post-harvest practices being conducted by Cambodian farmers, from harvesting to milling are described in the main report (Chapter 3.4) and Appendix B.

A.1.4 Access to Markets

Most Cambodian farmers are subsistence farmers who produce rice primarily for family consumption. With generally unfertile soil, and most paddy fields under rainfed conditions, Cambodian rice yields are among the lowest in the world, approximately 1.64 ton/ha.. Given this and with low land holdings, each Cambodian farmer generally produces 1 - 3 ton/year. The field Study Team learnt that even in areas where two rice crops were planted, not many farmers produced even 5 ton annually.

Per capita intake of paddy in Cambodia is averaged at 245 kg. With a 5.2 farm family members (national average), about 1,274 kg would be required per household in a year. This simple

calculation indicates that even though the country is having a rice surplus and trying again to be a rice exporter, some farmers cannot produce enough rice to feed their households and still have to buy the deficit.

Nevertheless, the majority of the farmers have a surplus to sell. Discussion about access to markets will be based on this assumption.

The biggest rice surplus areas are in the South as well as Bat Dambang and Banteay Mean Chey. At the field level, there are many different channels for the marketing of rice. For a clear understanding of rice marketing in the production area, the different practices are consecutively listed below:

1. The farmers sell paddy to a collector at the farm. This is the most common practice.
2. Farmers may transport a small quantity, 40 - 50 kg, on a motor bike and sell to the village millers, some of whom collect paddy and mill for the rice market. Other farmers may take this small amount and sell it to a small scale commercial mill.
3. Several farmers hire a truck together to transport paddy and sell to the mill.
4. Some farmers mill their paddy at the village mill. They then sell the rice either at a small rural market or at the closest district or provincial market. These farmers may sell the milled rice to market retailers, or occasionally take a place themselves in the market for retail selling.
5. Retailers most commonly buy rice directly from the mill or from a trader who delivers from the mill. They may also buy rice from farmers, or buy paddy from farmers, and have it custom milled themselves.
6. Each farmer usually uses more than one channel for selling paddy and rice. Most of it, about 46 percent, is sold to a collector at the farm. Some quantity is sold at the market or at the mill. The farmers sell to any combination of collectors, millers, wholesalers, and consumers.
7. The highest price is usually obtained between August and October. This is the transition period where the last season's supply is almost exhausted and only a small amount of the early new rice is available in the market.

The largest rice market is in Phnom Penh. Most rice from the Southern Provinces comes straight from the Provincial mills to the main market in Phnom Penh, where it is purchased by both retailers and rice shops found near the market. A large quantity is also sold by the millers directly to the government institutions to supply to the army and police; and sold to hotels and restaurants. Some of the rice coming from Bat Dambang passes through these shops near the railway station and some of it is sold directly to market retailers. However, some of the rice from Bat Dambang and Banteay Mean Chey flow illegally across the border into Thailand.

It is common to find street rice shops around the markets throughout the country. These are retail shops but they also sell to other retailers and traders. Their turnover and stocks are generally higher

than retailers in the markets. They usually sell larger quantities per customer and thus can afford slightly lower price than the market retailers.

At this point it is appropriate to briefly discuss rice marketing in the neighboring countries. Thailand is a good example as its rice industry is more equipped and better organized than any other rice exporter in Southeast Asia.

In Thailand the paddy flows into the market channel in three ways:

1. Farmers sell paddy to the collector at the farm;
2. The farmers transport and sell paddy to a miller nearby. The quantity may range between 3 and 5 ton. If the quantity is as high as 20 ton, the farmers will together hire a truck for transport..
3. The farmers transport paddy to a nearby paddy market which practice is becoming more and more popular. At the market the paddy is sold to the millers, mill brokers, and traders. The selling price is competitive and depends on the quality of the paddy.

Paddy is milled by commercial mills, 50 ton/day and over, and sold to the wholesalers in the area. Retailers buy rice from wholesalers; however, some of them may buy directly from the mill. The surplus after local consumption is transported to Bangkok and the markets nearby the capital where rice is sold to wholesalers, retailers and exporters. In Bangkok there are several central markets that handle marketing of rice and other agricultural produce, as well as consumer goods. Large rice companies have their own lots located in these markets for rice trading. They carry a small stock and business is done primarily with retailers. Wholesale trading is now done through telephone calls or e-mail orders and delivery follows.

A.1.5 Problems and Constraints in Rice Production

There are many problems and constraints limiting access of Cambodian agricultural produce to the market. They are briefly discussed below.

- (1) **Low quality of agricultural produce:** Agricultural produce in Cambodia, which is raw materials for further processing, are usually of low quality. In turn, processed products do not meet international standards in overseas markets. This is the main constraint to the marketing flow of agricultural surplus, resulting in low commodity prices.

With rice, Cambodia is now self-sufficient since 1995 and is aiming at exporting. However, due to the low quality of paddy, in terms of grain size, uniformity and poor milling appearance, Cambodian rice cannot compete with the produce of other exporters. Besides the domestic market, Cambodian rice only flows to the Thai and Vietnamese borders, where rice trading across the border is still illegal.

The low quality of Cambodian paddy is due to many factors. Among them are: the lack of knowledge by the farmers on how to improve their rice farming, the lack of good seed sources, poor post-harvest handling, and insufficient effective agricultural extension services to guide the farmers in appropriate practices.

- (2) **Poor transportation system:** This includes poor roads, bridges, and illegal road taxation. The costs of delayed transport due to bad roads, bridges and illegal taxes all add to the cost of the produce. In some cases, rice cannot even reach some domestic markets because there is no access to the end point.
- (3) **Inadequacy of information on international trade and marketing:** In spite of the importance of information on international trade and markets when dealing with overseas markets, the Cambodian government and businessmen still lack access to this network. Trade relations between Cambodian agricultural products and international markets and buyers have yet to be established successfully.
- (4) **Poor physical and marketing infrastructure:** This topic has been partly discussed in (2). However, marketing infrastructures serve as a physical framework for economic activities. The main obstacle to more efficient trade is the poor road conditions. Transport infrastructures were destroyed during the civil war period, isolating farms from their markets.

Most of the local retail markets at the village, district, or town level are generally in poor condition and have low capacity. Even though the government is considering improvement of existing facilities and services for marketing operations, investment from the private sector is of a high priority. Paddy markets should be established to create a competitive price for paddy among the traders, so that the farmers can receive a fair price. In turn, the paddy markets will facilitate traders with a ready source of paddy.

- (5) **Lack of producer associations:** The Phnom Penh Chamber of Commerce has been established. Rice Millers' Associations at Provincial levels, in the Northern and Southeastern Provinces have also been created. A National Rice Millers' Federation was established in May 2000. These are all launching points for Cambodia to foster the rice milling industry and rice business. However, the establishment of Producers' Associations should also be promoted. With this the farmers can develop their negotiating power with traders. This negotiating power can also be effective when purchasing farm inputs from local sources.
- (6) **Limited credit services:** Development of marketing requires financial/credit services for transactions. Loan and savings are needed to support lending for commercial uses to build capital for investment. High rates of interest of 10-20 percent, even for a short-term period, have been reported. The creation of agri-business is still limited due to lack of financial and

credit services, provided either by the government or other organizations. Credit availability for rice millers has not met their needs. Although there is some reluctance regarding borrowing capital, especially among the small rice millers, they do need working capital to finance their stock of paddy and for updating their rice milling machinery.

- (7) **Export issues:** From documentary review and personal interviews with traders and even government officers, it is known that export of most agricultural products is illegal and carried out with no tax, no records nor any controls. Many millers and wholesalers in Northwest Cambodia complain that export licenses are expensive and difficult to obtain. Moreover, the process entails completion of numerous forms, paperwork and additional payments. There are additional regulations that make legal export of produce unattractive. Thus the response of large millers and wholesalers is to sell to Thai and Vietnamese border traders, avoiding expensive and time consuming paper work.

To become successful on international rice markets, beyond border trading, the quality of Cambodian rice has to be improved. The quality of rice, from the millers' point of view, depends largely on the farmers' production techniques. An innovative overhaul calls for an for an effective rice program that includes variety improvement, good cultivation practices, appropriate post- harvest handling, effective agricultural extension, and also farmer training to raise yields and upgrade quality.

- (8) **Lack of marketing extension services:** It is not only agricultural extension that is needed to improve production of agricultural produce, but also marketing extension services are of equal importance. The Market Information Service (MIS) has been set up to provide price information to farmers as well as traders, even though the scope of information collection is only from a few Provinces and markets. However, a Market Extension Service (MES) is necessary to help farmers deal with trading their commodities.

In practise, the marketing extension officer will play the role of a farmers' business advisor. Farmers who want to make marketing strategies and production plans can discuss their needs. Finding out the requirements and preferences of the consumers will be a key strategy to successful marketing. As yet Cambodia has not had such a service. Therefore it is reasonable to propose that the MES established and implemented to assist farmers set up production and marketing systems should together with agricultural extension services.

A.1.6 Direction of Progress in the Agriculture Sector

The Royal Government of Cambodia has set policy goals and objectives for agriculture sector development in its Socio-Economic Development Plan (SEDP).

The agriculture sector in Cambodia contributes to 43 percent of GDP and provides direct employment to nearly 80 percent of the labor force. As 85 percent of the population lives in rural communities, and 75 percent of the poor are farmer-headed households, the key to sustained economic growth, poverty alleviation and development of the rural economy should, therefore, be through agriculture. However, the development of this sector is being constrained principally by low productivity and low quality of agricultural produce. These require a concerted effort to overcome its structural constraints. Nevertheless, sustained increase in productivity and quality are possible because there is a high potential to increase crop production by using high yielding crops, innovative production technology and possible capital for investment in both public and private sectors.

Recently, agriculture reforms have focused on removing state responsibility for production, to market-based agriculture. The government has an important role in ensuring that the positive impacts of a shift to a market driven agriculture sector are not at risk because of the lack of capacity of rural people to participate in the transition. The impact of reforms within the agriculture sector should have strong effects on the economy, and sector strategy needs to take into account the central importance of agriculture to employment, poverty reduction, and macro-economic stability.

(1) Policy Goals and Objectives

The government's policy goals and objectives for agriculture set out in the SEDP may be summarized as follows:

1. Improve food security through expansion and increase in rice production and other food crops.
2. Add value to crop and livestock production by developing agro-processing industries.
3. Increase income opportunities for farm households, particularly those headed by women, by diversifying crop production.
4. Strengthen the participation of rural communities.
5. Ensure sustainable agricultural production through improved management of natural resources.
6. Increase the availability of rural financial services.

(2) Policy Framework for Agriculture Sector Progress

There are 20 strategies in the policy framework for agriculture sector progress setup by the government. However, only six components relevant to crop improvement are discussed here, as follows.

1. **Basic strategy:** The government's strategy is geared towards promoting and strengthening competitive markets for the supply and distribution of good quality inputs. The government will continue to promote sector development by encouraging open access to domestic and international markets, as well as the provision of basic infrastructure such as rural roads, bridges, community water supply, flood control system, and other facilities to support the rural economy. The government will not intervene in the market except for regulation of standards, environment protection and management of emergency situations.
2. **Rural financing:** The severe lack of effective financial services in rural areas is one of the major constraints to agriculture growth and rural development. Micro finance operations of NGOs are almost the sole financial service, but their operations are limited to about only 11 percent of rural households. The government will, therefore, support expansion of rural credit and saving services by encouraging the participation of private licensed micro-finance institutions and commercial banks, and by strengthening the Rural Development Bank. In addition, the government will continue to monitor credit activities of NGOs and encourage the transformation of successful NGO credit providers into micro-finance institutions.
3. **Expanding extension services:** The expansion of agricultural extension services is a key component in the strategy to boost agricultural productivity. A new Department of Extension was recently established in MAFF with the assistance of AusAID. Extension services previously provided by separate technical departments are now being coordinated to meet the specific needs of farmers. In addition, there are 14 functioning research stations focusing mainly on rice. These institutions suffer from shortage of funds, lack of equipment and qualified personnel resulting in inadequate research and extension. With assistance from the World Bank several are being rehabilitated and their personnel trained in areas of variety improvement and applied research. The Government will seek further external assistance to ensure the continuance of farmer training in the areas of integrated pest management techniques and distribution of new varieties of high quality rice seed developed by the International Rice Research Institute.
4. **Further land reform:** In spite of the introduction of land reform in 1989, disputes over land are common. These conflicts arise from competitive possession claims, illegal land sales and forceful appropriation of land. In the medium term the Government will address this issue by enacting and implementing a revised land law, which will promote the resolution of land disputes and make provision for the changing value of land due to investment in infrastructure. The registration system envisaged will permit land to serve as collateral for rural credit and provide incentive for investment in land improvements.
5. **Boosting rice production:** Introduction of new seeds, production techniques and increased fertilizer use has contributed to recent sustained increases in rice output. Production of rice

accounts for nearly 90 percent of the available cultivated area, contributing an estimated 12.5 percent of GDP in 1998. Efforts to increase rice production are achieving success with production rising from two (2) million ton in 1995 to more than four (4) million ton in 2000. However, average yield is still 1.64 ton/ha comparing to 2.1 ton/ha in Thailand, 2.7 ton/ha in Philippines and 3.2 ton/ha in Viet Nam. Current efforts to accelerate the transfer of yield increasing technology and improve production practices and enhance management of soil and water resources will be maintained in order to achieve the target of an average yield of 2 ton/ha by 2003.

- 6. Strengthening input distribution:** Increase in access and better use of quality inputs is vital to increasing production of rice and other crops. At present fertilizer use by farmers is highly variable because it is often not available and the price is often prohibitive to them. This situation reflects lack of market information about the needs of farmers, which impede efficient distribution of fertilizer and other inputs. The considerable price differences between regions that cannot be explained by the cost of freight alone, reflect costs of illegal taxes and lack of competition among the traders. Thus, competition will be promoted by enforcement of legislation against illegal tax collectors. The issuing of an agricultural material law will provide legal standards for inputs including environment standards, and a monitoring and enforcement agency will be established to supervise its effectiveness.

A.2 Rice Balance

A.2.1 Province and District-wise Balance of Rice

(1) Province-wise Balance

By using recent, available data, namely the 1999/2000 agricultural statistics, a provincial/ regional trial balance analysis of rice was carried out. Following Cambodia's calculation standard, certain assumption were taken into account:

- (a) The aggregate rate of seed requirement, post harvest losses and livestock feed is assumed to be 17 percent of production. In the estimation of seed requirements, 100 kg per planted area is taken into account.
- (b) The conversion rate from paddy to rice is 62 percent.
- (c) The per capita demand for rice is 151.2 kg per year.

Table-1 summarizes the balance analysis by province in 1999/2000 (For other years, see Figure-2 and Table A.2 appended). The biggest surplus is in Takaev Province with about 160 thousand tons, followed by Prey Veang Province with 146 thousand tons, Svay Rieng with 61 thousand tons and Bat Dambang Province with 58 thousand tons. The most deficit is Phnom Penh Province with 153 thousand tons, followed by Kandal Province with 44 thousand tons and Kampong Cham Province with 19 thousand tons. Finally, Table-1 indicates an overall rice surplus of 260.7 thousand tons in Cambodia; this result is derived from the theoretical analysis with several assumptions. The preliminary analysis shows the tendency to increase the surplus year by year after 1995 when paddy production increased dramatically due to favorable climatic conditions. In addition, Table-1 does not include any provision for rice under so-called social safety nets such as the United Nations World Food Programme (WFP) activities.

On the other hand, considering the difficulty of access to the five (5) mountainous provinces of Preah Vihear, Stung Treng, Ratanak Kiri, Mondul Kiri and Kracheh, due to the poor condition of national and provincial roads, movement of rice from the surplus area to these provinces is not likely under the condition of market economy. This stems from an economic viewpoint, due to high transportation cost as well as these Provinces being thinly populated areas. This deficit of calorie intake from rice seems to be met by other cereals and root crops. In such a situation, the overall surplus might be increased to about 290 thousand tons.

