Stung Chinit

Stung Chinit Irrigation & Rural Infrastructure Project

Main lessons learnt from project implementation

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Main lessons learnt from project implementation

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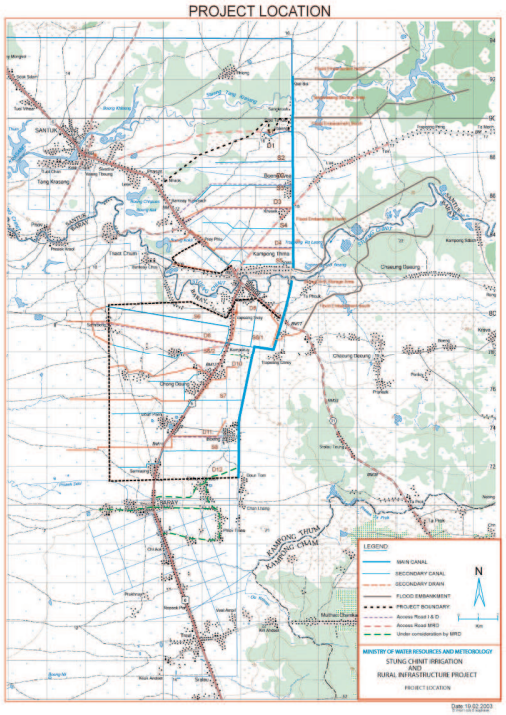
I - Historical perspective over the project

1.1 Initial scope of the project



Over the last decade, the Ministry Of Water Resources And Meteorology (MOWRAM) has put considerable effort towards one of the top priority of the Royal Government of Cambodia (RGC): the development of water management and irrigation infrastructures to enhance agricultural production.

In 1997, a study envisaged the feasibility of the rehabilitation of existing infrastructures developed under the Pol Pot Regime in Stung Chinit area. Because of insecurity in the project area, this feasibility study was carried out in a very superficial manner and its result was characterized by a lack of reliable essential data such as topography, soil and hydrology.

In 1999, RGC requested Asian Development Bank (ADB) and Agence Française de Développement to support the rehabilitation of existing infrastructures. Complementary socio-economic survey was carried out at the request of AFD, which confirmed that the farmers and local authorities were motivated and ready to organize themselves to manage water. On technical issues related to infrastructures rehabilitation, no further surveys were requested, and the initial scope of the project was defined as the rehabilitation of irrigation, drainage and access facilities. The objective was to provide supplementary irrigation to a command area of 7000 ha during the wet season, of which 30% could be irrigated during dry season.

The Stung Chinit Irrigation and Rural Infrastructure Project (SCIRIP) has been implemented from September 2001 to July 2008 with co-funding arrangements between ADB (16 Millions US$ on design and construction of infrastructure) and AFD (for institutional strengthening of FWUC) and RGC. Main components of the project were defined as:

1.- Formation of Water User Groups to manage and maintain the irrigation and drainage distribution network and improvement of farming methods (implemented by MOWRAM with AFD funding);
2.- Rehabilitation and development of irrigation and drainage infrastructures (implemented by MOWRAM with ADB funding);
3.- Development of access road and rural markets (implemented by MRD with ADB funding);

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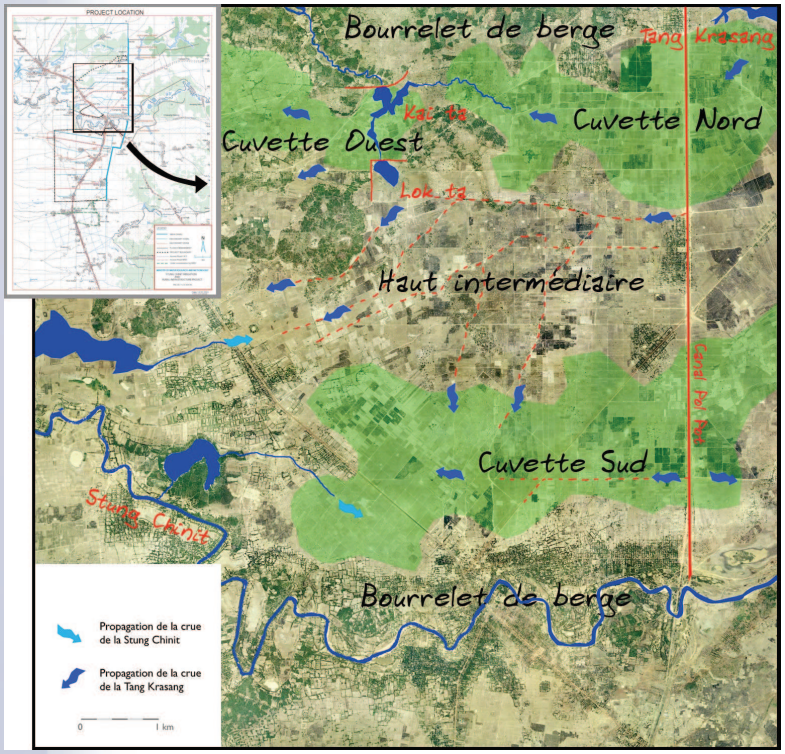
1.2 Social and agro-ecological context of Stung Chinit project



