Farming and Flooding in Takeo – Responses to External Pressures

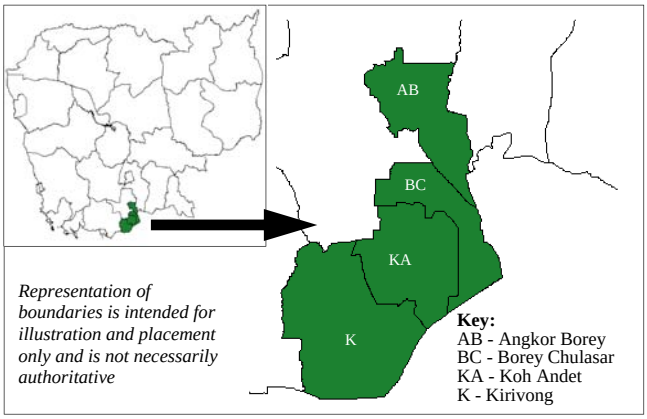
New research by Chamroeun Cheit Khmer (CCK) and Oxfam GB looks at the current agricultural situation in Takeo, and the changes that have occurred since the completion of the nearby dam in Vietnam. Sophie Bown, the research leader, summarises the main findings.

CCK is a Cambodian NGO based in Takeo, focusing on food security and disaster preparedness in four districts, namely Borey Chulasar, Kirivong, Angkor Borey and Koh Andet (see Map). Although the area is subject to flooding, the villagers usually experience a large flood only every 5 or 10 years. However, since 1999 large floods have occurred every year. Villagers attribute this unusual pattern of flooding to the construction of an irrigation dam located across the border in Vietnam. Constructed in stages, it seems that the dam was largely completed in 1999, and the final stages finished in 2000. The problematic flooding hence coincides with the completion of the dam: villagers reported that the flood in 2000 was the worst in living memory. In addition, the villagers assert that the type of flooding is different from that which they usually experience, with water rising faster than before, staying longer, and receding slower, a pattern consistent with the restriction of water movement by a dam.

During visits to the villages, it became apparent to CCK workers that problems caused by this unusually high flooding were seriously affecting agricultural activities in the area. Despite changing from wet to dry season rice to adapt to the flooding, many families were saying that they didn't have enough to eat. In order to identify the extent and nature of the impact the flooding was having on the population, and to recommend appropriate policy strategies, CCK implemented a systematic research project, supported by Oxfam GB. A team of local government and NGO researchers designed and carried out a Rapid Rural Assessment-based survey over a three week period in August 2003. Three villages in each of the four target districts were visited so participants could be sought for individual and group questionnaires. A total of 214 individual and 24 group interviews were conducted over a 12-day period. Due to the staggered nature of the dam's construction, participants were asked about their situation in the years 1998 and 2000. For the individual questionnaires, both comparatively rich and poor villagers were interviewed about their personal livelihood activities and income, their use of agricultural inputs, their level of debt and their level of food security. Group interviews focused on discussing the wider impact on the community, with an emphasis on uncovering the influence of gender on the experience of the floods.

This article briefly summarises the research findings; the full report will be presented in an upcoming Oxfam GB publication. The results indicate that responding to the floods by changing rice varieties has altered the amount and type of agricultural inputs purchased, caused an increase in the level of debt in the population, and has had negative repercussions on food and livelihood security in the area.

Map of Cambodia Showing the Four Target Districts in Takeo



Implications of a Change in Rice Cultivation

Takeo is a major rice-growing region - only two to three percent of agricultural land is used for non-rice products (Takeo Provincial Agricultural Office, personal communication). Although each village is unique in its experience, the general trend that emerged in interviews with the villagers is that before 1998 farmers predominantly grew wet season rice (WSR), but turned to dry season rice (DSR) in the wake of the recent floods. The most notable exception to this is Pak Dai village in Angkor Borey district, where farmers have grown only DSR since 1979. In some other villages a few farmers grew both rice varieties.