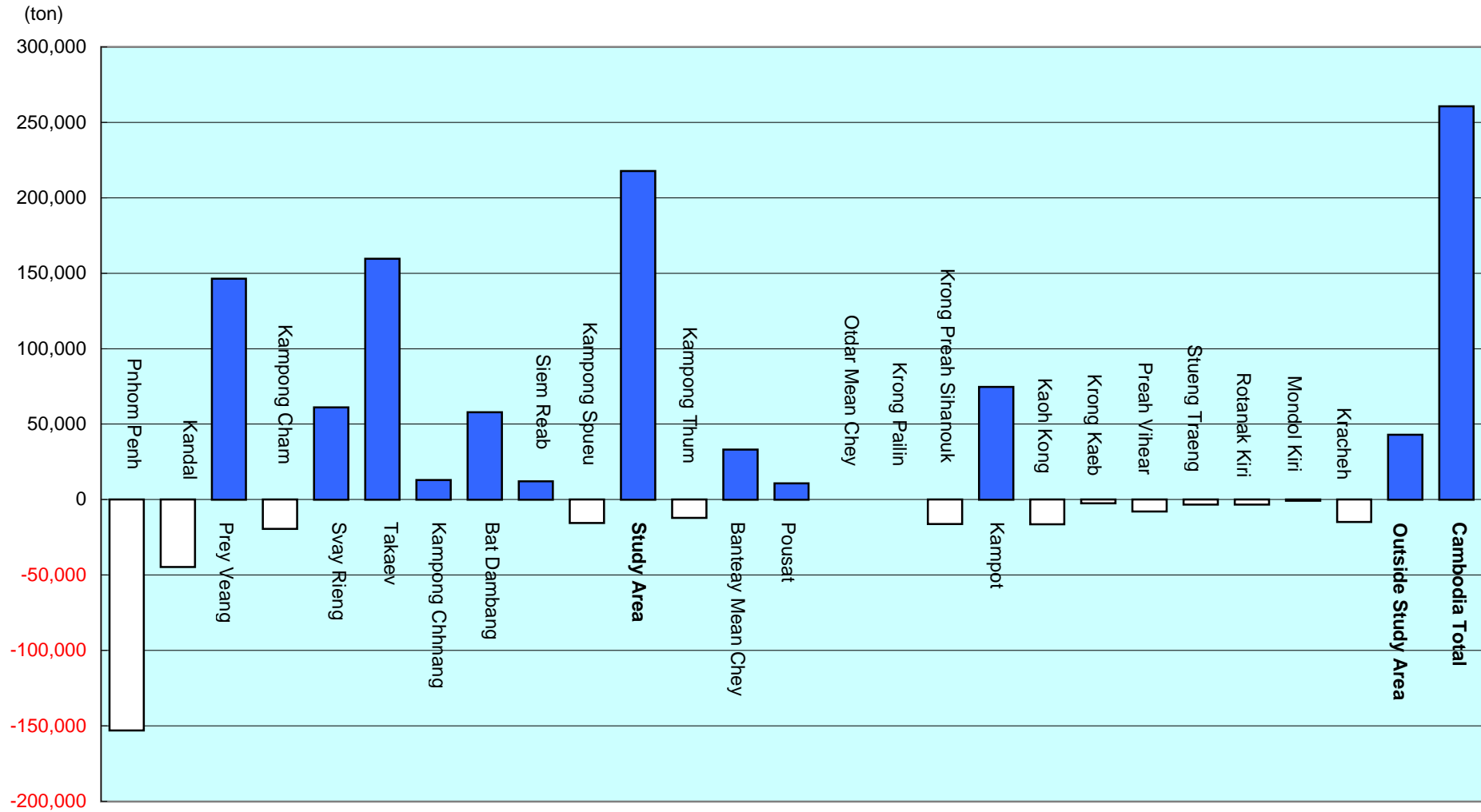
When the balance analysis is carried out on the basis of per capita supply and demand, Takaev Province has the highest potential to supply rice of 192 kg per population in the province, followed by Prey Veang 147 kg, Svay Rieng 121 kg, Kampot 134 kg and Bat Dambang 69 kg, each showing

Table-1 Province-wise Balance of Rice (1999/2000)

Province	Region	Supply of Rice							Demand of Rice			Balance	
		Paddy Production			Seed Req't	P.H. Loss	Availability		Population	Per capita Demand	Total Demand		
		Area (ha)	Yield	Production			Paddy	Rice					
1	Phnom Penh	Plain	8,730	1.39	12,110	873	1,186	10,051	6,232	1,052,743	0.1512	159,175	-152,943
2	Kandal	Plain	91,523	2.69	246,331	9,152	32,724	204,455	126,762	1,132,491	0.1512	171,233	-44,471
3	Prey Veang	Plain	300,308	1.92	577,380	30,031	68,124	479,225	297,120	996,985	0.1512	150,744	146,376
4	Kampong Cham	Plain	200,374	2.30	460,935	20,037	58,322	382,576	237,197	1,696,135	0.1512	256,456	-19,258
5	Svay Rieng	Plain	177,878	1.50	266,877	17,788	27,581	221,508	137,335	504,331	0.1512	76,255	61,080
6	Takaev	Plain	235,102	2.36	554,890	23,510	70,821	460,559	285,546	833,039	0.1512	125,955	159,591
7	Kampong Chhnang	Tonle S.	93,861	1.64	154,300	9,386	16,845	128,069	79,403	439,879	0.1512	66,510	12,893
8	Bat Dambang	Tonle S.	185,454	1.93	357,860	18,545	42,291	297,024	184,155	835,410	0.1512	126,314	57,841
9	Siem Reab	Tonle S.	192,930	1.35	260,404	19,293	24,976	216,135	134,004	805,888	0.1512	121,850	12,154
10	Kampong Spueu	Plt/Mt.	87,698	1.77	155,388	8,770	17,646	128,972	79,963	630,917	0.1512	95,395	-15,432
Sub-total (Study Area)			1,573,858	1.94	3,046,475	157,386	360,515	2,528,574	1,567,716	8,927,818	0.1512	1,349,886	217,830
11	Kampong Thum	Tonle S.	110,887	1.38	153,070	11,089	14,933	127,048	78,770	599,643	0.1512	90,666	-11,896
12	Banteay Mean Chey	Tonle S.	146,010	1.67	243,446	14,601	26,785	202,060	125,277	608,975	0.1512	92,077	33,200
13	Pousat	Tonle S.	76,514	1.73	132,650	7,651	14,899	110,100	68,262	380,060	0.1512	57,465	10,797
14	Otdar Mean Chey	Tonle S.	-	-	-	-	-	-	-	-	-	-	-
15	Krong Pailin	Tonle S.	-	-	-	-	-	-	-	-	-	-	-
16	Krong Preah Sihanouk	Coastal	9,523	1.78	16,940	952	1,928	14,060	8,717	163,901	0.1512	24,782	-16,065
17	Kampot	Coastal	138,390	2.23	308,795	13,839	38,656	256,300	158,906	556,869	0.1512	84,199	74,707
18	Kaoh Kong	Coastal	7,514	1.26	9,460	751	857	7,852	4,868	139,149	0.1512	21,039	-16,171
19	Krong Kaeb	Coastal	2,500	1.80	4,500	250	515	3,735	2,316	30,250	0.1512	4,574	-2,258
20	Preah Vihear	Plt/Mt.	17,425	1.26	21,986	1,743	1,995	18,248	11,314	125,698	0.1512	19,006	-7,692
21	Stueng Traeng	Plt/Mt.	17,110	1.10	18,852	1,711	1,494	15,647	9,701	85,421	0.1512	12,916	-3,214
22	Rotanak Kiri	Plt/Mt.	18,822	1.22	22,905	1,882	2,012	19,011	11,787	99,356	0.1512	15,023	-3,236
23	Mondol Kiri	Plt/Mt.	7,602	1.18	8,960	760	763	7,437	4,611	34,169	0.1512	5,166	-556
24	Kracheh	Plt/Mt.	31,437	1.68	52,861	3,144	5,843	43,875	27,202	277,372	0.1512	41,939	-14,736
Sub-total (Non Study Area)			583,734	1.70	994,425	58,373	110,679	825,373	511,731	3,100,863	0.1512	468,850	42,881
Total			2,157,592	1.87	4,040,900	215,759	471,194	3,353,947	2,079,447	12,028,681		1,818,737	260,711

Note: Paddy production area is based on not harvested area but planted area. Post-harvest loss includes feed for animals.

Figure-2 Province-wise Balance of Rice (1999/2000)



the same tendency in total surplus. The largest deficit is seen in Phnom Penh Province with 145 kg per person close to the target requirement of 151.2 kg, followed by Kaoh Kong 116 kg, Krong Preah Sihanouk 98 kg and Krong Kaeb 75 kg. The two provinces of Otdar Mean Chey and Krong Pailin show no data on paddy production due to its recent creation after ending political conflict with Pol Pot.

On the basis of crop calendar provided by the provincial department of agriculture and other agencies concerned within the Study area as well as crop production data presented in the agricultural statistics of Cambodia, monthly balance of rice in the respective province is simulated. In the simulation analysis, information on a cropping calendar is given by the provincial department of agriculture, harvested area and production of paddy by WFP commune database, and percentage of harvested area by Department of Agronomy in MAFF. Figure-3 shows monthly balance of rice and cumulative balance starting from January for year 1999/2000. It is also remarked that when the starting point is selected at the different month, the pattern of cumulative balance varies accordingly. In Figure-1, although several provinces such as Bat Dambang, Kampong Chhnang, Ssiem Reab which have a surplus at the end of year, are facing a cumulative deficit in the several months. Only three provinces of Prey Veang, Svay Rieng and Takaev are keeping a cumulative surplus throughout a year. Details of simulation analysis is given in Table A.3 appended.

(2) District-wise Balance

On the basis of the 1999/2000 agricultural statistics by MAFF and the 1999 WFP commune database, a district-wise rice balance study was carried out for the 10 provinces which compose the Study area with the same assumption adopted in the provincial rice balance analysis as mentioned in the above.

Table-2 summarizes results of the district-wise balance indicating overall surplus of about 218 thousand tons or 24 Kg per person in the Study area. Out of 102 districts in the Study area, while 56 districts have an aggregate surplus of about 574 thousand tons with equivalent to 123 Kg per person, 46 districts faces total deficit of about 356 thousand tons or 84 Kg per person. In only Takaev province, which produces total surplus of 160 thousand tons, every district has a certain surplus of rice, on the contrary, in Phnom Penh province every district faces deficit with total deficit of about 153 thousand tons (See Table A.4 appended).

It is remarkable that even in the big rice surplus province of Bat Dambang, six (6) districts are facing deficit condition with total amount of 32 thousand tons or 121 Kg per person. Furthermore, it is easily supposed that even in the rice surplus district, there exist certainly a rice deficit commune, for which World Food Program (WFP) is providing its food-aid when WFP identifies such commune as chronically food shortage one.

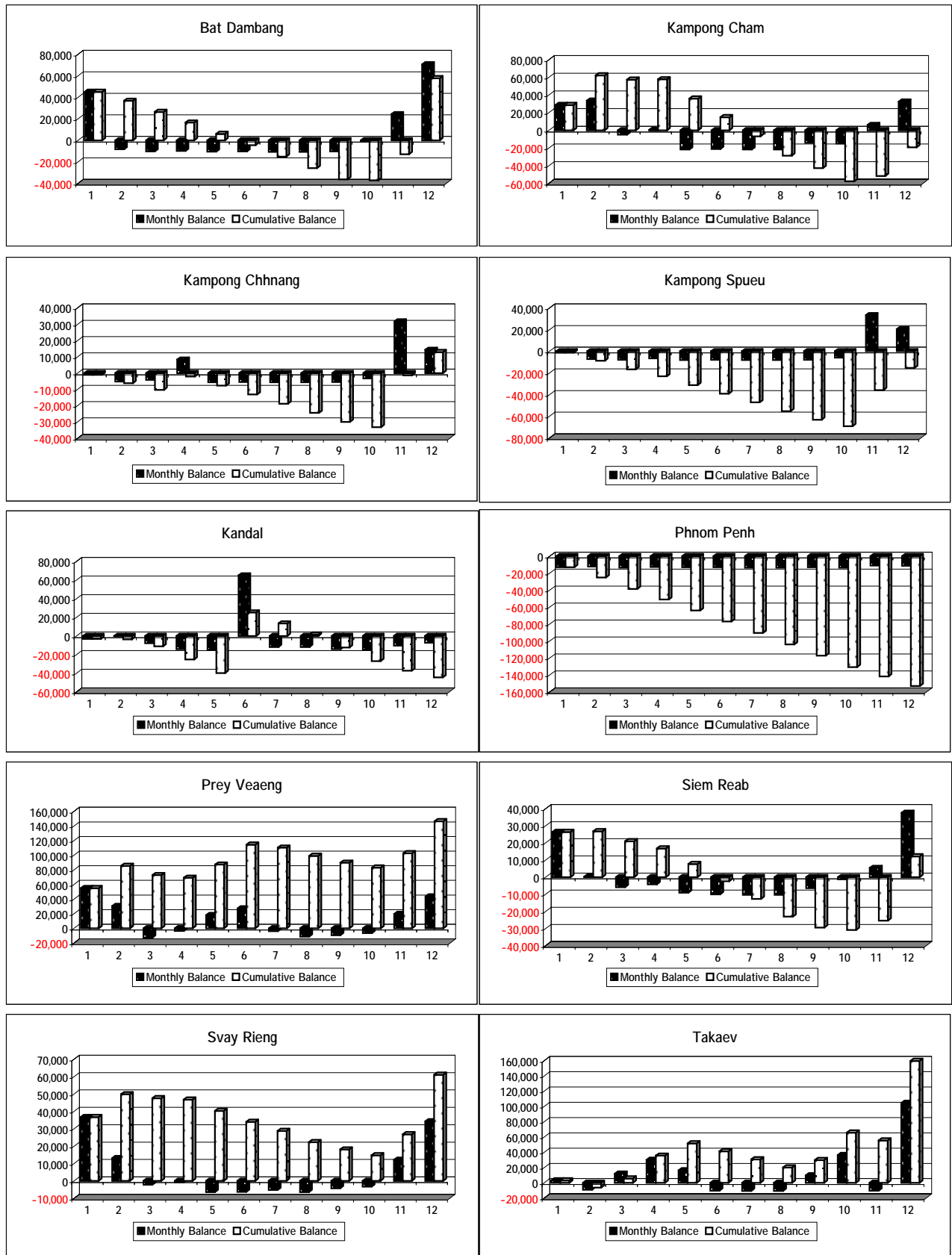


Figure-3 Monthly Balance of Rice (ton) - 1999/2000

Table-2 Summary of District-wise Rice Balance Study

	Unit	Phnom Penh	Kandal	Prey Veang	Kampong Cham	Svay Rieng	Takaev	Kampong Chhnang	Bat Dambang	Siem Reab	Kampong Spueu	Total
1. Provincial Total												
1.1 No. of District	nos.	7	11	12	16	7	10	8	11	12	8	102
1.2 Total Population	nos.	1,052,743	1,132,491	996,985	1,696,135	504,331	833,039	439,879	835,410	805,888	630,917	8,927,818
1.3 Surplus/Deficit												
- Total volume	ton	-152,943	-44,471	146,376	-19,258	61,080	159,591	12,893	57,841	12,154	-15,432	217,831
- Per capita	kg	-145.3	-39.3	146.8	-11.4	121.2	191.6	29.3	69.2	15.1	-24.5	24.4
2. District-wise												
2.1 Surplus												
- No. of District	nos.	-	2	9	8	6	10	5	5	9	2	56
- Population	nos.	-	136,436	802,022	774,607	481,970	833,039	326,793	573,970	609,616	130,966	4,669,419
- Total volume	ton	-	3,530	160,189	43,605	63,115	159,591	20,274	89,395	30,852	3,615	574,166
- Per capita	kg	-	25.9	199.7	56.3	131.0	191.6	62.0	155.7	50.6	28	123.0
2.2 Deficit												
- No. of District	nos.	7	9	3	8	1	-	3	6	3	6	46
- Population	nos.	1,052,743	996,055	194,963	921,528	22,361	-	113,086	261,440	196,272	499,951	4,258,399
- Total volume	ton	-152,943	-48,000	-13,814	-62,864	-2,035	-	-7,381	-31,554	-18,698	-19,047	-356,336
- Per capita	kg	-145.3	-48.2	-70.9	-68.2	-91.0	-	-65.3	-120.7	-95.3	-38.1	-83.7
3. Maximum Surplus												
3.1 Volume-wise												
- District Name	-	-	Kandal Stue.	Kp. Trabaek	Batheay	Svay Chrum	Treang	Rolea B'ier	Moung Rus.	Chi Kraeng	Basedth	-
- Population	nos.	-	80,633	112,293	95,849	136,639	103,724	85,443	141,542	123,548	114,460	-
- Volume	ton	-	3,322	31,743	16,937	20,072	24,060	8,021	35,210	10,686	2,138	-
3.2 Density-wise												
- District Name	-	-	Kandal Stue.	Kanhcherieh	Batheay	Kp. Rou	Bourei Cho.	Baribour	Moung Rus.	Kralanh	Aoral	-
- Population	nos.	-	80,633	59,053	95,849	64,849	25,787	54,253	141,542	65,886	16,506	-
- Per capita	kg	-	41.2	325.3	176.7	285.9	926.2	54.8	248.8	120.0	89.5	-
4. Maximum Deficit												
4.1 Volume-wise												
- District Name	-	Chamkar M.	Kien Svay	Peam Ro	Tboung K.	Svay Rieng	-	Kp. Chhnang	Bat Dambang	Siem Reab	Kong Pisei	-
- Population	nos.	196,988	156,274	113,771	226,423	22,361	-	43,918	1,233,019	138,367	102,195	-
- Volume	ton	-29,785	-13,602	-8,657	-15,668	-2,035	-	-5,816	-14,583	-15,998	-5,877	-
4.2 Density-wise												
- District Name	-	Chamkar M.	Ta Khmau	Peam Ro	Kp. Cham	Svay Rieng	-	Kp. Chhnang	Phnum Pro.	Siem Reab	Kong Pisei	-
- Population	nos.	196,988	61,373	113,771	47,813	22,361	-	43,918	16,173	138,367	102,195	-
- Per capita	kg	-151.2	-137.8	-129.3	-149.4	-91.0	-	-132.4	-151.2	-115.6	-57.5	-

Moung Russei district of Bat Dambang province produces maximum surplus amount of 35.2 thousand tons followed by Kampong Trabaek district of Prey Veang province with 32 thousand tons. In the deficit side, Chamkar Mon district of Phnom Penh province faces 30 thousand tons deficit followed by Siem Reab district of Siem Reab province with 16 thousand tons. On the other hand, Bourei Cholsar district of Takaev province provides maximum surplus density of 926 Kg per person (with district population of 25,787) followed by 325 Kg in Kanhchriech district of Prey Veang province, while Chamkar Mon district and several other districts in Phnom Penh province where no paddy production takes place, face a deficit of 151.2 Kg per person.