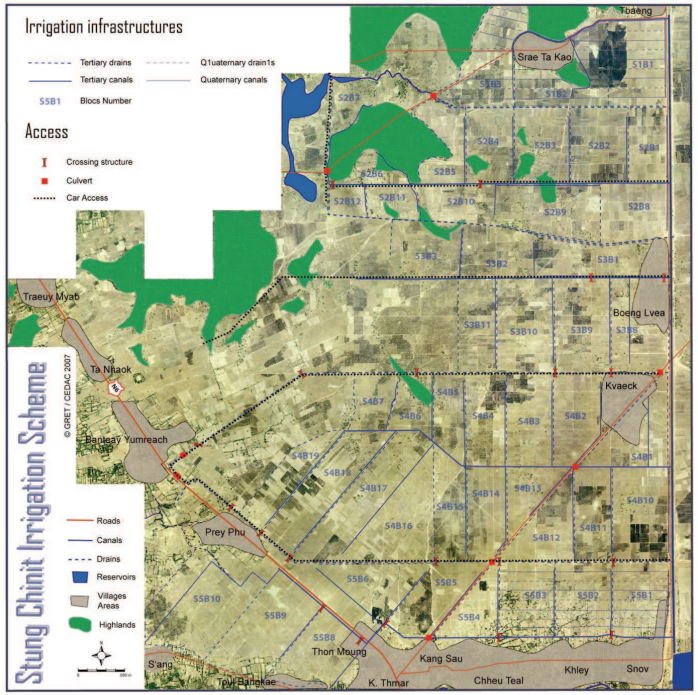
Located at the interface between lowland rice terraces and middle range rice terraces (*Sreu Kandal*), Stung Chinit area was traditionally characterized by agricultural practices aiming at the management of inundations of the two rivers bordering the project area: the Stung Chinit and the Tang Krasang rivers.

Farmers in this area were using a network of canal/drains to allow the expansion and the management of flooding water to allow the cultivation of traditional wet season rice. A large irrigation scheme developed under the Khmer Rouge regime was used to inundate 12000 to 15000 hectares located around the two rivers.

At the same time, traditional farming practices were characterized by complex articulation of different farming systems. Indeed, farmers were multiplying extensive farming activities in an effort to minimize risks. Cropping calendar was organized around multiple activities such as cultivation of floating rice and rainfed lowland rice, cattle raising and fishing, non-timber production. The importance of each of these activities in the revenue of farmers was closely related to the location of farmers' plots. In turn, location of plots originated from their redistribution after Khmer Rouge regime among the three commune boundaries. This led to very heterogeneous farming practices within the area of SCIRIP and subsequently diverse expectations from farmers concerning the development of irrigation network.

I - Historical perspective over the project

1.3 Initial phase of project implementation



The first phase of SCIRIP implementation was dedicated to detailed design and preliminary consultation with farmers. It showed that in most cases the condition of physical infrastructures was so poor as to be non-reparable. It also revealed that cost for rehabilitation had been largely underestimated. Therefore, main consultants in charge of design proposed various options to ADB and MOWRAM in July 2003. Decision was made to review the scope of the project: SCIRIP would allow delivering water to only 3000 ha out of the 7000 ha initially planned during the wet season and to 1800 ha during the Dry Season.