The succession of extreme floods from 1999 to 2002 destroyed much of the WSR crop each year in the affected districts, the amount destroyed varying between villages. This made it unfeasible, if not impossible, to continue to grow WSR: in many cases, farmers lost all their seed stock in the successive floods. When the floods receded, DSR was grown as a replacement. However, DSR is more costly to produce than WSR, requiring significantly higher levels of inputs (agro-chemicals, labour, irrigation) than WSR, which grows easily with very low levels of both labour and agro-chemical inputs, and which also has very little need for extra water, with only occasional introduction of irrigation towards the end of the season. Moreover, DSR fetches a lower price on the market as it is of a

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Table 1: The Change In Rice Cultivation, Degree of Market Participation and Relative Cost of Inputs For Interviewees in the Four Districts

Type of Cultivation	Average Yield/ha in kg	Percentage Respondents Cultivating[1]	Percentage Respondents Buying Inputs[1]	Percentage Respondents Selling a Proportion of Their Crop[1]	Percentage of Income from Rice Selling Spent on Agricultural Inputs
WSR (1998)	1661	72	39	40	21
DSR (1998)	3198	31	8	25	52
WSR (2000)	1367	18	18	6	-[2]
DSR (2000)	2926	82	79	71	119

(Total Number of Respondents = 214) [1] Numbers participating are expressed as a percentage of the total interviewees. Note: some interviewees grow both wet and dry season rice. [2] No satisfactory information was available, but figures up to 92% were recorded for farmers who managed to grow some WSR. This is because flooding destroyed part of the crop, decreasing profits.

lower quality than WSR (around 350 riels/kg compared to 380 or 400 riels/kg for WSR). This makes higher yields essential to recoup the costs of production.

Table 1 shows the change in cultivation in the study population and the average yields attained. The data show a drop in the proportion of farmers cultivating WSR from 72 percent in 1998 to 18 percent in 2000. Over the same period, there was an increase in the proportion of DSR growers, up from 31 percent to 82 percent. Although DSR yields were higher than for WSR in both 1998 and 2000, the average DSR yield actually shows a slight decrease from over 3000 kg/ha to just under 3000 kg/ha. This is most probably due to a large number of farmers taking up DSR out of necessity rather than choice: being inexperienced, many were unable to attain the higher yields that more experienced farmers can attain. However, problems with the supply of irrigation water were also identified: non-delivery or late delivery of water purchased from private water companies decreased DSR yields in several cases.

Looking at the percentage of respondents buying inputs for DSR, it is notable that in 1998 a far smaller proportion of farmers purchased inputs than in 2000. This is borne out by the comments of villagers in these areas who said that the need for inputs has increased dramatically over recent years due to an increased pest problem. A possible explanation given for this was inappropriate or excessive use of pesticides either in Cambodia or Vietnam, causing either resistance or migration of insect populations.

Table 1 also shows an increase in the number of farmers selling their rice for cash. In 1998, although 72 percent of farmers grew WSR, only 40 percent sold some or all of their crop. Thirty-two percent therefore did not sell any of the rice they grew, instead storing it as food for their family. At this time, inputs were generally only used if the crop was being grown for sale. Yields were low (on average 1661 kg/ha), but farmers reportedly made a comfortable living. In comparison, nearly all of the farmers growing DSR in 2000 found it necessary to buy inputs, and a greater proportion were selling their output than before. The research interviews indicated that this arose from their need to sell the rice crop in order to pay back debts accrued to cover the cost of inputs. One of the implications of the change in rice cultivation is therefore that many farmers have had to move into the cash economy, whereas before many would more accurately have been described as subsistence farmers. A further implication is that the type of inputs purchased and the amount spent on them has changed, altering the flow of money in the community.

Increasing Inputs

To compare the difference in input spending at different times and levels of agricultural intensification, the amount farmers spent on inputs each year is calculated as a percentage of their profits (final column, Table 1). In 1998, DSR farmers spent around 50 percent of their rice yield income on inputs, whereas WSR farmers spent only 20 percent. The figure for DSR farmers in 2000 is 119 percent. The problem facing the farmers is clear: they are currently spending more on inputs than they earn in profit, making a clear loss over the season, even before considering the impact of monthly loan repayments. In reality many farmers compensate for this loss with income from other activities such as livestock raising, but in the long-term DSR does not seem to be a viable proposition for most farmers unless productivity (i.e. ratio of costs to profits) improves.