A.2.2 Food Aid by World Food Programme (WFP)

(1) Overview

For information on WFP activity in Cambodia, reference is made to the Web Site Home Page of WFP and quote:

WFP has been present in Cambodia since 1979, when the program provided primarily relief assistance. Recently, WFP has shifted its focus in Cambodia to recovery and rehabilitation activities. The broad goals of WFP's assistance are to increase sustained food security among the hungry poor, and at the same time support communities' efforts to create their own self-sufficiency.

Specific objectives include:

- Building and rehabilitating essential assets, facilitate reconciliation and promote self-reliance among the poor;
- Contributing to improve the quality of life; and
- Providing immediate relief from hunger among specific groups temporarily unable to meet their basic food needs.

(2) Previous Assistance

Continuously present in Cambodia since 1979 for emergency relief, WFP assistance moved to a Protracted Relief Operation from 1994, under PRO 5483.00 and expansions, which terminated in 1998. Under this project, WFP, on average, distributed over 47,000 tons of cereals per year (in addition to fish, oil and salt). Under the current Protracted Relief and Recovery Operation, PRRO 6038, Food Aid for Recovery and Rehabilitation in Cambodia (1999-2000), WFP is committed to reaching over one million beneficiaries each year primarily through food-for-work activities in targeted food-insecure communes throughout the country.

The current PRRO targets four major groups of beneficiaries: poor residents of chronically food insecure communes; Protracted Emergency Target area populations (resettled IDPs, former

combatants, returning refugees); Social Sector beneficiaries (female literacy and birth spacing trainers, skills training students, amputees in prosthetics treatment, TB patients, street children, orphans, other vulnerable groups); and short-term emergency-affected populations. However, the PRRO does not directly address the underlying problems of chronic malnutrition among vulnerable groups. Hence, this QAP (Quick Action Project) is intended to specifically target these groups, test different methods to reach them and guide future development interventions.

The following Table-3 shows number of districts covered by WFP assistance with the distributed amount of rice by province:

Table-3 Distribution of Rice by WFP

(District in number, Amount in ton)

Name of Province	Total No. of District	1997		1998		1999	
		District	Amount	District	Amount	District	Amount
Phnom Penh	7	7	444	7	453	7	719
Kandal	11	11	913	11	855	11	697
Prey Veang	12	11	988	12	3,270	11	2,957
Kampong Cham	16	15	3,806	15	4,352	16	3,228
Svay Rieng	7	7	723	7	804	7	655
Takev	10	10	739	7	1,106	7	1,225
Kampong Chhnang	8	8	514	8	1,122	8	1,241
Bat Dambang	12	8	5,218	8	3,416	11	3,095
Siem Reab	12	11	2,233	12	2,431	12	2,423
Kampong Spueu	12	8	1,480	8	2,682	8	2,605
Sub-total (Study Area)	107	96	17,058	95	20,491	98	18,845
Kampong Thum	8	8	4,227	8	2,830	7	2,773
Banteay Mean Chey	8	8	2,158	8	2,272	8	1,612
Pousat	6	5	1,259	5	630	5	891
Otdar Mean Chey	4	2	225	2	338	3	585
Krong Pailin	2	-	-	-	-	1	18
Krong Preah Sihanouk	3	3	64	3	55	3	57
Kampot	8	7	2,310	8	1,392	8	971
Kaoh Kong	8	-	-	1	50	-	-
Krong Kaeb	2	1	3	2	24	2	36
Preah Vihear	7	4	716	5	513	5	456
Stueng Traeng	5	4	114	4	126	5	175
Rotanak Kiri	9	-	-	-	-	8	86
Mondol Kiri	5	-	-	1	3	5	722
Kracheh	5	5	118	5	105	5	246
S-total (Non Study Area)	80	47	11,194	52	8,338	65	8,628
Total (Cambodia)	187	143	28,252	147	28,829	163	27,473

(Data Source: WFP Cambodia)

As seen in the above table, number of districts covered is increasing to about 87%. It is also remarkable that even the rice surplus districts given in Table-2, are included as deficit districts targeted by WFP. In 1999, Kampong Cham Province received the biggest food-aid of 3,228 tons followed by Bat Dambang 3,095 tons, Prey Veang 2,957 tons and Kampong Thum 2,773 tons. WFP has started to distribute to the mountainous provinces with the partnership of other international cooperation agencies.

Appendix A : Agricultural Production and Rice Balance

Tables and Figures

Table A.1	Paddy Production (Crop Year 1999/2000 – 1995/96)
Table A.2	Province-wise Balance of Rice (1998/99 – 1996/97)
Table A.3	Monthly Balance of Rice by Province
Table A.4	District-wise Balance of Rice (1999/2000)
Fig. A.1	WFP Targeted Communes - 2000

Table A.1 (1/10) Paddy Production

Crop Year 1999/2000

Province	Wet Season Rice 1999/2000													
	Cultivated Area (ha)							Destroyed Area (ha)					Damaged Area	
	Early Rice		Medium	Upland	Late	Floating	Total	Flood	Mouse	Drought	Insect	Total	Flood	Mouse
	Total	(IR)												
12 Phnom Penh	580	580	5,168	0	1,782	0	7,530	2,134	0	0	0	2,134	0	0
08 Kandal	12,556	10,454	11,760	441	16,661	3,725	45,143	1,869	165	435	0	2,469	0	0
04 Kampong Cham	34,398	5,891	53,538	9,119	70,329	990	168,374	1,063	50	0	18	1,131	0	0
20 Svay Rieng	14,300	3,200	117,407	53	36,118	0	167,878	2,465	80	1,815	1,200	5,560	0	0
14 Prey Veaeng	40,133	21,870	111,611	0	89,095	469	241,308	353	63	450	217	1,083	0	0
21 Takeav	74,095	16,435	84,477	0	15,021	2,509	176,102	1,147	660	1,164	0	2,971	0	0
06 Kampong Thum	17,793	3,079	35,789	2,915	35,500	16,890	108,887	6,536	173	1,914	1,100	9,723	0	0
17 Siem Reab	39,345	815	66,725	6,790	64,145	5,625	182,630	1,150	0	320	80	1,550	0	0
02 Bat Dambang	23,023	1,376	49,827	3,088	103,596	4,620	184,154	10,099	0	470	5,014	15,583	0	0
01 Banteay Mean Chey	19,056	275	53,671	0	58,635	14,338	145,700	4,300	0	1,100	100	5,500	0	0
15 Pousat	16,019	232	28,394	0	27,188	4,803	76,404	4,454	0	0	0	4,454	0	0
04 Kampong Chhnang	21,546	885	43,830	270	15,816	2,099	83,561	495	0	0	0	495	0	0
18 Krong Preah Sihanouk	710	0	6,496	0	2,317	0	9,523	23	0	0	0	23	0	0
23 Krong Kaeb	550	60	600	0	1,350	0	2,500	30	0	10	10	50	0	0
07 Kampot	17,270	11,792	96,345	1,327	20,495	453	135,890	2,783	0	0	0	2,783	0	0
09 Kaoh Kong	1,200	150	2,276	3,038	1,000	0	7,514	242	0	0	0	242	0	0
05 Kampong Spueu	24,167	1,180	45,615	1,154	15,662	0	86,598	1,756	0	539	0	2,295	0	0
13 Preah Vihear	3,900	1,500	5,700	2,000	5,825	0	17,425	477	0	37	0	514	0	0
19 Stueng Traeng	4,462	850	5,190	2,193	5,217	48	17,110	2,779	0	865	0	3,644	0	0
16 Roranak Kiri	1,550	300	2,500	12,372	2,400	0	18,822	1,089	0	0	115	1,204	0	0
11 Modol Kiri	1,050	1,050	1,202	2,150	3,200	0	7,602	887	0	0	535	1,422	0	0
10 Kracheh	3,850	368	10,116	1,228	9,743	0	24,937	4,302	5	0	13	4,320	0	0
22 Otdar Mean Chey	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
24 Krong Pailin	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Sub-total (Study area)	284,143	62,686	589,958	20,915	428,225	20,037	1,343,278	22,531	1,018	5,193	6,529	35,271	0	0
Total	371,553	82,342	838,237	48,138	601,095	56,569	1,915,592	50,433	1,196	9,119	8,402	69,150	0	0

Legend: = Study Area
 Source: Agricultural Statistics, 1999/2000
 Department of Planning and Statistics, MAFF

Table A.1 (2/10) Paddy Production

Crop Year 1999/2000 (cont'd)

Province	Damaged Area (ha)			Harvested Area (ha)	Yield (t/ha)	Production (ton)	Dry Season Rice 1999/2000					Total 1999/2000		
	Drought	Insect	Total				Cultivated Area (ha)	Destroyed Area (ha)	Harvested Area (ha)	Yield (t/ha)	Production (ton)	Harvested Area (ha)	Yield (t/ha)	Production (ton)
12 Phnom Penh	0	0	0	5,396	1.80	9,710	1,200	0	1,200	2.00	2,400	6,596	1.84	12,110
08 Kandal	0	0	0	42,674	2.17	92,646	46,380	1,380	45,000	3.42	153,685	87,674	2.81	246,331
04 Kampong Cham	0	0	0	167,243	2.20	367,935	32,000	2,000	30,000	3.10	93,000	197,243	2.34	460,935
20 Svay Rieng	0	0	0	162,318	1.50	243,477	10,000	1,000	9,000	2.60	23,400	171,318	1.56	266,877
14 Prey Veaeng	0	0	0	240,225	1.69	406,380	59,000	2,000	57,000	3.00	171,000	297,225	1.94	577,380
21 Takeav	0	0	0	173,131	2.20	380,890	59,000	1,000	58,000	3.00	174,000	231,131	2.40	554,890
06 Kampong Thum	0	0	0	99,164	1.50	148,750	2,000	200	1,800	2.40	4,320	100,964	1.52	153,070
17 Siem Reab	0	0	0	181,080	1.30	235,404	10,300	300	10,000	2.50	25,000	191,080	1.36	260,404
02 Bat Dambang	0	0	0	168,571	2.11	355,700	1,300	100	1,200	1.80	2,160	169,771	2.11	357,860
01 Banteay Mean Chey	0	0	0	140,200	1.73	242,546	310	10	300	3.00	900	140,500	1.73	243,446
15 Pousat	0	0	0	71,950	1.84	132,390	110	10	100	2.60	260	72,050	1.84	132,650
04 Kampong Chhnang	0	0	0	83,066	1.50	124,600	10,300	400	9,900	3.00	29,700	92,966	1.66	154,300
18 Krong Preah Sihanouk	0	0	0	9,500	1.78	16,940	0	0	0	-	0	9,500	1.78	16,940
23 Krong Kaeb	0	0	0	2,450	1.84	4,500	0	0	0	-	0	2,450	1.84	4,500
07 Kampot	0	0	0	133,107	2.26	300,820	2,500	0	2,500	3.19	7,975	135,607	2.28	308,795
09 Kaoh Kong	0	0	0	7,272	1.30	9,460	0	0	0	-	0	7,272	1.30	9,460
05 Kampong Spueu	0	0	0	84,303	1.81	152,588	1,100	100	1,000	2.80	2,800	85,303	1.82	155,388
13 Preah Vihear	0	0	0	16,911	1.30	21,986	0	0	0	-	0	16,911	1.30	21,986
19 Stueng Traeng	0	0	0	13,466	1.40	18,852	0	0	0	-	0	13,466	1.40	18,852
16 Roranak Kiri	0	0	0	17,618	1.30	22,905	0	0	0	-	0	17,618	1.30	22,905
11 Modol Kiri	0	0	0	6,180	1.45	8,960	0	0	0	-	0	6,180	1.45	8,960
10 Kracheh	0	0	0	20,617	1.72	35,461	6,500	500	6,000	2.90	17,400	26,617	1.99	52,861
22 Otdar Mean Chey	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
24 Krong Pailin	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Sub-total (Study area)	0	0	0	1,308,007	1.81	2,369,330	230,580	8,280	222,300	3.05	677,145	1,530,307	1.99	3,046,475
Total	0	0	0	1,846,442	1.81	3,332,900	242,000	9,000	233,000	3.04	708,000	2,079,442	1.94	4,040,900

Table A.1 (3/10) Paddy Production

Crop Year 1998/1999

Province	Wet Season Rice 1998/1999													
	Cultivated Area (ha)							Destroyed Area (ha)					Damaged Area	
	Early Rice		Medium	Upland	Late	Floating	Total	Flood	Mouse	Drought	Insect	Total	Flood	Mouse
	Total	(IR)												
12 Phnom Penh	830	747	4,650	0	2,500	0	7,980	0	0	1,580	0	1,580	0	0
08 Kandal	9,510	8,085	14,290	700	15,800	3,850	44,150	950	0	0	1,000	1,950	2,070	0
04 Kampong Cham	29,372	20,560	42,893	6,940	80,242	1,053	160,500	0	30	190	180	400	0	50
20 Svay Rieng	17,759	15,095	91,502	246	45,281	12	154,800	1,700	100	3,200	400	5,400	1,800	150
14 Prey Veaeng	39,139	33,170	92,960	0	71,715	298	204,112	500	80	262	1,470	2,312	5,800	100
21 Takeav	66,359	58,840	79,918	0	21,585	2,786	170,648	0	0	8,648	0	8,648	0	0
06 Kampong Thum	18,225	910	36,551	3,040	35,617	28,269	121,702	1,021	1,050	7,839	1,592	11,502	1,030	1,060
17 Siem Reab	36,155	21,693	52,500	8,185	79,515	5,645	182,000	0	50	850	300	1,200	0	70
02 Bat Dambang	20,600	11,160	56,900	1,573	108,852	14,108	202,033	2,500	0	30,233	600	33,333	2,650	0
01 Banteay Mean Chey	30,285	0	51,150	0	57,135	18,930	157,500	15,500	0	14,400	2,900	32,800	15,600	0
15 Pousat	14,968	8,980	26,873	0	26,690	8,616	77,147	0	0	6,647	0	6,647	0	0
04 Kampong Chhnang	25,630	15,318	37,539	192	15,622	731	79,714	150	0	184	80	414	265	0
18 Krong Preah Sihanouk	795	50	6,255	0	2,595	0	9,645	130	0	0	36	166	150	0
23 Krong Kaeb	600	0	800	0	1,194	0	2,594	0	0	0	0	0	0	0
07 Kampot	2,930	1,680	101,300	2,420	23,500	385	130,535	0	0	13,635	0	13,635	0	0
09 Kaoh Kong	400	50	1,500	2,444	2,771	0	7,115	0	0	0	0	0	0	0
05 Kampong Spueu	22,050	15,120	45,335	1,725	14,535	0	83,645	0	0	0	45	45	100	0
13 Preah Vihear	2,000	50	3,603	997	8,400	0	15,000	854	0	166	0	1,020	1,000	0
19 Stueng Traeng	4,462	0	4,540	2,260	4,700	38	16,000	0	0	194	679	873	0	0
16 Roranak Kiri	1,500	0	1,673	11,096	3,154	0	17,423	0	0	542	533	1,075	0	0
11 Modol Kiri	1,200	0	1,300	1,000	1,500	0	5,000	0	0	222	525	747	0	0
10 Kracheh	3,100	200	7,000	500	13,250	0	23,850	15	0	3,935	0	3,950	30	0
22 Otdar Mean Chey	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
24 Krong Pailin	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Sub-total (Study area)	267,404	199,788	518,487	19,561	455,647	28,483	1,289,582	5,800	260	45,147	4,075	55,282	12,685	370
Total	347,869	211,708	761,032	43,318	636,153	84,721	1,873,093	23,320	1,310	92,727	10,340	127,697	30,495	1,430