The technical model also drastically changed: the project would no more rehabilitate existing infrastructures, but rather apply a design of dense canal and drains system. This distribution network would allow the delivery of fixed discharged at plot level through a distribution schedule at quaternary level. From the beginning, the main argument of the consultant in charge of design to "sell the idea" to clients and donor was that this technical model proved to be efficient to reduce operation tasks in another context (Pakistan). There was little consideration for pre-existing farming and water management practices. Similarly, this change of scope was not decided on the basis of farmers' consultation and farmers' expectations.

I - Historical perspective over the project

1.4 Delay in works and first experimental cultivation season

The change of scope in design considerably delayed the delivery of irrigation service to farmers, initially planned in August 2004 and which was postponed to July 2006. In order to minimize the impact of delays on the creation and strengthening of Farmer Water User Community and on agricultural extension program, and meanwhile the whole scheme was developed, it was decided to deliver water to a 50 ha block pilot by pumping.

Unfortunately, this experiment revealed the problems caused by the sandy type of soils leading to excessive drainage and lixiviation. Additional constraints were quickly identified: extensive farming practices, other non-agricultural activities farmers, and historical context were additional adverse conditions challenging the development of more intensive irrigated agriculture and the improvement of yields in the pilot area.

In 2007, as the scheme had been completed, a first attempt to cultivate during the Dry Season was made in a pilot area of 80 ha, which was developed to be functional "as designed". Again, unfortunately, this experience showed that percolation from one plot to the next one due to sandy nature of soil would not allow a control of water level at plot level. Though plot boundaries had been constructed, plots located along the drains quickly dried out because of high percolation in the deeply dug drains. This season challenges the relevance of quaternary canals and showed that no water management was possible at plot level, therefore questioning the pertinence of the whole design.

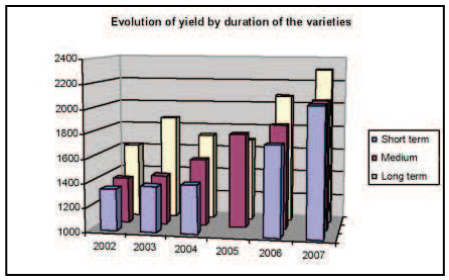
The whole scheme was finally handed over to MOWRAM by the contractors at the end of June 2008. Infrastructures developed are comprised of:

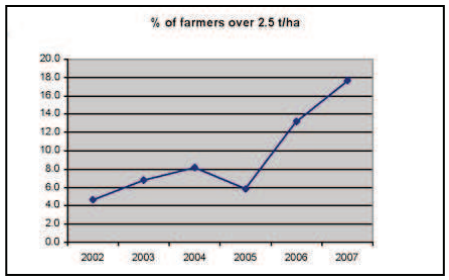
- A dam on Stung Chinit River with a maximum storage capacity of 7 740 000 m^3. This dam is also composed of a very long spillway (700 m) and a fish path to allow fish migrations
- A large and wide main canal more than 7km long, serving also as buffer water storage.
- 5 secondary canals delivering water to 48 blocks through a network of tertiary canals. Each secondary canal is equipped with a water gate at his head end, to allow adjustment of discharge, while every head end of tertiary canal is composed of a concrete open flume to deliver proportional amount of water to each bloc according to its area
- A drainage network to drain out excess of water

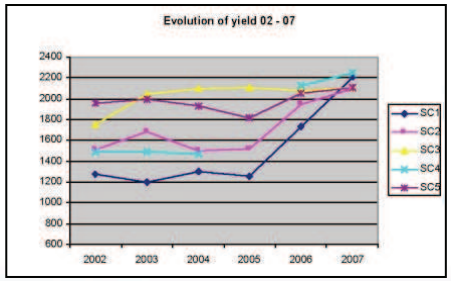
This irrigation and drainage network allows the control of water over an area of approximately 2000 ha, belonging to 2500 families.

I - Historical perspective over the project

1.5 A rapid and real impact on wet season rice yield







As soon as irrigation started in the whole area, one observed a gradual increase of yield (1.6 t/ha before irrigation, 1,9 t/ha in 2006, 2.2 t/ha in 2007). This improvement of the average yield is real for all kind of varieties, but the long-term varieties are giving a better yield. We observe that the use of the irrigation renews the interest of the farmer for the long-term varieties (without irrigation, the risk of a dry end of the wet season is a main constraint for the long term varieties). The number of farmers getting over than 2.5 tones / hectare is progressing, but not as much as we should have expected (is still less than 20 %).