The research indicates that DSR farmers in 2000 spent on average $180 per hectare on inputs (see Table 2). Unfortunately it was not possible to obtain reliable information on the cost of WSR inputs in 1998 as most farmers did not use inputs, and those that did were unable to recall costs accurately. However, it is clear from talking with them that covering the cost of inputs for WSR was not a problem for them. In the case of DSR, however, synthetic pesticides and chemical fertilisers have to be purchased, along with irrigation water and gasoline to operate the water pumps. Most

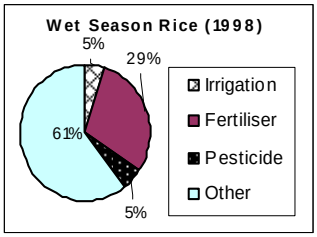
Table 2: Average spend per ha on DSR inputs, year 2000

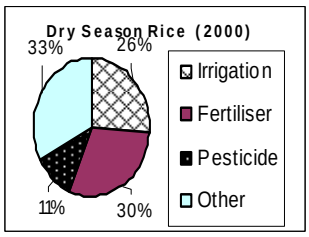
	Irrigation	Fertiliser	Pesticide	Other	Total
Cost per ha (in US$)	45.74	51.28	19.15	64.70	180.86

(Exchange rate: 4000r to $1)

Table 3: Percentage of Total Input Spending Going to Each Input Category (%)

Type of Cultivation	Irrigation	Fertiliser	Pesticide	Other
WSR (1998)	5	29	5	60
DSR (2000)	26	30	11	33





farmers mentioned the high cost of irrigation as a particular problem.

Contrasting WSR in 1998 and DSR in 2000 (i.e. the predominant type of agriculture in each of these periods), Table 3 shows the proportion of input spending allocated to each of four input categories - irrigation, fertiliser, pesticide, and 'other', representing hire of labour and machinery for harvesting purposes. The data show that the proportion of money being spent on pesticides and irrigation has increased, as would be expected, but the figures also indicate an almost 50 percent decrease in the proportion spent on labour and machinery hire. In other words, when cultivating WSR, at least $60 out of every $100 spent on inputs stayed in the local area, whereas for DSR the equivalent figure is only $33. This seems to indicate a significant opening up of the local economy, which could be detrimental to the local community. The situation could arise where, even though farmers are making more money in absolute terms, in reality the local community does not benefit as much as it could, since profits generated go to external water and agrochemical companies to pay for inputs. In this respect it is worth noting that a large part of the money spent on fertiliser for WSR was paid to local farmers for the purchase of manure, rather than to buy chemical fertiliser from agro-chemical companies, whereas DSR cannot grow without chemical fertiliser.

A Cycle of Debt

Since the series of severe annual floods destroyed or damaged the assets of many families, the only way most families could afford to buy the inputs necessary to grow DSR was by borrowing the initial investment. The research found that, although 65 percent of the families interviewed had never borrowed money before, 69% percent found it necessary to borrow at some point between 2000-2002. The average lump sum borrowed at first was equivalent to $1696. Many families paid back their debt by selling their rice harvest, but then had to borrow again to buy inputs for the next season. On average, families who had borrowed still owed $117 at the time of interview.

The average interest rate on the amounts borrowed was 15 percent per month, but interviewers observed that richer families usually secured more favourable terms, borrowing at a lower rate of 3.5 percent per month, while poorer families had to accept higher rates of 10-25 percent. On a loan of $169 this represents a difference in monthly repayments of $42.25 (25 percent rate) against $5.92 (3.5 percent rate). Over the standard three month season, that adds up to $126.75 for the higher rate compared to only $17.76 for the lower rate. If the money is borrowed for longer, monthly repayments continue to be paid. To clear the debt the full amount originally borrowed also has to be repaid, so total repayments of over 200 percent of the amount borrowed are easily accrued. In this way even farmers who are managing to keep their input spending below their profit levels can be making a loss if repaying high-interest loans.

Impact on Health and Nutrition

The food security of the interviewees has been jeopardised by the current situation. In particular, selling all their rice yield to repay loans meant that many families were then put in the position of having to buy rice. The research found that the average number of months per year in which families experience a food shortage has increased from just over one month per year in 1998, to four and a half months in 2000. Villages visited in Borey Chulasar district have been particularly badly hit, with an increase of nearly five months per year (see Table 4). The lack of food has hit women the hardest; practically all the women interviewed said they frequently ate less in order to give more to their husbands and children.