Legend: = Study Area
 Source: Agricultural Statistics, 1998/99
 Department of Planning and Statistics, MAFF

Table A.1 (4/10) Paddy Production

Crop Year 1998/1999 (cont'd)

Province	Damaged Area (ha)			Harvested Area (ha)	Yield (t/ha)	Production (ton)	Dry Season Rice 1998/1999					Total 1998/1999		
	Drought	Insect	Total				Cultivated Area (ha)	Destroyed Area (ha)	Harvested Area (ha)	Yield (t/ha)	Production (ton)	Harvested Area (ha)	Yield (t/ha)	Production (ton)
12 Phnom Penh	222	0	222	6,400	2.00	12,800	1,073	100	973	2.56	2,490	7,373	2.07	15,290
08 Kandal	2,325	1,105	5,500	42,200	1.92	81,200	44,200	200	44,000	3.40	149,600	86,200	2.68	230,800
04 Kampong Cham	12,138	330	12,518	160,100	2.23	357,300	28,377	600	27,777	2.93	81,300	187,877	2.33	438,600
20 Svay Rieng	11,616	700	14,266	149,400	1.04	155,300	9,000	900	8,100	2.52	20,400	157,500	1.12	175,700
14 Prey Veang	60,986	1,750	68,636	201,800	1.41	285,400	57,673	8,682	48,991	2.87	140,545	250,791	1.70	425,945
21 Takeav	9,668	0	9,668	162,000	1.73	280,300	58,325	1,000	57,325	2.85	163,380	219,325	2.02	443,680
06 Kampong Thum	8,258	1,600	11,948	110,200	1.83	201,800	1,750	250	1,500	2.10	3,150	111,700	1.83	204,950
17 Siem Reab	20,540	500	21,110	180,800	1.27	229,200	10,175	300	9,875	2.34	23,110	190,675	1.32	252,310
02 Bat Dambang	117,274	670	120,594	168,700	1.99	335,000	1,300	100	1,200	1.65	1,980	169,900	1.98	336,980
01 Banteay Mean Chey	43,150	4,000	62,750	124,700	1.92	239,900	300	10	290	3.00	870	124,990	1.93	240,770
15 Pousat	20,128	0	20,128	70,500	1.76	124,400	100	0	100	2.40	240	70,600	1.77	124,640
04 Kampong Chhnang	10,704	90	11,059	79,300	1.74	137,700	10,199	1,000	9,199	3.00	27,600	88,499	1.87	165,300
18 Krong Preah Sihanouk	1,672	50	1,872	9,479	1.60	15,166	0	0	0	-	0	9,479	1.60	15,166
23 Krong Kaeb	0	0	0	2,594	1.46	3,787	0	0	0	-	0	2,594	1.46	3,787
07 Kampot	14,260	0	14,260	116,900	1.62	189,800	1,000	0	1,000	2.50	2,500	117,900	1.63	192,300
09 Kaoh Kong	2,644	0	2,644	7,115	1.26	8,965	0	0	0	-	0	7,115	1.26	8,965
05 Kampong Spueu	14,900	100	15,100	83,600	1.40	117,300	990	150	840	2.62	2,200	84,440	1.42	119,500
13 Preah Vihear	2,303	0	3,303	13,980	1.30	18,174	0	0	0	-	0	13,980	1.30	18,174
19 Stueng Traeng	9,480	700	10,180	15,127	1.28	19,363	0	0	0	-	0	15,127	1.28	19,363
16 Roranak Kiri	560	540	1,100	16,348	1.25	20,435	0	0	0	-	0	16,348	1.25	20,435
11 Modol Kiri	1,005	700	1,705	4,253	1.25	5,316	0	0	0	-	0	4,253	1.25	5,316
10 Kracheh	4,210	0	4,240	19,900	1.77	35,300	6,458	458	6,000	2.77	16,600	25,900	2.00	51,900
22 Otdar Mean Chey	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
24 Krong Pailin	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Sub-total (Study area)	260,373	5,245	278,673	1,234,300	1.61	1,991,500	221,312	13,032	208,280	2.94	612,605	1,442,580	1.81	2,604,105
Total	368,043	12,835	412,803	1,745,396	1.65	2,873,906	230,920	13,750	217,170	2.93	635,965	1,962,566	1.79	3,509,871

Table A.1 (5/10) Paddy Production

Crop Year 1997/1998

Province	Wet Season Rice 1997/1998													
	Cultivated Area (ha)							Destroyed Area (ha)					Damaged Area	
	Early Rice		Medium	Upland	Late	Floating	Total	Flood	Mouse	Drought	Insect	Total	Flood	Mouse
	Total	(IR)												
12 Phnom Penh	660	210	4,763	0	2,422	0	7,845	0	0	76	80	156	20	0
08 Kandal	7,966	5,830	14,417	735	15,708	4,065	42,891	4,343	0	525	0	4,868	4,975	0
04 Kampong Cham	32,368	6,023	36,312	7,421	69,695	1,141	146,937	2,837	0	180	100	3,117	10,069	0
20 Svay Rieng	27,274	18,500	61,075	69	63,255	8	151,681	0	0	727	65	792	12	0
14 Prey Veaeng	33,873	29,962	71,075	0	72,466	93	177,507	1,241	0	15,790	0	17,031	38,376	0
21 Takeav	65,789	11,800	77,870	0	20,129	6,860	170,648	5,745	0	2,835	39	8,619	6,592	0
06 Kampong Thum	20,960	1,500	41,085	2,966	33,837	28,653	127,501	6,338	0	1,967	943	9,248	6,338	0
17 Siem Reab	34,955	1,500	64,485	7,715	66,685	4,980	178,820	7,970	0	0	675	8,645	7,970	0
02 Bat Dambang	17,069	516	36,806	236	125,121	13,833	193,065	2,352	0	53,070	1,000	56,422	6,352	0
01 Banteay Mean Chey	14,297	0	35,295	0	81,250	18,408	149,250	0	0	20,000	0	20,000	32,000	0
15 Pousat	15,750	800	25,995	0	28,996	5,287	76,028	1,500	0	0	0	1,500	1,500	0
04 Kampong Chhnang	22,050	1,100	36,500	195	24,500	865	84,110	386	0	0	97	483	386	0
18 Krong Preah Sihanouk	820	80	6,720	0	1,910	0	9,450	0	0	0	1,700	1,700	103	0
23 Krong Kaeb	405	25	771	0	1,418	0	2,594	0	0	0	0	0	0	0
07 Kampot	3,722	3,103	116,725	2,017	13,619	417	136,500	0	0	0	0	0	0	0
09 Kaoh Kong	1,000	50	1,100	2,278	2,962	0	7,340	0	0	0	0	0	0	0
05 Kampong Spueu	20,103	725	45,799	1,053	14,969	7	81,931	138	0	2,425	0	2,563	138	0
13 Preah Vihear	2,500	300	5,000	2,500	5,755	0	15,755	0	0	0	0	0	0	0
19 Stueng Traeng	3,170	200	3,795	2,351	4,900	46	14,262	4,948	0	172	229	5,349	4,948	0
16 Roranak Kiri	3,658	100	5,935	1,000	9,290	0	19,883	225	0	719	0	944	261	0
11 Modol Kiri	1,100	300	1,200	2,395	1,490	0	6,185	0	0	0	0	0	1,500	0
10 Kracheh	3,600	124	13,600	632	9,313	0	27,145	985	0	0	0	985	985	0
22 Otdar Mean Chey	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
24 Krong Pailin	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Sub-total (Study area)	262,107	76,166	449,102	17,424	474,950	31,852	1,235,435	25,012	0	75,628	2,056	102,696	74,890	0
Total	333,089	82,748	706,323	33,563	669,690	84,663	1,827,328	39,008	0	98,486	4,928	142,422	122,525	0

Legend: = Study Area
 Source: Agricultural Statistics, 1997/98
 Department of Planning and Statistics, MAFF

Table A.1 (6/10) Paddy Production

Crop Year 1997/1998 (cont'd)

Province	Damaged Area (ha)			Harvested Area (ha)	Yield (t/ha)	Production (ton)	Dry Season Rice 1997/1998					Total 1997/1998		
	Drought	Insect	Total				Cultivated Area (ha)	Destroyed Area (ha)	Harvested Area (ha)	Yield (t/ha)	Production (ton)	Harvested Area (ha)	Yield (t/ha)	Production (ton)
12 Phnom Penh	122	80	222	7,689	1.70	13,071	1,200	50	1,150	2.50	2,875	8,839	1.80	15,946
08 Kandal	525	0	5,500	38,023	1.85	70,343	46,000	1,000	45,000	3.19	143,530	83,023	2.58	213,873
04 Kampong Cham	2,271	178	12,518	143,820	1.67	240,179	30,000	800	29,200	2.97	86,694	173,020	1.89	326,873
20 Svay Rieng	12,238	2,016	14,266	150,889	1.19	179,558	12,000	40	11,960	2.71	32,445	162,849	1.30	212,003
14 Prey Veang	28,564	1,646	68,586	160,476	1.45	232,690	60,145	1,130	59,015	3.43	202,370	219,491	1.98	435,060
21 Takeav	2,835	113	9,540	162,029	2.50	405,073	61,000	900	60,100	3.00	180,487	222,129	2.64	585,560
06 Kampong Thum	1,144	1,766	9,248	118,253	1.15	135,991	3,498	200	3,298	2.16	7,113	121,551	1.18	143,104
17 Siem Reab	12,465	675	21,110	170,175	1.21	205,912	10,000	300	9,700	3.00	29,100	179,875	1.31	235,012
02 Bat Dambang	113,242	0	119,594	136,643	1.61	219,995	2,640	0	2,640	2.55	6,726	139,283	1.63	226,721
01 Banteay Mean Chey	30,750	1,000	63,750	129,250	1.28	165,440	150	0	150	3.00	450	129,400	1.28	165,890
15 Pousat	18,628	0	20,128	74,528	1.93	143,839	100	0	100	2.34	234	74,628	1.93	144,073
04 Kampong Chhnang	10,576	97	11,059	83,627	1.69	141,330	10,250	100	10,150	3.26	33,069	93,777	1.86	174,399
18 Krong Preah Sihanouk	69	1,700	1,872	7,750	1.70	13,175	0	0	0	-	0	7,750	1.70	13,175
23 Krong Kaeb	0	0	0	2,594	1.69	4,384	0	0	0	-	0	2,594	1.69	4,384
07 Kampot	12,260	0	12,260	136,500	1.86	253,890	4,700	80	4,620	0.00	0	141,120	1.80	253,890
09 Kaoh Kong	2,644	0	2,644	7,340	1.53	11,230	0	0	0	-	0	7,340	1.53	11,230
05 Kampong Spueu	14,962	0	15,100	79,368	1.47	116,671	1,000	200	800	3.10	2,480	80,168	1.49	119,151
13 Preah Vihear	3,303	0	3,303	15,755	1.52	23,947	0	0	0	-	0	15,755	1.52	23,947
19 Stueng Traeng	5,003	229	10,180	8,913	1.59	14,172	0	0	0	-	0	8,913	1.59	14,172
16 Roranak Kiri	759	30	1,050	18,939	1.55	29,355	0	0	0	-	0	18,939	1.55	29,355
11 Modol Kiri	205	0	1,705	6,185	1.57	9,711	0	0	0	-	0	6,185	1.57	9,711
10 Kracheh	25	10	1,020	26,160	1.63	42,641	6,000	100	5,900	2.50	14,750	32,060	1.79	57,391
22 Otdar Mean Chey	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
24 Krong Pailin	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Sub-total (Study area)	197,800	4,805	277,495	1,132,739	1.61	1,824,822	234,235	4,520	229,715	3.13	719,776	1,362,454	1.87	2,544,598
Total	272,590	9,540	404,655	1,684,906	1.59	2,672,597	248,683	4,900	243,783	3.05	742,323	1,928,689	1.77	3,414,920

Table A.1 (7/10) Paddy Production

Crop Year 1996/1997

Province	Wet Season Rice 1996/1997													
	Cultivated Area (ha)							Destroyed Area (ha)					Damaged Area	
	Early Rice		Medium	Upland	Late	Floating	Total	Flood	Mouse	Drought	Insect	Total	Flood	Mouse
	Total	(IR)												
12 Phnom Penh	1,322	300	4,496	0	1,917	5	7,740	1,950	0	0	0	1,950	1,950	0
08 Kandal	9,415	6,802	16,609	484	16,974	3,328	46,810	13,810	0	0	0	13,810	17,455	0
04 Kampong Cham	44,683	12,500	45,622	8,823	76,863	1,029	177,020	17,520	0	0	0	17,520	31,539	0
20 Svay Rieng	34,497	12,850	69,646	0	61,314	83	165,540	9,640	0	0	4,900	14,540	17,241	0
14 Prey Veaeng	51,662	26,983	115,300	0	84,493	295	251,750	75,750	0	0	0	75,750	136,974	0
21 Takeav	75,130	17,020	82,232	0	22,728	7,970	188,060	34,060	0	0	0	34,060	47,544	0
06 Kampong Thum	24,863	1,868	39,383	2,400	36,044	29,520	132,210	23,110	0	0	100	23,210	32,218	0
17 Siem Reab	38,645	1,620	65,425	7,496	63,984	6,660	182,210	13,110	0	300	300	13,710	16,415	0
02 Bat Dambang	14,200	136	27,763	253	101,077	10,507	153,800	33,500	0	0	300	33,800	37,506	0
01 Banteay Mean Chey	15,840	1,250	40,340	0	71,970	16,450	144,600	17,100	0	0	500	17,600	30,500	0
15 Pousat	20,375	462	26,806	0	31,425	3,994	82,600	7,100	0	0	0	7,100	37,000	0
04 Kampong Chhnang	22,025	1,000	34,583	231	25,655	2,006	84,500	8,000	0	0	0	8,000	14,260	0
18 Krong Preah Sihanouk	712	0	6,478	0	1,940	0	9,130	230	0	0	0	230	448	0
23 Krong Kaeb	500	0	1,315	30	755	0	2,600	0	0	0	0	0	0	0
07 Kampot	10,026	9,393	104,058	1,380	20,308	298	136,070	5,970	0	100	0	6,070	8,658	0
09 Kaoh Kong	400	0	1,500	50	5,460	0	7,410	0	0	0	0	0	0	0
05 Kampong Spueu	21,472	1,251	43,681	966	20,251	10	86,380	880	0	0	0	880	1,313	0
13 Preah Vihear	1,300	0	6,100	500	9,600	0	17,500	3,000	0	0	0	3,000	3,000	0
19 Stueng Traeng	3,600	0	3,395	1,175	3,945	45	12,160	7,360	0	0	0	7,360	7,348	0
16 Roranak Kiri	500	0	5,868	5,000	7,502	0	18,870	1,870	0	0	0	1,870	1,678	0
11 Modol Kiri	1,000	0	1,305	2,290	1,505	0	6,100	1,600	0	0	0	1,600	1,600	0
10 Kracheh	1,566	110	13,736	793	7,745	0	23,840	5,840	0	0	0	5,840	13,000	0
22 Otdar Mean Chey	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
24 Krong Pailin	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Sub-total (Study area)	313,051	80,462	505,357	18,253	475,256	31,893	1,343,810	208,220	0	300	5,500	214,020	322,197	0
Total	393,733	93,545	755,641	31,871	673,455	82,200	1,936,900	281,400	0	400	6,100	287,900	457,647	0