The huger impact appears where the yields were bad (SC 1, 2 and 4). It is particularly true in the pilot blocs along the SC1 where farming extension activities were concentrated during the first 4 years of the project implementation (about 1.2 t/ha before 2005, 2.2 t/ha in 2007). But on the opposite, the water supply, even were it was correctly done, did not bring sensible improvement in the areas where the yield were already acceptable before the development of the scheme. Soil fertility and farming methods have to be seriously considered if we want to see a real take off of the yields in those areas.

II - Infrastructures Design and Construction Considerations

2.1 Design / conception

- ***Insufficient topographical survey***

The lack of reliable topographic data during the design process led to the exclusion of 400 ha (about 20% of the whole equipped area) from efficient service. High spots, which can not be reached by gravity, or on the contrary low fields where farmers are experiencing water logging that hamper cultivation resulting from insufficient consideration of the topographic differences in project area. It also led to an increase of the costs of the main infrastructures.

- ***Impact of soil quality***

The concept of the design that was proposed and adopted during the change of scope took little consideration of the sandy nature of soils in the project area. As in many instances in similar agro-ecological region (middle range rice terraces in the eastern part of Tonle Sap), soils are poorly suitable. They are characterized by a low level of organic content, low Cationic Exchange Capacity and high permeability.

In this pedological context, the excavation of drains led to the drainage and lixiviation of fields, thereby hampering any water management at plot level.

- ***Quaternary canals: impact on Operation costs***

The design was based on the development of a dense network of more than 150 km long quaternary canals and drains, to be constructed and managed by the farmers at bloc level. This mode of irrigation would have implied new mode of organization of farmers and the establishment of water turn which were poorly compatible with (1) extensive practices of farmers, (2) the cost induced by this mode of water distribution and (3) the dissemination of land tenure of farmers within the scheme.

II - Infrastructures Design and Construction Considerations

- ***Cost of Maintenance***

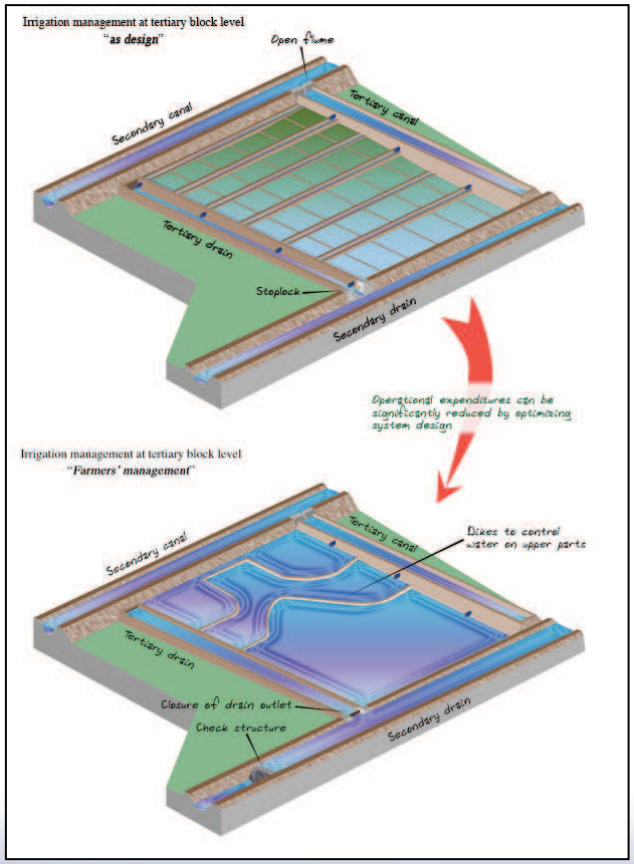
The Maintenance of infrastructures appears to be a major challenge to the sustainability of SCIRIP. High erosion of infrastructures was observed due to (1) poorly compacted drains and canals, (2) the technical choices made during the design, translating in secondary canals with high level above ground, and close to the drains, prone to high leaking and erosion risks, (3) high density of cattle migrating and (4) grazing in the area of the project and high permeability of soils. This important erosion of infrastructures resulted in high cost of maintenance. For the first year of scheme management, the total amount by FWUC was as high as 40 Millions Riels (10,000 US$), corresponding to a total expenditure of 5 US$/ha for tertiary structure only even though the distribution network was newly constructed.