In times of want, villagers increasingly turn to 'free' sources of food and income such as fishing, catching crabs and snails, and collecting wild vegetables. Increased harvesting of these items could explain why many villagers reported a decrease in their availability. However the scarcity may in fact be due to the increased use of pesticides in the area, or, in the case of fish, caused by the use of illegal fishing methods, which farmers alleged are frequently employed by Vietnamese fishermen in the area.

Decreased nutrition has had predictable effects on health: many men mentioned that co-workers increasingly looked pale and weak and mothers said their children got sick more often. Another source of illness, especially diarrhoea, was the lack of clean water when villages were flooded and the village ponds and wells were filled with flood water. Additionally, the increased use of pesticides by relatively untrained and

Table 4: Average Food Shortage (Months / Year)

District	Pre 1998	Post 1998	Increase
BC Total	0.9	5.8	4.8
K Total	1.2	4.0	3.3
AB Total	1.2	3.9	2.9
KA Total	1.2	4.2	3.0
Overall Average	1.1	4.5	3.5

ill-equipped farmers appears to be having some serious immediate and long-term health impacts. The majority of farmers using pesticides cited effects such as dizziness, nausea, headaches and stomach aches, which they experienced during or after their use of the chemicals. Other more serious effects included vomiting, fatigue coupled with an inability to eat, and permanent or long-lasting changes in vision and speech. Health problems such as these can be expensive to deal with, and represent an extra financial burden and source of worry for many families.

Living with the Flood

As well as having to cope with the economic problems caused by the agricultural changes, villagers have had to cope with the physical difficulties that result from flooding. In some cases water levels were reported to rise to over half a metre inside the villagers' houses and remain there for a month. Loss of possessions including houses, death of animals through disease and even loss of human life have been recorded. This may be expected to some extent in extreme flood years but, as mentioned earlier, such flooding used to occur comparatively rarely and not on an annual basis as has happened in recent years.

Children's education often suffers extensively during times of flood, with schools closing for up to 5 months. Transport is a major problem when the area is flooded as roads are often cut off and the only way to travel is by boat, which villagers said was a very expensive way for those who do not have boats of their own. This problem of transport applies to everyday travel requirements, such as going to the market, finding animal fodder or even going to the toilet (for women), but it also increases the difficulty of reaching the hospital or health centre when medical attention is required. Participation in traditional cultural activities is also affected: lack of money and transport prohibited many villagers from visiting the pagoda on ceremony days. When they could go, villagers found it impractical to wear their traditional ceremonial clothes because of the weather and the need to travel by boat.

At the height of the flood season, fierce winds make it dangerous, and on occasion impossible to go outside. Villagers in Sangke Cheau and Anchanh, Borey Chulasar district, were confined to their houses for up to two weeks at a time each season. Restriction to a small area for a long period of time has caused some serious leg problems due to a lack of exercise. In a few cases, villagers could no longer walk normally. The danger of leaving the house makes it difficult to go outside to find food for the family or for the animals, and villagers often cannot venture out to share food with vulnerable neighbours. This can have tragic consequences; in Andong Samrith village two families were said to have died from a lack of food. In other cases, villagers have drowned in the stormy waters whilst out trying to gather food for the family.

The Result: Community Disintegration and Lack of Livelihood Security

The problems faced by the villagers over the last few years have already started to affect community solidarity. The widespread lack of money and food has raised tensions between husbands and wives and between neighbours as the necessity to borrow becomes ever more frequent. More long-term problems are the issues of decreasing food and livelihood security. As families slide into debt they are forced to sell their land, or give it up as payment to a moneylender; they then have no alternative but to work as labourers to earn money to buy rice, rather than growing their own. In the 12 villages surveyed, 151 families had already moved away to look for work elsewhere as migrant labourers. Many more villagers sought out seasonal work in other provinces. Husbands would often be away for months at a time, leaving their wives at home to care for the children. It was also becoming common for girls to be taken out of school and sent to work in Phnom Penh to find income as garment workers or domestic help.