Legend: = Study Area
 Source: Agricultural Statistics, 1996/97
 Department of Planning and Statistics, MAFF

Table A.1 (8/10) Paddy Production

Crop Year 1996/1997 (cont'd)

Province	Damaged Area (ha)			Harvested Area (ha)	Yield (t/ha)	Production (ton)	Dry Season Rice 1996/1997					Total 1996/1997		
	Drought	Insect	Total				Cultivated Area (ha)	Destroyed Area (ha)	Harvested Area (ha)	Yield (t/ha)	Production (ton)	Harvested Area (ha)	Yield (t/ha)	Production (ton)
12 Phnom Penh	0	0	1,950	5,790	2.22	12,850	1,270	0	1,270	2.68	3,400	7,060	2.30	16,250
08 Kandal	0	0	17,455	33,000	2.00	66,000	45,000	1,000	44,000	3.94	173,220	77,000	3.11	239,220
04 Kampong Cham	0	0	31,539	159,500	2.10	334,950	30,740	670	30,070	2.56	76,860	189,570	2.17	411,810
20 Svay Rieng	4,902	0	22,143	151,000	1.40	211,400	10,000	0	10,000	3.00	30,000	161,000	1.50	241,400
14 Prey Veang	0	0	136,974	176,000	1.75	308,800	56,740	740	56,000	3.26	182,470	232,000	2.12	491,270
21 Takeav	0	0	47,544	154,000	1.80	277,200	57,000	1,000	56,000	2.81	157,080	210,000	2.07	434,280
06 Kampong Thum	965	93	33,276	109,000	1.60	174,400	2,000	0	2,000	1.90	3,800	111,000	1.61	178,200
17 Siem Reab	320	350	17,085	168,500	1.20	202,200	9,970	70	9,900	1.97	19,540	178,400	1.24	221,740
02 Bat Dambang	350	0	37,856	120,000	2.12	254,000	1,225	25	1,200	2.50	3,000	121,200	2.12	257,000
01 Banteay Mean Chey	500	0	31,000	127,000	1.51	191,500	65	0	65	2.46	160	127,065	1.51	191,660
15 Pousat	0	0	37,000	75,500	1.50	113,500	700	5	695	1.86	1,290	76,195	1.51	114,790
04 Kampong Chhnang	0	0	14,260	76,500	1.55	118,580	9,500	400	9,100	2.99	27,230	85,600	1.70	145,810
18 Krong Preah Sihanouk	72	0	520	8,900	1.85	16,470	0	0	0	-	0	8,900	1.85	16,470
23 Krong Kaeb	0	0	0	2,600	1.60	4,160	0	0	0	-	0	2,600	1.60	4,160
07 Kampot	0	175	8,833	130,000	1.60	208,000	2,600	0	2,600	1.92	5,000	132,600	1.61	213,000
09 Kaoh Kong	0	0	0	7,410	1.30	9,630	0	0	0	-	0	7,410	1.30	9,630
05 Kampong Spueu	0	0	1,313	85,500	1.95	166,730	1,300	0	1,300	2.00	2,600	86,800	1.95	169,330
13 Preah Vihear	0	0	3,000	14,500	1.50	21,750	0	0	0	-	0	14,500	1.50	21,750
19 Stueng Traeng	0	0	7,348	4,800	1.60	7,680	0	0	0	-	0	4,800	1.60	7,680
16 Roranak Kiri	0	0	1,678	17,000	1.30	22,100	0	0	0	-	0	17,000	1.30	22,100
11 Modol Kiri	0	0	1,600	4,500	1.44	6,500	0	0	0	-	0	4,500	1.44	6,500
10 Kracheh	0	0	13,000	18,000	1.70	30,600	5,890	90	5,800	2.30	13,350	23,800	1.85	43,950
22 Otdar Mean Chey	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
24 Krong Pailin	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Sub-total (Study area)	5,572	350	328,119	1,129,790	1.73	1,952,710	222,745	3,905	218,840	3.09	675,400	1,348,630	1.95	2,628,110
Total	7,109	618	465,374	1,649,000	1.67	2,759,000	234,000	4,000	230,000	3.04	699,000	1,879,000	1.84	3,458,000

Table A.1 (9/10) Paddy Production
Crop Year 1995/1996

Province	Wet Season Rice 1995/1996													
	Cultivated Area (ha)							Destroyed Area (ha)					Damaged Area	
	Early Rice		Medium	Upland	Late	Floating	Total	Flood	Mouse	Drought	Insect	Total	Flood	Mouse
Total	(IR)													
12 Phnom Penh	183	107	6,346	0	2,051	0	8,580	1,542	0	0	0	1,542	0	0
08 Kandal	8,217	5,664	17,418	1,736	17,494	3,682	48,547	3,888	0	298	0	4,186	0	0
04 Kampong Cham	28,492	4,419	55,081	8,127	74,936	864	167,500	0	0	0	0	0	0	0
20 Svay Rieng	27,050	1,695	74,945	146	51,944	142	154,227	5,712	0	8	1,450	7,170	0	0
14 Prey Veaeng	48,313	21,933	87,302	0	92,775	941	229,331	22,087	0	0	2,219	24,306	0	0
21 Takeav	78,459	60,293	74,034	0	25,069	7,303	184,865	7,706	0	0	0	7,706	0	0
06 Kampong Thum	21,209	1,329	36,822	1,800	35,516	30,797	126,144	12,899	0	2,081	849	15,829	0	0
17 Siem Reab	36,325	0	60,925	7,545	63,910	7,450	176,155	11,000	0	0	140	11,140	0	0
02 Bat Dambang	9,350	210	27,337	0	125,346	11,290	173,323	27,960	0	0	0	27,960	0	0
01 Banteay Mean Chey	14,820	0	36,720	0	75,030	14,580	141,150	38,868	0	0	0	38,868	0	0
15 Pousat	16,000	185	26,000	122	33,277	4,601	80,000	9,134	0	0	0	9,134	0	0
04 Kampong Chhnang	21,249	0	34,331	326	21,284	1,789	78,979	3,135	0	0	0	3,135	0	0
18 Krong Preah Sihanouk	465	0	6,080	0	2,262	0	8,807	804	0	0	0	804	0	0
23 Krong Kaeb	400	0	1,500	0	694	0	2,594	0	0	0	0	0	0	0
07 Kampot	10,235	2,116	101,264	952	16,806	401	129,658	302	0	1,643	0	1,945	0	0
09 Kaoh Kong	557	0	2,187	1,929	520	0	5,193	121	0	0	0	121	0	0
05 Kampong Spueu	23,393	1,607	44,245	679	16,358	0	84,675	1,343	0	4,744	283	6,370	0	0
13 Preah Vihear	700	100	8,700	1,200	6,400	0	17,000	0	0	0	0	0	0	0
19 Stueng Traeng	5,750	0	4,205	1,587	1,909	49	13,500	0	0	0	0	0	0	0
16 Roranak Kiri	406	0	1,460	8,727	2,404	0	12,997	0	0	0	0	0	0	0
11 Modol Kiri	920	0	750	2,280	1,550	0	5,500	0	0	0	0	0	0	0
10 Kracheh	1,805	307	13,736	743	4,982	0	21,266	734	0	0	0	734	0	0
22 Otdar Mean Chey	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
24 Krong Pailin	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Sub-total (Study area)	281,031	95,928	481,964	18,559	491,167	33,461	1,306,182	84,373	0	5,050	4,092	93,515	0	0
Total	354,298	99,965	721,388	37,899	672,517	83,889	1,869,991	147,235	0	8,774	4,941	160,950	0	0

Legend: = Study Area
Source: Agricultural Statistics, 1995
Department of Planning and Statistics, MAFF

Table A.1 (10/10) Paddy Production
Crop Year 1995/1996 (cont'd)

Province	Damaged Area (ha)			Harvested Area (ha)	Yield (t/ha)	Production (ton)	Dry Season Rice 1995/1996					Total 1995/1996		
	Drought	Insect	Total				Cultivated Area (ha)	Destroyed Area (ha)	Harvested Area (ha)	Yield (t/ha)	Production (ton)	Harvested Area (ha)	Yield (t/ha)	Production (ton)
12 Phnom Penh	0	0	0	7,038	1.82	12,810	1,270	0	1,270	2.36	3,000	8,308	1.90	15,810
08 Kandal	0	0	0	44,361	2.23	98,925	44,147	671	43,476	3.45	150,200	87,837	2.84	249,125
04 Kampong Cham	0	0	0	167,500	1.60	268,000	23,640	0	23,640	2.41	57,000	191,140	1.70	325,000
20 Svay Rieng	0	0	0	147,057	1.36	200,000	5,570	0	5,570	2.60	14,500	152,627	1.41	214,500
14 Prey Veaeng	0	0	0	205,025	1.70	348,425	56,720	0	56,720	3.55	201,200	261,745	2.10	549,625
21 Takeav	0	0	0	177,159	1.65	292,312	52,712	0	52,712	2.75	145,000	229,871	1.90	437,312
06 Kampong Thum	0	0	0	110,315	1.45	159,960	1,703	104	1,599	1.88	3,000	111,914	1.46	162,960
17 Siem Reab	0	0	0	165,015	1.40	231,035	9,510	25	9,485	2.16	20,500	174,500	1.44	251,535
02 Bat Dambang	0	0	0	145,363	1.98	287,820	2,428	0	2,428	3.01	7,300	147,791	2.00	295,120
01 Banteay Mean Chey	0	0	0	102,282	1.44	147,287	538	0	538	2.36	1,270	102,820	1.44	148,557
15 Pousat	0	0	0	70,866	1.45	102,756	1,039	26	1,013	2.47	2,500	71,879	1.46	105,256
04 Kampong Chhnang	0	0	0	75,844	1.71	129,791	8,290	170	8,120	2.59	21,000	83,964	1.80	150,791
18 Krong Preah Sihanouk	0	0	0	8,003	1.72	13,765	0	0	0	-	0	8,003	1.72	13,765
23 Krong Kaeb	0	0	0	2,594	1.60	4,150	0	0	0	-	0	2,594	1.60	4,150
07 Kampot	0	0	0	127,713	1.65	210,521	2,006	0	2,006	2.24	4,500	129,719	1.66	215,021
09 Kaoh Kong	0	0	0	5,072	1.60	8,115	0	0	0	-	0	5,072	1.60	8,115
05 Kampong Spueu	0	0	0	78,305	2.16	169,310	983	4	979	2.55	2,500	79,284	2.17	171,810
13 Preah Vihear	0	0	0	17,000	1.80	30,600	0	0	0	-	0	17,000	1.80	30,600
19 Stueng Traeng	0	0	0	13,500	1.70	22,950	0	0	0	-	0	13,500	1.70	22,950
16 Roranak Kiri	0	0	0	12,997	1.70	22,095	0	0	0	-	0	12,997	1.70	22,095
11 Modol Kiri	0	0	0	5,500	1.70	9,350	14	0	14	-	30	5,514	1.70	9,380
10 Kracheh	0	0	0	20,532	1.60	32,850	5,430	0	5,430	2.12	11,500	25,962	1.71	44,350
22 Otdar Mean Chey	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
24 Krong Pailin	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Sub-total (Study area)	0	0	0	1,212,667	1.68	2,038,428	205,270	870	204,400	3.04	622,200	1,417,067	1.88	2,660,628
Total	0	0	0	1,709,041	1.64	2,802,827	216,000	1,000	215,000	3.00	645,000	1,924,041	1.79	3,447,827

Table A.2 (1/3) Province-wise Balance of Rice (1998/99)

Province	Region	Supply of Rice							Demand of Rice			Balance	
		Paddy Production			Seed Req't	P.H. Loss	Availability		Population	Per capita Demand	Total Demand		
		Area (ha)	Yield	Production			Paddy	Rice					
1	Phnom Penh	Plain	9,053	1.69	15,290	905	1,694	12,691	7,868	999,804	0.1512	151,170	-143,302
2	Kandal	Plain	88,350	2.61	230,800	8,835	30,401	191,564	118,770	1,075,125	0.1512	162,559	-43,789
3	Prey Veang	Plain	261,785	1.63	425,945	26,179	46,232	353,534	219,191	946,042	0.1512	143,042	76,150
4	Kampong Cham	Plain	188,877	2.32	438,600	18,888	55,674	364,038	225,704	1,608,914	0.1512	243,268	-17,564
5	Svay Rieng	Plain	163,800	1.07	175,700	16,380	13,489	145,831	90,415	478,252	0.1512	72,312	18,104
6	Takev	Plain	228,973	1.94	443,680	22,897	52,528	368,254	228,318	790,168	0.1512	119,473	108,844
7	Kampong Chhnang	Tonle S.	89,913	1.84	165,300	8,991	19,110	137,199	85,063	417,693	0.1512	63,155	21,908
8	Bat Dambang	Tonle S.	203,333	1.66	336,980	20,333	36,953	279,693	173,410	793,129	0.1512	119,921	53,489
9	Siem Reab	Tonle S.	192,175	1.31	252,310	19,218	23,675	209,417	129,839	696,164	0.1512	105,260	24,579
10	Kampong Spueu	Plt/Mt.	84,635	1.41	119,500	8,464	11,852	99,185	61,495	598,882	0.1512	90,551	-29,056
Sub-total (Study Area)			1,510,894	1.72	2,604,105	151,089	291,608	2,161,407	1,340,072	8,404,173	0.1512	1,270,711	69,361
11	Kampong Thum	Tonle S.	123,452	1.66	204,950	12,345	22,496	170,109	105,467	569,060	0.1512	86,042	19,425
12	Banteay Mean Chey	Tonle S.	157,800	1.53	240,770	15,780	25,151	199,839	123,900	577,772	0.1512	87,359	36,541
13	Pousat	Tonle S.	77,247	1.61	124,640	7,725	13,464	103,451	64,140	360,445	0.1512	54,499	9,640
14	Otdar Mean Chey*1	Tonle S.								68,279	0.1512	10,324	-10,324
15	Krong Pailin*2	Tonle S.								22,906	0.1512	3,463	-3,463
16	Krong Preah Sihanouk	Coastal	9,645	1.57	15,166	965	1,614	12,588	7,804	155,690	0.1512	23,540	-15,736
17	Kampot	Coastal	131,535	1.46	192,300	13,154	19,538	159,609	98,958	528,405	0.1512	79,895	19,063
18	Kaoh Kong	Coastal	7,115	1.26	8,965	712	813	7,441	4,613	132,106	0.1512	19,974	-15,361
19	Krong Kaeb	Coastal	2,594	1.46	3,787	259	384	3,143	1,949	28,660	0.1512	4,333	-2,385
20	Preah Vihear	Plt/Mt.	15,000	1.21	18,174	1,500	1,590	15,084	9,352	119,261	0.1512	18,032	-8,680
21	Stueng Traeng	Plt/Mt.	16,000	1.21	19,363	1,600	1,692	16,071	9,964	81,074	0.1512	12,258	-2,294
22	Rotanak Kiri	Plt/Mt.	17,423	1.17	20,435	1,742	1,732	16,961	10,516	94,243	0.1512	14,250	-3,734
23	Mondol Kiri	Plt/Mt.	5,000	1.06	5,316	500	404	4,412	2,736	32,407	0.1512	4,900	-2,164
24	Kracheh	Plt/Mt.	30,308	1.71	51,900	3,031	5,792	43,077	26,708	263,175	0.1512	39,792	-13,084
Sub-total (Non Study Area)			593,119	1.53	905,766	59,312	94,668	751,786	466,107	3,033,483	0.1512	458,663	7,445
Total			2,104,013	1.67	3,509,871	210,401	386,277	2,913,193	1,806,180	11,437,656	0.1512	1,729,374	76,806

Note: *1 Deficit is probably supplied by Province of Siem Reab; *2 Deficit is probably supplied by Bat Dambang Province

Table A.2 (2/3) Province-wise Balance of Rice (1997/98)