- ***Capacity of local contractors and deficient construction supervision***

The infrastructures as designed by the international consultant company required a very high quality of infrastructures construction. Perfectly calibrated concrete flume, as well as “as designed” secondary canals’ topographic and transversal cross sections would deliver an exact and proportional flow to tertiary canals which would in turn respect the design cross sections. Unfortunately, local construction companies are far from having the technical know-how and the adequate technology to respect such high standards of construction. Topographical surveys carried out in 2006 revealed that none of the secondary canals were following design requirements. In addition, the supervision of work has proved to be deficient all over the construction period.

II - Infrastructures Design and Construction Considerations

2.2 Ability of farmers' infrastructure appropriation



- ***Irrigation and Drainage model: a new concept for farmers in project area***

As it was mentioned above, traditional agricultural practices were relying on the management of flood and the control of a water layer through a network of canals, which would serve also as drains when flood recedes. These practices are not restricted to Stung Chinit project area, but are common along the Tonle Sap and the low Mekong River basin. The separation between canals and drains network has been introduced as a new "technical package" in SCIRIP, with little consultation with farmers. First irrigation seasons confirmed the apprehension of farmers to see drainage system causing high losses of water through percolation and subsequent lixiviation. Interestingly enough, farmers had no choice but to limit this phenomenon by blocking the drains, thereby coming back to a more traditional way of flood expansion through canals and drains.

II - Infrastructures Design and Construction Considerations

- ***Multiple activities of farmers: major constraint to labour-intensive practices***

The multiple agricultural and non-agricultural activities of farmers in the project area can be considered as another constraint to the adoption of the technological package proposed by the project. Firstly, water distribution along quaternary canals requires a strong mobilization of labour, which is poorly compatible with the extensive modes of cultivation pre-existing in Stung Chinit area.

Besides, due to the impossibility to control water at plot level, farmers are obliged to harmonize their cropping calendar at block level. This harmonization is seriously hampered by the synchronous mobilization of labour in other farming systems in the area.

- ***Hydraulic v/s administrative boundaries: implication on farmers' mobilization***

As it is often observed in large "modern" irrigation schemes, the hydraulic boundaries of Stung Chinit infrastructures are not overlaying administrative boundaries of villages and communes. Secondary canals are commanding areas of several communes; tertiary canals are delivering water to several villages. In addition, most of the families own land located in more than one secondary canal command area. Thus, landowners in one single block were not showing any social cohesion on which could have been built a strong management of infrastructure. On the contrary, this resulted in difficult consultation with farmers at village level. Important decision such as location and construction of tertiary and quaternary canals thereby required the organization of large numbers of meeting in all villages covered by the respective infrastructures.

We should recognize that it would have been quite impossible to avoid such discrepancies between hydraulic and administrative boundaries. However, negative impact would have been limited by tracing the tertiary blocks along village boundaries.

III - Support to FWUC Creation & Strengthening

3.1 Sharing of responsibilities: Government / Farmers

- ***Sharing of responsibilities between farmers and government***

The sharing of responsibilities between stakeholders was identified from early stage: the government through its ministry, then through it provincial office, is focusing on the storage and management of the water and its fair sharing between the different communities. Its responsibilities include the operation and management of the reservoirs and the main canals and all related infrastructures. The management of the distribution networks (from secondary canals to all individual plots) was handed over to farmers, at the end of construction phase, through the set up of a water users' community.

- ***PDOWRAM and CRIC: emerging local actors***

Between the government level managing the water resource at national level, building storage structures and main canals and the farmers managing the water at local level, a need of coordination appears: adjustment of water level, maintenance and operation calendars. Considering the gaps, the first decision of the ministry was to hand over the operation and the maintenance of the main infrastructure to his local department. The SCTU was transferred to the PDOWRAM, and PDOWRAM assigned staff to Stung Chinit, but until now no means were allocated to allow a sustainable water management and the maintenance of the reservoir and related structures. During the transition period, and because of the AFD support, the FWUC is contributing for the routine cost of the main infrastructure.