When asked how they intended to cope with their problems of debt, most interviewees replied that they would try to sell enough labour (at $1.25/day) to pay back their debts. Many of them requested agricultural assistance in terms of irrigation or subsidies on inputs, and were keen to grow dry season rice if it were made financially viable. However, there was a small number of respondents who said they did not know how they would ever pay back the amount they currently owed.

Policy Recommendations

Provide support, particularly affordable irrigation, if villagers are to grow DSR

Current government policy is to grow more DSR as it is less vulnerable to flooding. District governors in Takeo have been encouraging this in areas that have the capability to grow dry rice. However, to do this villagers need more support in terms of irrigation and education on effective input use.

Look for lower cost methods of growing DSR

Levels of input spending could be reduced if agro-chemicals were replaced to a certain extent by labour. Organic rice-growing techniques such as SRI (System of Rice Intensification) are more labour intensive, use fewer inputs, and produce a high quality, high value rice yield. This fits in with current government policy of promoting 'pro-poor' or labour intensive production of goods for market.

Increase availability of low-interest credit

Money-lenders are exacerbating the problems faced by poor villagers by providing loans at high interest rates. Lower interest sources are available, such as from the European Commission funded PRASAC project, but the accessibility of this type of loan should be increased to support long-term growth of farmers' livelihoods.

Research ways to improve market access

Many villagers said they would like to sell their produce in a local market rather than taking it to Vietnam. A local market could be an effective mechanism for strengthening the local economy, and also help restore community cohesion. Crucially, improved market access should ensure farmers get a better deal when buying or selling goods.

Implement effective regulation of fishing methods
The issue of the use of illegal fishing techniques was particularly frustrating for law-abiding fishermen. Their natural resource base should be given effective protection to support the growth of the local economy.

Consider high level negotiations with respect to the dam
If the flooding problems continue and the dam in Vietnam is responsible, the issues should be discussed at governmental level as an infringement of sovereign rights. The Mekong River Commission has a mandate to arbitrate in these cases, although other organisations could potentially be involved, such as the UN.

Provide a safe area for people and animals
Until the issue is resolved, the villagers requested the urgent provision of safe areas for the people and their livestock to be used in times of flood.

(Continued from page 7)

Envisioning a New Paradigm of Development...

arrangements on the comparative advantage of a donor, including expertise and track record in the sector, as well as flexibility in timing and use of resources. Translated into concrete terms, the donor community as a whole could assign roles based on each donor's capacity, so that a lead donor could be effective in each of the critical sectors. A strong leadership role on the part of the RGC in this area would greatly facilitate the process.

Harmonisation is thus far the least explored area of partnership. Harmonisation of donor operational policies, including financial management and procurement, and of procedures and practices related to the aid cycle, would go a long way towards increasing efficiency and reducing transaction costs related to parallel management systems, inflexible procurement and inappropriate technical assistance, excessive demands of multiple missions on the time of key Cambodian officials, disbursement delays related to conditionality, and bureaucratic procedures, among others. On the benefit side, harmonisation leads to enhanced efficiency, strengthened local capacity and local systems, and facilitates stronger alignment and effectiveness. Ideally, the RGC must lead the harmonisation effort as well.

Conclusion

There is no shortage of knowledge on what is needed to transform the development partnership into a meaningful process of dialogue and effective cooperation. Today's development discourse reflects many of the principal elements of an effective partnership, genuine participation, and local ownership of the development process. While a number of recent initiatives of donor alignment of assistance and donor-donor coordination in Cambodia[4] are encouraging, evidence until now suggests a huge gap between rhetoric and actual practice. Changing donor behaviour, and implementing effective partnerships is hard work. The real question is whether there is within the donor community the commitment and capacity to change, and to envision in Cambodia a new paradigm of development cooperation.

Endnotes

1 RGC, CDC Ref: 1473/03 CDC/CRDB

2 Mysliwiec, 2003

3 The next three paragraphs are drawn from *CDRI's* study of technical assistance in Cambodia, *Godfrey et al.*

4 Joint economic and sector work by WB, ADB, DFID. Joint WB-ADB Integrated Fiduciary Assessment and Public Expenditure Review. Joint Staff Training on Partnership for Poverty Reduction (involving ten bilateral donors), World Bank Institute; Hanoi, September 2003.

Recommended reading

Council for the Development of Cambodia, 2000, *Building More Effective Partnerships for Development in Cambodia.*

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