Province	Region	Supply of Rice								Demand of Rice			Balance
		Paddy Production			Seed Req't	P.H. Loss	Availability		Population	Per capita Demand	Total Demand		
		Area (ha)	Yield	Production			Paddy	Rice					
1	Phnom Penh	Plain	9,045	1.76	15,946	905	1,806	13,235	8,206	954,011	0.1512	144,247	-136,041
2	Kandal	Plain	88,891	2.41	213,873	8,889	27,469	177,515	110,059	1,025,883	0.1512	155,113	-45,054
3	Prey Veang	Plain	237,652	1.83	435,060	23,765	50,195	361,100	223,882	902,712	0.1512	136,490	87,392
4	Kampong Cham	Plain	176,937	1.85	326,873	17,694	37,875	271,305	168,209	1,535,223	0.1512	232,126	-63,917
5	Svay Rieng	Plain	163,681	1.30	212,003	16,368	19,672	175,962	109,097	456,347	0.1512	69,000	40,097
6	Takev	Plain	231,648	2.53	585,559	23,165	76,380	486,014	301,329	753,977	0.1512	114,001	187,327
7	Kampong Chhnang	Tonle S.	94,360	1.85	174,398	9,436	20,212	144,750	89,745	398,562	0.1512	60,263	29,483
8	Bat Dambang	Tonle S.	195,705	1.16	226,721	19,571	18,972	188,178	116,671	756,802	0.1512	114,429	-1,063
9	Siem Reab	Tonle S.	188,820	1.24	235,012	18,882	21,070	195,060	120,937	664,279	0.1512	100,439	15,573
10	Kampong Spueu	Plt/Mt.	82,931	1.44	119,151	8,293	11,963	98,895	61,315	571,452	0.1512	86,404	-25,088
Sub-total (Study Area)			1,469,670	1.73	2,544,596	146,967	285,614	2,112,015	1,309,449	8,019,249	0.1512	1,212,510	88,708
11	Kampong Thum	Tonle S.	130,999	1.09	143,104	13,100	11,228	118,776	73,641	542,996	0.1512	82,101	-8,460
12	Banteay Mean Chey	Tonle S.	149,400	1.11	165,890	14,940	13,261	137,689	85,367	551,309	0.1512	83,358	-2,916
13	Pousat	Tonle S.	76,128	1.89	144,073	7,613	16,880	119,581	74,140	343,936	0.1512	52,003	22,137
14	Otdar Mean Chey	Tonle S.								65,152	0.1512	9,851	
15	Krong Pailin	Tonle S.								21,857	0.1512	3,305	
16	Krong Preah Sihanouk	Coastal	9,450	1.39	13,175	945	1,295	10,935	6,780	148,559	0.1512	22,462	-15,682
17	Kampot	Coastal	141,200	1.80	253,890	14,120	29,041	210,729	130,652	504,203	0.1512	76,236	54,416
18	Kaoh Kong	Coastal	7,340	1.53	11,230	734	1,175	9,321	5,779	126,055	0.1512	19,060	-13,281
19	Krong Kaeb	Coastal	2,594	1.69	4,384	259	486	3,639	2,256	27,347	0.1512	4,135	-1,879
20	Preah Vihear	Plt/Mt.	15,755	1.52	23,947	1,576	2,495	19,876	12,323	113,799	0.1512	17,206	-4,883
21	Stueng Traeng	Plt/Mt.	14,262	0.99	14,172	1,426	983	11,763	7,293	77,361	0.1512	11,697	-4,404
22	Rotanak Kiri	Plt/Mt.	19,883	1.48	29,355	1,988	3,002	24,365	15,106	89,927	0.1512	13,597	1,509
23	Mondol Kiri	Plt/Mt.	6,185	1.57	9,711	619	1,032	8,060	4,997	30,923	0.1512	4,676	322
24	Kracheh	Plt/Mt.	33,145	1.73	57,391	3,315	6,442	47,635	29,533	251,121	0.1512	37,970	-8,436
Sub-total (Non Study Area)			606,341	1.44	870,322	60,634	87,321	722,367	447,868	2,894,545	0.1512	437,655	18,443
Total			2,076,011	1.64	3,414,918	207,601	372,935	2,834,382	1,757,317	10,913,794	0.1512	1,650,166	107,151

Note: *1 Deficit is evenly allocated to Provinces of Siem Reab and Banteay Mean Chey; *2 Allocated to Bat Dambang Province

Table A.2 (3/3) Province-wise Balance of Rice (1996/97)

Province	Region	Supply of Rice							Demand of Rice			Balance	
		Paddy Production			Seed Req't	P.H. Loss	Availability		Population	Per capita Demand	Total Demand		
		Area (ha)	Yield	Production			Paddy	Rice					
1	Phnom Penh	Plain	9,010	1.76	15,850	901	1,794	13,156	8,156	910,316	0.1512	137,640	-129,483
2	Kandal	Plain	90,957	2.38	216,200	9,096	27,658	179,446	111,257	978,896	0.1512	148,009	-36,753
3	Prey Veang	Plain	308,470	1.65	510,000	30,847	55,853	423,300	262,446	861,366	0.1512	130,239	132,207
4	Kampong Cham	Plain	200,660	1.95	391,950	20,066	46,566	325,319	201,697	1,464,908	0.1512	221,494	-19,797
5	Svay Rieng	Plain	171,110	1.32	225,900	17,111	21,292	187,497	116,248	435,446	0.1512	65,839	50,409
6	Takev	Plain	240,772	1.75	422,200	24,077	47,697	350,426	217,264	719,444	0.1512	108,780	108,484
7	Kampong Chhnang	Tonle S.	92,790	1.50	139,580	9,279	14,450	115,851	71,828	380,307	0.1512	57,502	14,325
8	Bat Dambang	Tonle S.	156,228	1.67	261,300	15,623	28,798	216,879	134,465	722,140	0.1512	109,188	22,124
9	Siem Reab	Tonle S.	191,720	1.16	222,700	19,172	18,687	184,841	114,601	633,854	0.1512	95,839	14,063
10	Kampong Spueu	Plt/Mt.	87,363	1.94	169,230	8,736	20,033	140,461	87,086	545,279	0.1512	82,446	4,640
Sub-total (Study Area)			1,549,080	1.66	2,574,910	154,908	282,827	2,137,175	1,325,049	7,651,955	0.1512	1,156,976	160,220
11	Kampong Thum	Tonle S.	133,913	1.32	177,400	13,391	16,767	147,242	91,290	518,126	0.1512	78,341	12,949
12	Banteay Mean Chey	Tonle S.	145,138	1.33	192,770	14,514	18,257	159,999	99,199	526,058	0.1512	79,540	14,960
13	Pousat	Tonle S.	83,639	1.39	116,000	8,364	11,356	96,280	59,694	328,183	0.1512	49,621	10,072
14	Otdar Mean Chey*1	Tonle S.								62,168	0.1512	9,400	
15	Krong Pailin*2	Tonle S.								20,856	0.1512	3,153	
16	Krong Preah Sihanouk	Coastal	9,130	1.80	16,470	913	1,887	13,670	8,475	141,755	0.1512	21,433	-12,958
17	Kampot	Coastal	138,076	1.54	212,500	13,808	22,317	176,375	109,353	481,110	0.1512	72,744	36,609
18	Kaoh Kong	Coastal	7,410	1.30	9,630	741	896	7,993	4,956	120,282	0.1512	18,187	-13,231
19	Krong Kaeb	Coastal	2,600	1.60	4,160	260	447	3,453	2,141	26,095	0.1512	3,946	-1,805
20	Preah Vihear	Plt/Mt.	17,500	1.24	21,750	1,750	1,948	18,053	11,193	108,587	0.1512	16,418	-5,226
21	Stueng Traeng	Plt/Mt.	12,160	0.63	7,680	1,216	90	6,374	3,952	73,817	0.1512	11,161	-7,209
22	Rotanak Kiri	Plt/Mt.	18,870	1.17	22,100	1,887	1,870	18,343	11,373	85,808	0.1512	12,974	-1,601
23	Mondol Kiri	Plt/Mt.	6,114	1.07	6,530	611	499	5,420	3,360	29,506	0.1512	4,461	-1,101
24	Kracheh	Plt/Mt.	29,270	1.44	42,100	2,927	4,230	34,943	21,665	239,619	0.1512	36,230	-14,566
Sub-total (Non Study Area)			603,820	1.37	829,090	60,382	80,563	688,145	426,650	2,761,970	0.1512	417,610	16,893
Total			2,152,900	1.58	3,404,000	215,290	363,390	2,825,320	1,751,698	10,413,925	0.1512	1,574,586	177,113

Note: *1 Deficit is evenly allocated to Provinces of Siem Reab and Banteay Mean Chey; *2 Allocated to Bat Dambang Province

Table A.3 (1/10) Monthly Balance of Rice by Province

12 Phnom Penh

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Harvested Area (ha)	Production (ton)	Remarks
1 Wet/Early Rice (ton)	50% 181											50% 181	201	362	
3 Wet/Medium Rice											50% 2,778	50% 2,778	3,088	5,557	
4 Wet/Upland													0	0	
5 Wet/Late Rice	30% 1,078										30% 1,078	40% 1,437	1,996	3,592	
6 Wet/Floating Rice												100% 200	111	200	
sub-total:													5,396	9,710	
7 Dry Season Rice			10% 240	35% 840	45% 1,080	10% 240							1,200	2,400	
Total:	1,258	0	240	840	1,080	240	0	0	0	0	0	3,856	4,596	6,596	12,110

Source: (1) Crop Calendar: Provincial Department of Agriculture
 (2) Area, Production: WFP Commune Database
 (3) Percentage of Harvesting: Department of Agronomy, MAFF

Monthly Surplus or Deficit

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
1 Availability: Paddy	1,044	0	199	697	896	199	0	0	0	0	3,200	3,814	10,051	Seed: 10%, Loss: 5%, Feed: 2%
2 Availability: White Rice	648	0	124	432	556	124	0	0	0	0	1,984	2,365	6,232	Milling recovery: 62%
3 Demand of Rice	13,519	12,211	13,519	13,083	13,519	13,083	13,519	13,519	13,083	13,519	13,083	13,519	159,175	151.2kg/y: Population 1,052,743
4 Surplus, deficit: Rice	-12,871	-12,211	-13,395	-12,651	-12,963	-12,959	-13,519	-13,519	-13,083	-13,519	-11,099	-11,154	-152,943	
5 Cumulative of s/d	-12,871	-25,082	-38,478	-51,128	-64,091	-77,051	-90,570	-104,089	-117,171	-130,690	-141,789	-152,943		

Table A.3 (2/10) Monthly Balance of Rice by Province

08 Kandal

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Harvested Area (ha)	Production (ton)	Remarks
1 Wet/Early Rice (ton)							50% 5,390	50% 5,390					4,965	10,779	
3 Wet/Medium Rice	40% 14,349										20% 7,174	40% 14,349	16,523	35,872	
4 Wet/Upland													0	0	
5 Wet/Late Rice		65% 24,843	35% 13,377										17,605	38,221	
6 Wet/Floating Rice	100% 7,774												3,581	7,774	
sub-total:													42,674	92,646	
7 Dry Season Rice						100% 153,685							45,000	153,685	
Total Production:	22,123	24,843	13,377	0	0	153,685	5,390	5,390	0	0	7,174	14,349	87,674	246,331	

Source: (1) Crop Calendar: Provincial Department of Agriculture
 (2) Area, Production: WFP Commune Database
 (3) Percentage of Harvesting: Department of Agronomy, MAFF

Monthly Surplus or Deficit

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
1 Availability: Paddy	18,362	20,620	11,103	0	0	127,559	4,473	4,473	0	0	5,955	11,909	204,455	Seed: 10%, Loss: 5%, Feed: 2% Milling recovery: 62% 151.2kg/y: Population 1,132,491
2 Availability: White Rice	11,385	12,784	6,884	0	0	79,086	2,773	2,773	0	0	3,692	7,384	126,762	
3 Demand of Rice	14,543	13,136	14,543	14,074	14,543	14,074	14,543	14,543	14,074	14,543	14,074	14,543	171,233	
4 Surplus, deficit: Rice	-3,158	-351	-7,659	-14,074	-14,543	65,012	-11,770	-11,770	-14,074	-14,543	-10,382	-7,159	-44,471	
5 Cumulative of s/d	-3,158	-3,510	-11,169	-25,243	-39,786	25,227	13,457	1,687	-12,386	-26,929	-37,311	-44,471		

Table A.3 (3/10) Monthly Balance of Rice by Province

14 Prey Veang

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Harvested Area (ha)	Production (ton)	Remarks
1 Wet/Early Rice (ton)	10% 5,956	5% 2,978						5% 2,978	10% 5,956	20% 11,911	25% 14,889	25% 14,889	35,206	59,557	
3 Wet/Medium Rice	25% 47,385										25% 47,385	50% 94,770	112,043	189,539	
4 Wet/Upland													0	0	
5 Wet/Late Rice	50% 78,174	50% 78,174											92,423	156,349	
6 Wet/Floating Rice	40% 374	40% 374	20% 187										553	935	
sub-total:													240,225	406,380	
7 Dry Season Rice				10% 17,100	35% 59,850	45% 76,950	10% 17,100						57,000	171,000	
Total:	131,889	81,526	187	17,100	59,850	76,950	17,100	2,978	5,956	11,911	62,274	109,659	297,225	577,380	

Source: (1) Crop Calendar: Provincial Department of Agriculture
 (2) Area, Production: WFP Commune Database
 (3) Percentage of Harvesting: Department of Agronomy, MAFF

Monthly Surplus or Deficit

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
1 Availability: Paddy	109,468	67,667	155	14,193	49,676	63,869	14,193	2,472	4,943	9,886	51,687	91,017	479,225	Seed: 10%, Loss: 5%, Feed: 2%
2 Availability: White Rice	67,870	41,953	96	8,800	30,799	39,598	8,800	1,532	3,065	6,130	32,046	56,430	297,120	Milling recovery: 62%
3 Demand of Rice	12,803	11,564	12,803	12,390	12,803	12,390	12,803	12,803	12,390	12,803	12,390	12,803	150,744	151.2kg/y: Population 996,985
4 Surplus/Deficit: Rice	55,067	30,390	-12,707	-3,590	17,996	27,209	-4,003	-11,271	-9,325	-6,673	19,656	43,627	146,376	
5 Cumulative of s/d	55,067	85,457	72,750	69,160	87,156	114,364	110,361	99,090	89,765	83,092	102,748	146,376		

Table A.3 (4/10) Monthly Balance of Rice by Province

03 Kampong Cham

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Harvested Area (ha)	Production (ton)	Remarks
1 Wet/Early Rice (ton)	20% 13,286								20% 13,286	20% 13,286	20% 13,286	20% 13,286	30,195	66,429	
3 Wet/Medium Rice											30% 39,503	70% 92,174	59,853	131,677	
4 Wet/Upland													0	0	
5 Wet/Late Rice	50% 84,766	50% 84,766											77,060	169,532	
6 Wet/Floating Rice	50% 149	50% 149											135	297	
sub-total:													167,243	367,935	
7 Dry Season Rice		20% 18,600	35% 32,550	45% 41,850									30,000	93,000	
Total:	98,200	103,515	32,550	41,850	0	0	0	0	13,286	13,286	52,789	105,460	197,243	460,935	

Source: (1) Crop Calendar: Provincial Department of Agriculture
 (2) Area, Production: WFP Commune Database
 (3) Percentage of Harvesting: Department of Agronomy, MAFF

Monthly Surplus or Deficit

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
1 Availability: Paddy	81,506	85,917	27,017	34,736	0	0	0	0	11,027	11,027	43,815	87,531	382,576	Seed: 10%, Loss: 5%, Feed: 2%
2 Availability: White Rice	50,534	53,269	16,750	21,536	0	0	0	0	6,837	6,837	27,165	54,269	237,197	Milling recovery: 62%
3 Demand of Rice	21,781	19,673	21,781	21,079	21,781	21,079	21,781	21,781	21,079	21,781	21,079	21,781	256,456	151.2kg/y: Population 1,696,135
4 Surplus, deficit: Rice	28,753	33,595	-5,031	457	-21,781	-21,079	-21,781	-21,781	-14,242	-14,944	6,087	32,488	-19,258	
5 Cumulative of s/d	28,753	62,348	57,317	57,775	35,993	14,915	-6,866	-28,647	-42,889	-57,833	-51,747	-19,258		

Table A.3 (5/10) Monthly Balance of Rice by Province

20 Svay Rieng

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Harvested Area (ha)	Production (ton)	Remarks
1 Wet/Early Rice (ton)	25% 10,088	5% 2,018							10% 4,035	15% 6,053	20% 8,070	25% 10,088	26,901	40,352	
3 Wet/Medium Rice	30% 41,434										20% 27,623	50% 69,057	92,076	138,114	
4 Wet/Upland													0	0	
5 Wet/Late Rice	50% 32,495	50% 32,495											43,326	64,989	
6 Wet/Floating Rice	100% 23												15	23	
sub-total:													162,318	243,477	
7 Dry Season Rice		10% 2,340	35% 8,190	45% 10,530				10% 2,340					9,000	23,400	
Total:	84,039	36,852	8,190	10,530	0	0	2,340	0	4,035	6,053	35,693	79,145	171,318	266,877	