Then, the CRIC (Chinit Reservoir Irrigation Committee) was created to facilitate the coordination between PDOWRAM and FWUC, but also to involve the commune councils and the district authorities in the steering of the overall management of the scheme. This committee has it own status, which clarify the sharing of responsibilities between PDOWRAM and FWUC, and it give responsibilities to the commune and district to support FWUC and PDOWRAM. It was approved by Deka from the provincial governor. In such a framework, the FWUC decided, for instance, to transfer to the commune the collection of the ISF. The CRIC proves to be a real support to the FWUC in the relation with the farmers, looking for more authorities, but also in the relation with the ministry, mobilising political supports. CRIC might play major role in the future raising fund from international aid for future development of the scheme.

III - Support to FWUC Creation & Strengthening

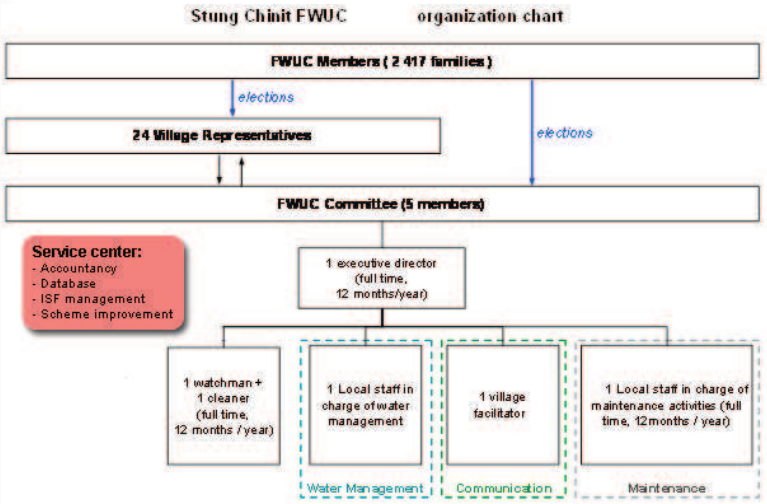
- ***Transfer of management or sharing of management?***

The process in Stung Chinit leads to sharing of management. The PDOWRAM, on behalf of the ministry will have to engage in effective support to the management of the main infrastructure.

This sharing of responsibilities should have been envisaged from the early beginning of the project: the ministry focused mainly on the development of the reservoir and main canal, when the local actors should have taken over the development of the distribution networks with some technical support (from PDOWRAM, for instance). A large consultation of the farmers was planed in the early step of the project to back the rehabilitation the scheme on it. But it failed, because the outputs of this consultation were considered as emerging from a “soft” component, whereas decision making on infrastructures design was largely relying on technical choices made by the “hard” component. The lack of coordination between these two components and the absence of one actor having an overview on the whole projects, further described below were also hampering the integration of farmers opinions in the technical design.

III - Support to FWUC Creation & Strengthening

3.2 The FWUC: a professionalized stakeholder



- ***FWUC structure***

The Stung Chinit FWUC structure is partly professionalized. It involved elected farmers' representative through an assembly of 24 villages representatives for decision making, steered by a board of 5 members as management committee, and a core team of 4 salaried staff, 15 block rangers and 4 permanent labourers.

The team was built following a long process of experimentation, and a smooth transfer of responsibilities from the project team to the FWUC. The project is now withdrawing his support, the current FWUC structure group competences and staff required for a full management of the scheme.

III - Support to FWUC Creation & Strengthening

- ***FWUC ability to take over his responsibilities***

Third campaign of wet season supplementary irrigation, the last wet season has proven that the FWUC team get the full management of the scheme in hand, for operation and for maintenance, the whole scheme was kept going during the entire campaign and arrive to the end with limited needs of periodic maintenances. Those maintenances was assessed and works done timely to prepare dry season campaign.

On the other hand collection of fees was collected successfully, with arrangement with local authorities.

The project team is now backing out his support from the operation and maintenance tasks. Further support is still required on more skilled tasks, more particularly those involving computerized tools: database of owners / members, billing of ISF, control of account, report to donors. The Project will continue to back up the FWUC, at their request through the delivery of specifics services. A monitoring and evaluation system was set up to follow and facilitate the progress of the FWUC's autonomy.

- ***Agreement on an Irrigation Services***

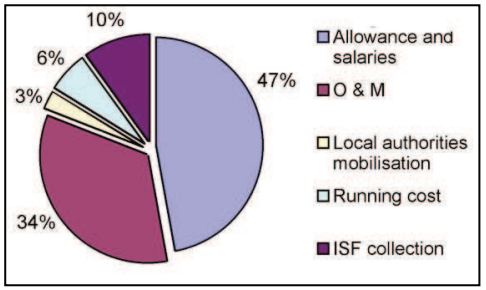
The set up of the FWUC structure result from the definition of an irrigation service the farmers are agreed to pay for. Long discussion was preliminary done to envisage the service to be delivered using the scheme as it was handed over by the ministry. How far has to go the management: secondary, tertiary, quaternary level? No pertinent service could be defined to be managed by the FWUC at the farmers expected price.

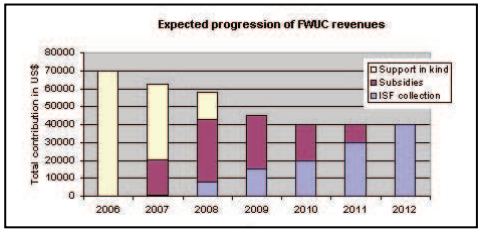
An agreement was finally reach, when we realized that the schemes have to be adapted to the services required by the farmers, and not the opposite: Providing supplementary water for wet season rice cropping, allowing farming of long term varieties, without any time consuming involvement of farmers. Therefore scheme infrastructures were reviewed to allow the management of a controlled flood. It makes the quaternary infrastructures useless, except in difficult topographical conditions, and focus the operation of the scheme on the drain management more than on the water supply system. The FWUC structure was built accordingly with a limited number of block rangers allowing a good control of the water almost everywhere.

We should have lost less time and money if the scheme was designed as such since the beginning.

III - Support to FWUC Creation & Strengthening

3.3 Budget, ISF and sustainable management





- ***Budget needs***

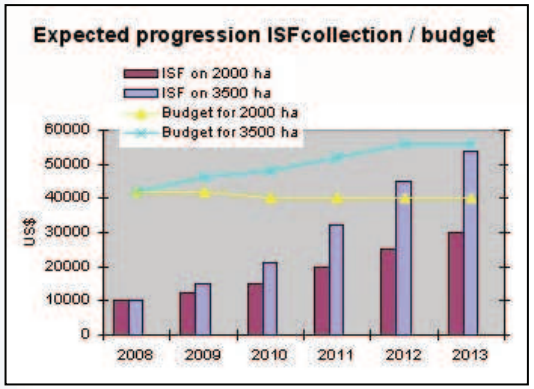
The current spending of the FWUC functioning is summarized below:

The management of the current scheme (2 000 ha) could be reduced to 40,000 US$, limiting the budget to the strict minimum required. Based on such plan, a first agreement was envisaged with the donors to support a gradually decreasing subsidize (40,000 US$ supported in 2008, 30 in 2009, 20 in 2010 and 10 in 2011).

Only a third of the budget is represented by O & M, half part of the budget is to support salaries and allowance the core structure. The cost of the structure is of course questionable, unless it is supported by subsidies. When farmers will have to pay for it, FWUC have to be ready to justify it!

From 2006 until now the expenses for scheme management was gradually reducing, gaining in efficiency, as shown in the figure. It was expected than in 2012 the FWUC will be able to manage the scheme mobilising only its own revenues, from ISF collection.

III - Support to FWUC Creation & Strengthening



- ***Irrigation service fees***

The ISF rate for 2007 campaign was set to 20,000 Riels and collected between January and August 2008. The total collected amounts to KHR 34 millions (US$8,500) and represents up to 85% of total amount billed and 95% of beneficiaries. The rate will be increased up to KHR 25,000 (US$6.25) per hectare in 2009 then should reach to KHR 60,000 (US$15) in 2013, according to farmers current thinking. These revenues are covering about 20% of the current expenses of the FWUC, and will cover about 75 % of the budget in 2013, at the current flow of expenditures for the same targets (2000 ha).