Source: (1) Crop Calendar: Provincial Department of Agriculture
 (2) Area, Production: WFP Commune Database
 (3) Percentage of Harvesting: Department of Agronomy, MAFF

Monthly Surplus or Deficit

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
1 Availability: Paddy	69,752	30,587	6,798	8,740	0	0	1,942	0	3,349	5,024	29,625	65,690	221,508	Seed: 10%, Loss: 5%, Feed: 2% Milling recovery: 62% 151.2kg/y: Population 504,331
2 Availability: White Rice	43,247	18,964	4,215	5,419	0	0	1,204	0	2,076	3,115	18,368	40,728	137,335	
3 Demand of Rice	6,476	5,850	6,476	6,268	6,476	6,268	6,476	6,476	6,268	6,476	6,268	6,476	76,255	
4 Surplus, deficit: Rice	36,770	13,114	-2,262	-849	-6,476	-6,268	-5,272	-6,476	-4,191	-3,362	12,100	34,252	61,080	
5 Cumulative of s/d	36,770	49,884	47,623	46,774	40,297	34,030	28,758	22,281	18,090	14,728	26,829	61,080		

Table A.3 (6/10) Monthly Balance of Rice by Province

21 Takaev

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Harvested Area (ha)	Production (ton)	Remarks
1 Wet/Early Rice (ton)									←30% 38,974	70%→ 90,939			59,051	129,913	
3 Wet/Medium Rice												←100% 201,369	91,531	201,369	
4 Wet/Upland													0	0	
5 Wet/Late Rice	→50% 22,109											←50% 22,109	20,099	44,218	
6 Wet/Floating Rice	←85% 4,582	→15% 809											2,450	5,390	
sub-total:													173,131	380,890	
7 Dry Season Rice			←25% 43,500	45% 78,300	→30% 52,200								58,000	174,000	
Total:	26,691	809	43,500	78,300	52,200	0	0	0	38,974	90,939	0	223,478	231,131	554,890	

Source: (1) Crop Calendar: Provincial Department of Agriculture
 (2) Area, Production: WFP Commune Database
 (3) Percentage of Harvesting: Department of Agronomy, MAFF

Monthly Surplus or Deficit

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
1 Availability: Paddy	22,153	671	36,105	64,989	43,326	0	0	0	32,348	75,479	0	185,487	460,559	Seed: 10%, Loss: 5%, Feed: 2%
2 Availability: White Rice	13,735	416	22,385	40,293	26,862	0	0	0	20,056	46,797	0	115,002	285,546	Milling recovery: 62%
3 Demand of Rice	10,698	9,662	10,698	10,353	10,698	10,353	10,698	10,698	10,353	10,698	10,353	10,698	125,955	151.2kg/y: Population 833,039
4 Surplus, deficit: Rice	3,037	-9,246	11,688	29,941	16,165	-10,353	-10,698	-10,698	9,703	36,100	-10,353	104,304	159,591	
5 Cumulative of s/d	3,037	-6,209	5,479	35,419	51,584	41,231	30,534	19,836	29,540	65,639	55,287	159,591		

Table A.3 (7/10) Monthly Balance of Rice by Province

04 Kampong Chhnang

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Harvested Area (ha)	Production (ton)	Remarks
1 Wet/Early Rice (ton)										10% 4,701	90% 42,312		31,342	47,013	
3 Wet/Medium Rice											50% 29,942	50% 29,942	39,922	59,883	
4 Wet/Upland													0	0	
5 Wet/Late Rice	50% 8,291											50% 8,291	11,054	16,581	
6 Wet/Floating Rice	50% 561											50% 561	748	1,122	
sub-total:													83,066	124,600	
7 Dry Season Rice			10% 2,970	90% 26,730									9,900	29,700	
Total:	8,852	0	2,970	26,730	0	0	0	0	0	4,701	72,254	38,793	92,966	154,300	

Source: (1) Crop Calendar: Provincial Department of Agriculture
 (2) Area, Production: WFP Commune Database
 (3) Percentage of Harvesting: Department of Agronomy, MAFF

Monthly Surplus or Deficit

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
1 Availability: Paddy	7,347	0	2,465	22,186	0	0	0	0	0	3,902	59,971	32,198	128,069	Seed: 10%, Loss: 5%, Feed: 2% Milling recovery: 62% 151.2kg/y: Population 439,879
2 Availability: White Rice	4,555	0	1,528	13,755	0	0	0	0	0	2,419	37,182	19,963	79,403	
3 Demand of Rice	5,649	5,102	5,649	5,467	5,649	5,467	5,649	5,649	5,467	5,649	5,467	5,649	66,510	
4 Surplus, deficit: Rice	-1,094	-5,102	-4,120	8,289	-5,649	-5,467	-5,649	-5,649	-5,467	-3,229	31,715	14,314	12,893	
5 Cumulative of s/d	-1,094	-6,196	-10,316	-2,028	-7,676	-13,143	-18,792	-24,440	-29,907	-33,136	-1,421	12,893		

Table A.3 (8/10) Monthly Balance of Rice by Province

02 Bat Dambang

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Harvested Area (ha)	Production (ton)	Remarks
1 Wet/Early Rice (ton)										←40% 18,801	35% 16,451	→25% 11,751	22,275	47,002	
3 Wet/Medium Rice											←50% 51,097	→50% 51,097	48,431	102,194	
4 Wet/Upland											←50% 0	→50% 0	0	0	
5 Wet/Late Rice	→50% 95,540											←50% 95,540	90,555	191,079	
6 Wet/Floating Rice	←85% 13,111	→15% 2,314											7,310	15,425	
sub-total:													168,571	355,700	
7 Dry Season Rice		←10% 216	→35% 756	→45% 972	→10% 216								1,200	2,160	
Total:	108,651	2,530	756	972	216	0	0	0	0	18,801	67,548	158,387	169,771	357,860	

Source: (1) Crop Calendar: Provincial Department of Agriculture
 (2) Area, Production: WFP Commune Database
 (3) Percentage of Harvesting: Department of Agronomy, MAFF

Monthly Surplus or Deficit

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
1 Availability: Paddy	90,180	2,100	627	807	179	0	0	0	0	15,605	56,065	131,461	297,024	Seed: 10%, Loss: 5%, Feed: 2%
2 Availability: White Rice	55,912	1,302	389	500	111	0	0	0	0	9,675	34,760	81,506	184,155	Milling recovery: 62%
3 Demand of Rice	10,728	9,690	10,728	10,382	10,728	10,382	10,728	10,728	10,382	10,728	10,382	10,728	126,314	151.2kg/y: Population 835,410
4 Surplus, deficit: Rice	45,184	-8,388	-10,339	-9,882	-10,617	-10,382	-10,728	-10,728	-10,382	-1,053	24,378	70,778	57,841	
5 Cumulative of s/d	45,184	36,796	26,457	16,575	5,958	-4,424	-15,152	-25,880	-36,262	-37,315	-12,937	57,841		

Table A.3 (9/10) Monthly Balance of Rice by Province

17 Siem Reab

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Harvested Area (ha)	Production (ton)	Remarks
1 Wet/Early Rice (ton)	15% 10,561								10% 7,040	25% 17,601	30% 21,121	20% 14,081	54,157	70,404	
3 Wet/Medium Rice											10% 8,779	90% 79,009	67,529	87,788	
4 Wet/Upland													0	0	
5 Wet/Late Rice	80% 54,777	20% 13,694											52,670	68,471	
6 Wet/Floating Rice	70% 6,119	30% 2,622											6,724	8,741	
sub-total:													181,080	235,404	
7 Dry Season Rice		10% 2,500	35% 8,750	45% 11,250	10% 2,500								10,000	25,000	
Total:	71,456	18,817	8,750	11,250	2,500	0	0	0	7,040	17,601	29,900	93,090	191,080	260,404	

Source: (1) Crop Calendar: Provincial Department of Agriculture
 (2) Area, Production: WFP Commune Database
 (3) Percentage of Harvesting: Department of Agronomy, MAFF

Monthly Surplus or Deficit

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
1 Availability: Paddy	59,309	15,618	7,263	9,338	2,075	0	0	0	5,844	14,609	24,817	77,264	216,135	Seed: 10%, Loss: 5%, Feed: 2% Milling recovery: 62% 151.2kg/y: Population 805,888
2 Availability: White Rice	36,771	9,683	4,503	5,789	1,287	0	0	0	3,623	9,057	15,387	47,904	134,004	
3 Demand of Rice	10,349	9,347	10,349	10,015	10,349	10,015	10,349	10,349	10,015	10,349	10,015	10,349	121,850	
4 Surplus, deficit: Rice	26,422	336	-5,846	-4,226	-9,062	-10,015	-10,349	-10,349	-6,392	-1,291	5,371	37,555	12,154	
5 Cumulative of s/d	26,422	26,758	20,912	16,686	7,624	-2,391	-12,740	-23,089	-29,481	-30,773	-25,401	12,154		

Table A.3 (10/10) Monthly Balance of Rice by Province

05 Kampong Spueu

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Harvested Area (ha)	Production (ton)	Remarks
1 Wet/Early Rice (ton)										10% 4,181	90% 37,628		23,099	41,809	
3 Wet/Medium Rice											50% 42,328	50% 42,328	46,771	84,655	
4 Wet/Upland													0	0	
5 Wet/Late Rice	50% 13,062											50% 13,062	14,433	26,124	
6 Wet/Floating Rice													0	0	
sub-total:													84,303	152,588	
7 Dry Season Rice			10% 280	90% 2,520									1,000	2,800	
Total:	13,062	0	280	2,520	0	0	0	0	0	4,181	79,956	55,389	85,303	155,388	

Source: (1) Crop Calendar: Provincial Department of Agriculture
 (2) Area, Production: WFP Commune Database
 (3) Percentage of Harvesting: Department of Agronomy, MAFF

Monthly Surplus or Deficit

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
1 Availability: Paddy	10,841	0	232	2,092	0	0	0	0	0	3,470	66,363	45,973	128,972	Seed: 10%, Loss: 5%, Feed: 2%
2 Availability: White Rice	6,722	0	144	1,297	0	0	0	0	0	2,151	41,145	28,503	79,963	Milling recovery: 62%
3 Demand of Rice	8,102	7,318	8,102	7,841	8,102	7,841	8,102	8,102	7,841	8,102	7,841	8,102	95,395	151.2kg/y: Population 630,917
4 Surplus, deficit: Rice	-1,380	-7,318	-7,958	-6,544	-8,102	-7,841	-8,102	-8,102	-7,841	-5,951	33,305	20,401	-15,432	
5 Cumulative of s/d	-1,380	-8,698	-16,656	-23,200	-31,302	-39,143	-47,245	-55,347	-63,187	-69,138	-35,833	-15,432		

Table A.4 (1/5) District-wise Balance of Rice (1999/2000)

Phnom Penh (Plain Region)

Disrtrict	No. of H.H.	Supply of Rice							Demand of Rice			Balance
		Paddy Production			Seed Req't	P.H. Loss	Availability		Population	Per capita Demand	Total Demand	
		Area (ha)	Yield	Production			Paddy	Rice				
1 Chamkar Mon	32,366								196,988	0.1512	29,785	
2 Doun Penh	22,203								138,898	0.1512	21,001	
3 Prampir Meakkakra	16,529								101,285	0.1512	15,314	
4 Tuol Kouk	26,198								163,173	0.1512	24,672	
5 Dangkao	17,565								97,357	0.1512	14,720	
6 Mean Chey	27,443								165,431	0.1512	25,013	
7 Ruessei Kaev	31,374								189,611	0.1512	28,669	
Total	173,678	8,730	1.39	12,110	873	1,186	10,051	6,232	1,052,743		159,175	-152,943

Kandal (Plain Region)

Disrtrict	No. of H.H.	Supply of Rice							Demand of Rice			Balance
		Paddy Production			Seed Req't	P.H. Loss	Availability		Population	Per capita Demand	Total Demand	
		Area (ha)	Yield	Production			Paddy	Rice				
1 Kandal Stueng	16,212	13,711	1.90	26,085	1,371	3,063	21,651	13,423	80,633	0.1512	12,192	1,232
2 Kien Svay	28,535	4,581	3.11	14,247	458	1,964	11,825	7,332	156,274	0.1512	23,629	-16,297
3 Khsach Kandal	20,877	10,193	3.05	31,072	1,019	4,263	25,790	15,990	110,966	0.1512	16,778	-788
4 Kaoh Thum	25,666	13,046	3.11	40,602	1,305	5,598	33,700	20,894	143,828	0.1512	21,747	-853
5 Leuk Daek	9,811	5,012	3.97	19,908	501	2,883	16,524	10,245	55,803	0.1512	8,437	1,807
6 Lvea Aem	12,728	5,380	3.03	16,287	538	2,231	13,519	8,382	69,348	0.1512	10,485	-2,104
7 Mukh Kampul	14,740	2,589	2.88	7,470	259	1,011	6,201	3,844	81,589	0.1512	12,336	-8,492
8 Angk Snuol	16,974	11,742	1.53	17,926	1,174	1,873	14,879	9,225	93,666	0.1512	14,162	-4,937
9 Ponhea Lueu	17,923	9,624	2.60	25,020	962	3,291	20,767	12,875	100,161	0.1512	15,144	-2,269
10 S'ang	32,457	14,949	3.08	46,112	1,495	6,344	38,273	23,729	178,852	0.1512	27,042	-3,313
11 Ta Khmau	10,266	697	2.30	1,599	70	202	1,327	823	61,373	0.1512	9,280	-8,457
Total	206,189	91,523	2.69	246,331	9,152	32,724	204,455	126,762	1,132,491		171,233	-44,471

Table A.4 (2/5) District-wise Balance of Rice (1999/2000)

Prey Veang (Plain Region)

Disrtrict	No. of H.H.	Supply of Rice							Demand of Rice			Balance
		Paddy Production			Seed Req't	P.H. Loss	Availability		Population	Per capita Demand	Total Demand	
		Area (ha)	Yield	Production			Paddy	Rice				
1 Ba Phnum	15,317	22,492	1.79	40,246	2,249	4,593	33,404	20,711	75,521	0.1512	11,419	9,292
2 Kamchay Mear	15,002	28,523	1.87	53,198	2,852	6,191	44,154	27,376	75,123	0.1512	11,359	16,017
3 Kampong Trabaek	22,364	46,059	2.06	94,678	4,606	11,489	78,583	48,721	112,293	0.1512	16,979	31,743
4 Kanhchriech	12,091	26,405	2.07	54,680	2,640	6,655	45,384	28,138	59,053	0.1512	8,929	19,209
5 Me Sang	19,683	28,658	1.87	53,451	2,866	6,221	44,364	27,506	97,332	0.1512	14,717	12,789
6 Peam Chor	11,824	5,818	1.85	10,735	582	1,243	8,910	5,524	69,989	0.1512	10,582	-5,058
7 Peam Ro	12,299	1,907	1.50	2,851	191	294	2,366	1,467	66,955	0.1512	10,124	-8,657
8 Pea Reang	22,225	34,605	2.00	69,263	3,460	8,314	57,488	35,643	113,771	0.1512	17,202	18,441
9 Preah Sdach	20,865	33,700	1.65	55,625	3,370	6,086	46,169	28,625	112,192	0.1512	16,963	11,661
10 Prey Veang	18,829	36,155	2.00	72,427	3,616	8,697	60,114	37,271	91,613	0.1512	13,852	23,419
11 Kampong Leav	10,918	9,222	1.83	16,855	922	1,943	13,989	8,673	58,019	0.1512	8,772	-99
12 Sithor Kandal	12,768	26,765	1.99	53,371	2,677	6,397	44,298	27,465	65,124	0.1512	9,847	17,618
Total	194,185	300,308	1.92	577,380	30,031	68,124	479,225	297,120	996,985		150,744	146,376

Kampong Cham (Plain Region)

Disrtrict	No. of H.H.	Supply of Rice							Demand of Rice			Balance
		Paddy Production			Seed Req't	P.H. Loss	Availability		Population	Per capita Demand	Total Demand	
		Area (ha)	Yield	Production			Paddy	Rice				
1 Batheay	17,541	24,068	2.54	61,076	2,407	7,976	50,693	31,429	95,849	0.1512	14,492	16,937
2 Chamkar Leu	24,338	8,897	2.18	19,436	890	2,414	16,132	10,002	132,685	0.1512	20,062	-10,060
3 Cheung Prey	14,562	16,180	2.25	36,356	1,618	4,563	30,175	18,709	78,917	0.1512	11,932	6,776
4 Dambae	9,738	12,548	2.00	25,056	1,255	3,005	20,797	12,894	54,450	0.1512	8,233	4,661
5 Kampong Cham	8,236	64	2.68	171	6	23	142	88	47,813	0.1512	7,229	-7,141
6 Kampong Siem	18,884	5,542	2.90	16,068	554	2,177	13,336	8,269	104,426	0.1512	15,789	-7,521
7 Kang Meas	17,661	8,077	3.50	28,305	808	4,004	23,493	14,566	96,157	0.1512	14,539	27
8 Kaoh Soutin	14,187	1,779	3.23	5,748	178	799	4,771	2,958	74,503	0.1512	11,265	-8,307
9 Krouch Chhmar	18,982	8,660	2.74	23,719	866	3,166	19,687	12,206	105,100	0.1512	15,891	-3,685
10 Memot	21,775	13,240	2.07	27,464	1,324	3,345	22,795	14,133	117,329	0.1512	17,740	-3,607
11 Ou Reang Ov	16,940	16,721	1.64	27,348	1,672	2,977	22,699	14,073	87,295	0.1512	13,199	874
12 Ponhea Kraek	24,261	21,198	1.92	40,627	2,120	4,787	33,720	20,907	130,595	0.1512	19,746	1,161
13 Prey Chhor	24,892	21,787	2.56	55,847	2,179	7,315	46,353	28,739	134,605	0.1512	20,352	8,387
14 Srei Santhor	18,224	15,625	2.41	37,716	1,563	4,849	31,304	19,409	96,740	0.1512	14,627	4,782
15 Stuong Trang	20,996	8,461	2.35	19,917	846	2,540	16,531	10,249	113,249	0.1512	17,123	-6,874
16 Tboung Khmum	41,624	17,529	2.06	36,081	1,753	4,381	29,947	18,567	226,423	0.1512	34,235	-15,668
Total	312,841	200,374	2.30	460,935	20,037	58,322	382,576	237,197	1,696,135		256,456	-19,258

Table A.4 (3/5) District-wise Balance of Rice (1999/2000)

Svay Rieng (Plain Region)

Disrtrict	No. of H.H.	Supply of Rice						Demand of Rice			Balamce	
		Paddy Production			Seed Req't	P.H. Loss	Availability		Population	Per capita Demand		Total Demand
		Area (ha)	Yield	Production			Paddy	Rice				
1 Chantrea	9,035	19,561	0.94	18,307	1,956	1,156	15,194	9,421	47,917	0.1512	7,245	2,176
2 Kampong Rou	13,205	27,640	1.99	55,080	2,764	6,600	45,716	28,344	64,849	0.1512	9,805	18,539
3 Rumduol	10,150	25,308	1.43	36,158	2,531	3,616	30,011	18,607	52,077	0.1512	7,874	10,733
4 Romeas Haek	22,077	28,762	1.48	42,540	2,876	4,356	35,309	21,891	117,585	0.1512	17,779	4,112
5 Svay Chrum	27,387	45,315	1.75	79,152	4,531	8,924	65,696	40,732	136,639	0.1512	20,660	20,072
6 Svay Rieng	4,112	1,065	2.46	2,616	106	338	2,171	1,346	22,361	0.1512	3,381	-2,035
7 Svay Teab	12,278	30,228	1.09	33,024	3,023	2,591	27,410	16,994	62,903	0.1512	9,511	7,483
Total	98,244	177,878	1.50	266,877	17,788	27,581	221,508	137,335	504,331		76,255	61,080

Takaev (Plain Region)

Disrtrict	No. of H.H.	Supply of Rice						Demand of Rice			Balamce	
		Paddy Production			Seed Req't	P.H. Loss	Availability		Population	Per capita Demand		Total Demand
		Area (ha)	Yield	Production			Paddy	Rice				
1 Angkor Borei	8,483	13,234	3.22	42,603	1,323	5,919	35,361	21,924	47,420	0.1512	7,170	14,754
2 Bati	22,550	26,443	2.29	60,615	2,644	7,660	50,310	31,192	119,861	0.1512	18,123	13,069
3 Bourei Cholsar	4,583	17,957	3.01	53,990	1,796	7,383	44,812	27,783	25,787	0.1512	3,899	23,884
4 Kiri Vong	18,455	29,742	2.30	68,287	2,974	8,635	56,678	35,140	97,462	0.1512	14,736	20,404
5 Kaoh Andaet	8,899	21,604	2.21	47,741	2,160	5,955	39,625	24,567	48,127	0.1512	7,277	17,291
6 Prey Kabbas	16,764	24,999	2.90	72,511	2,500	9,827	60,184	37,314	90,539	0.1512	13,690	23,625
7 Samraong	20,248	25,925	2.10	54,371	2,593	6,651	45,128	27,979	106,959	0.1512	16,172	11,807
8 Doun Kaev	7,257	7,220	3.14	22,679	722	3,133	18,824	11,671	41,312	0.1512	6,246	5,424
9 Tram Kak	28,826	33,513	1.64	54,862	3,351	5,975	45,536	28,232	151,847	0.1512	22,959	5,273
10 Treang	18,965	34,464	2.24	77,231	3,446	9,683	64,101	39,743	103,724	0.1512	15,683	24,060
Total	155,030	235,102	2.36	554,890	23,510	70,821	460,559	285,546	833,039		125,955	159,591

Table A.4 (4/5) District-wise Balance of Rice (1999/2000)

Kampong Chhnang (Tonle Sap Region)

Disrtrict	No. of H.H.	Supply of Rice							Demand of Rice			Balance
		Paddy Production			Seed Req't	P.H. Loss	Availability		Population	Per capita Demand	Total Demand	
		Area (ha)	Yield	Production			Paddy	Rice				
1 Baribour	10,418	15,182	1.71	25,939	1,518	2,891	21,529	13,348	54,252	0.1512	8,203	5,145
2 Chol Kiri	4,918	2,793	2.25	6,281	279	788	5,213	3,232	29,803	0.1512	4,506	-1,274
3 Kampong Chhnang	7,692	627	2.56	1,602	63	210	1,330	824	43,918	0.1512	6,640	-5,816
4 Kampong Leaeng	6,955	7,110	1.55	11,000	711	1,159	9,130	5,660	39,364	0.1512	5,952	-291
5 Kampong Tralach	14,422	14,972	1.71	25,648	1,497	2,863	21,288	13,198	78,500	0.1512	11,869	1,329
6 Rolea B'ier	17,157	24,822	1.64	40,692	2,482	4,435	33,774	20,940	85,443	0.1512	12,919	8,021
7 Sameakki Mean Chey	11,660	16,044	1.49	23,919	1,604	2,462	19,853	12,309	60,207	0.1512	9,103	3,206
8 Tuek Phos	9,416	12,311	1.56	19,219	1,231	2,036	15,952	9,890	48,391	0.1512	7,317	2,573
Total	82,638	93,861	1.64	154,300	9,386	16,845	128,069	79,403	439,879		66,510	12,893

Bat Dambang (Tonle Sap Region)

Disrtrict	No. of H.H.	Supply of Rice							Demand of Rice			Balance
		Paddy Production			Seed Req't	P.H. Loss	Availability		Population	Per capita Demand	Total Demand	
		Area (ha)	Yield	Production			Paddy	Rice				
1 Banan	16,404	22,606	1.70	38,468	2,261	4,279	31,928	19,795	89,823	0.1512	13,581	6,214
2 Bat Dambang	21,615	4,346	1.80	7,808	435	893	6,480	4,018	123,019	0.1512	18,600	-14,583
3 Svay Pao	25,584	41,151	2.56	105,237	4,115	13,775	87,347	54,155	147,425	0.1512	22,291	31,864
4 Bavel	14,849	20,860	2.04	42,652	2,086	5,165	35,401	21,949	83,248	0.1512	12,587	9,362
5 Aek Phnum	12,494	2,592	1.42	3,674	259	365	3,050	1,891	68,895	0.1512	10,417	-8,526
6 Moung Ruessei	25,588	67,782	1.62	110,010	6,778	11,924	91,309	56,611	141,542	0.1512	21,401	35,210
7 Rotonak Mondol	4,794	2,754	1.46	4,016	275	407	3,333	2,067	25,194	0.1512	3,809	-1,743
8 Sangkae	19,837	23,364	1.97	45,995	2,336	5,483	38,176	23,669	111,932	0.1512	16,924	6,745
9 Samlout		0	0.00	0	0	0	0	0	0	0.1512	0	0
10 Sampov Lun	1,940	0	0.00	0	0	0	0	0	13,185	0.1512	1,994	-1,994
11 Phnum Proek	2,751	0	0.00	0	0	0	0	0	16,174	0.1512	2,445	-2,445
12 Kamrieng	2,500	0	0.00	0	0	0	0	0	14,973	0.1512	2,264	-2,264
Total	148,356	185,454	1.93	357,860	18,545	42,291	297,024	184,155	835,410		126,314	57,841

Table A.4 (5/5) District-wise Balance of Rice (1999/2000)

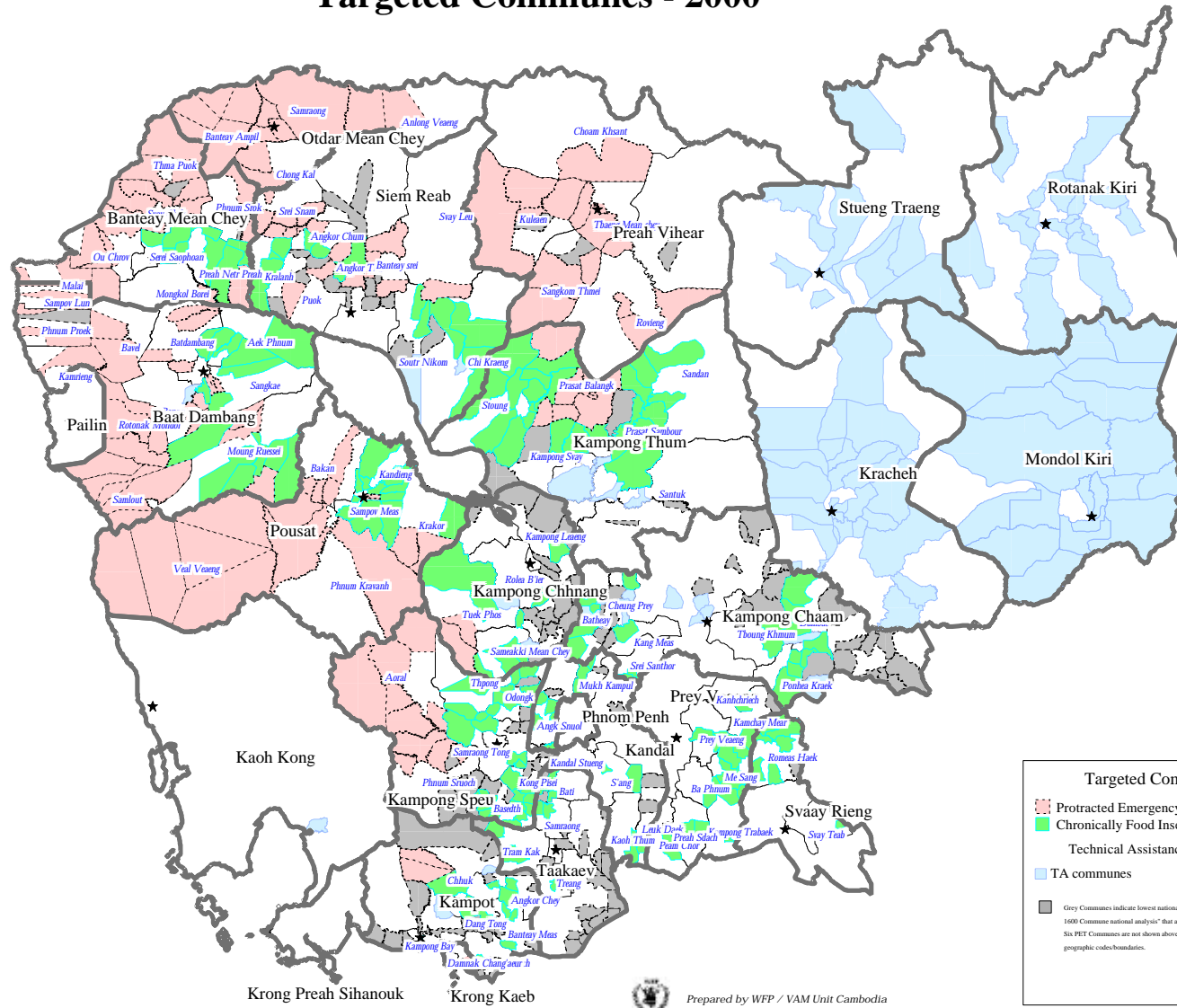
Siem Reab (Tonle Sap Region)

Disrtrict	No. of H.H.	Supply of Rice							Demand of Rice			Balance
		Paddy Production			Seed Req't	P.H. Loss	Availability		Population	Per capita Demand	Total Demand	
		Area (ha)	Yield	Production			Paddy	Rice				
1 Angkor Chum	9,091	19,573	1.14	22,243	1,957	1,824	18,462	11,446	56,116	0.1512	8,485	2,961
2 Angkor Thum	3,162	2,495	1.12	2,786	250	224	2,312	1,434	20,548	0.1512	3,107	-1,673
3 Banteay Srei	5,936	7,078	1.27	8,980	708	819	7,454	4,621	37,357	0.1512	5,648	-1,027
4 Chi Kraeng	19,811	40,098	1.42	57,067	4,010	5,692	47,366	29,367	123,548	0.1512	18,681	10,686
5 -	-	0	0.00	0	0	0	0	0	0	0.1512	0	0
6 Kralanh	10,651	27,556	1.26	34,718	2,756	3,146	28,816	17,866	65,886	0.1512	9,962	7,904
7 Puok	20,423	30,193	1.37	41,348	3,019	4,010	34,319	21,278	128,336	0.1512	19,404	1,873
8 -	-	0	0.00	0	0	0	0	0	0	0.1512	0	0
9 Prasat Bakong	9,720	13,666	1.42	19,462	1,367	1,942	16,154	10,015	62,660	0.1512	9,474	541
10 Siem Reab	20,985	6,718	1.42	9,567	672	955	7,941	4,923	138,367	0.1512	20,921	-15,998
11 Soutr Nikom	16,356	21,158	1.55	32,872	2,116	3,472	27,283	16,916	104,278	0.1512	15,767	1,149
12 Srei Snam	5,114	11,886	1.31	15,626	1,189	1,468	12,970	8,041	30,952	0.1512	4,680	3,361
13 Svay Leu	2,459	5,440	1.31	7,152	544	672	5,936	3,681	14,897	0.1512	2,252	1,428
14 Varin	3,507	6,528	1.31	8,583	653	806	7,124	4,417	22,942	0.1512	3,469	948
Total	127,215	192,390	1.35	260,404	19,239	25,030	216,135	134,004	805,888		121,850	12,154

Kampong Spueu (Plateu & Mountain Region)

Disrtrict	No. of H.H.	Supply of Rice							Demand of Rice			Balance
		Paddy Production			Seed Req't	P.H. Loss	Availability		Population	Per capita Demand	Total Demand	
		Area (ha)	Yield	Production			Paddy	Rice				
1 Basedth	21,288	18,750	2.02	37,784	1,875	4,548	31,361	19,444	114,460	0.1512	17,306	2,138
2 Chbar Mon	7,552	2,875	3.17	9,119	287	1,263	7,569	4,693	43,697	0.1512	6,607	-1,914
3 Kong Pisei	19,014	14,266	1.30	18,607	1,427	1,736	15,443	9,575	102,195	0.1512	15,452	-5,877
4 Aoral	3,362	3,595	2.15	7,721	359	953	6,409	3,973	16,506	0.1512	2,496	1,478
5 Odongk	18,825	14,802	1.87	27,628	1,480	3,216	22,931	14,217	105,110	0.1512	15,893	-1,675
6 Phnum Sruoch	14,698	9,152	2.02	18,468	915	2,224	15,328	9,504	78,644	0.1512	11,891	-2,387
7 Samraong Tong	22,464	17,468	1.50	26,186	1,747	2,705	21,734	13,475	124,462	0.1512	18,819	-5,343
8 Thpong	8,525	6,789	1.45	9,875	679	1,000	8,196	5,082	45,844	0.1512	6,932	-1,850
Total	94,440	87,698	1.77	155,388	8,770	17,646	128,972	79,963	630,917		95,395	-15,432

Targeted Communes - 2000



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