On order to cope with the expected financial gap, several solutions could be envisaged:

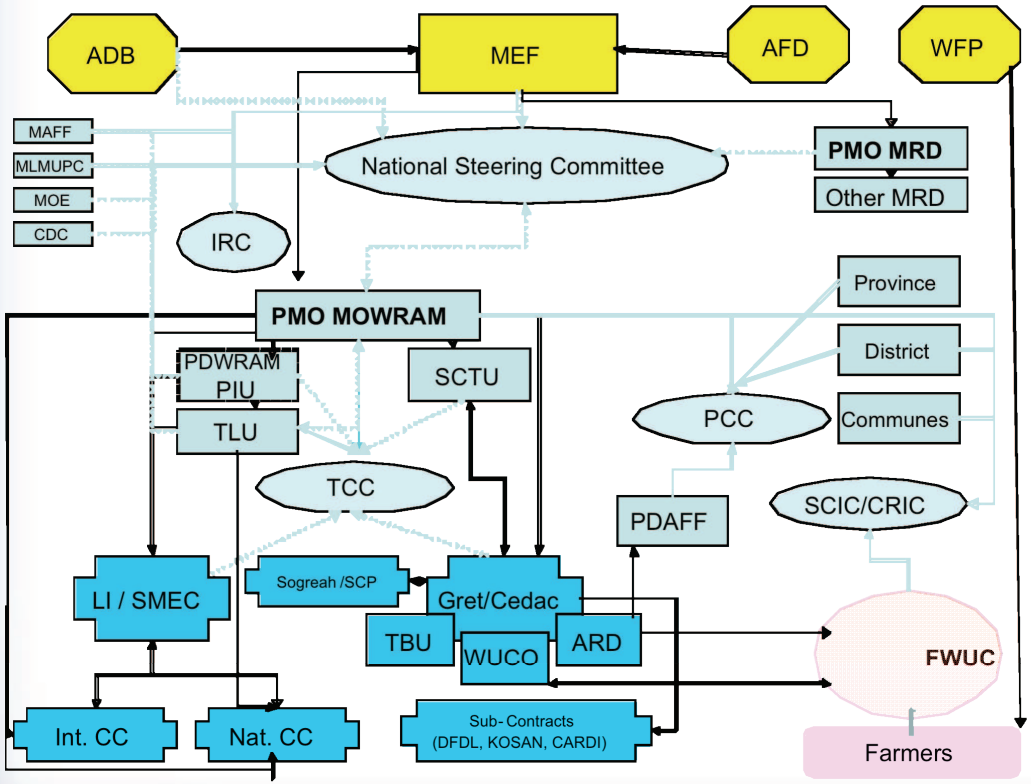
1.- Increased the areas of the scheme to increase the collection of the same ISF rate. The cost of the structure will not increase, only O&M and ISF collection. We could envisage to extend the scheme to 3,500 ha (actually a bit more than 400 ha in Banteay Yumreach, 400 ha additional could be envisaged, and 600 ha on the other side of the main canal). With a rate of 15 US$ per hectare the FWUC could balance it expenditure.

2.- An higher increase of the ISF rate: rice yield is increasing, dry season crop is developing, we could expect a real change in the farmer attitude toward farming practices in the next future dealing with an agreement on an higher increase of the ISF rate.

3.- Decrease the FWUC structure, and envisage the sharing of staff with others FWUC (director, farmer mobilization). A low cost scenario, based on voluntary board, could be envisaged, but because the risk of failure due to poor monitoring and coordination is important, it will not get the confidence of farmers and will not deal with farming practices improvement.

IV - Project Management & Institutional Considerations

4.1 Steering and coordination for large scale irrigation projects



- ***Complex project funding and implementation arrangements***

SCIRIP is a project that has been co-funded by two main donors, Asian Development Bank (ADB) and the French Agency for Development (AFD). These two main donors have funded different component of the project: ADB financed the design and construction of infrastructures and AFD funded "software" component of institutional capacity building for sustainable management. The institutional mechanisms of implementation are characterized by a large number of operators and stakeholders, and a complex distribution of responsibilities. Figure 1 is an attempt to present in simplified manner project implementation mechanisms.

IV - Project Management & Institutional Considerations

Coordination rapidly proved to be indispensable and several coordination platforms were set up. Unfortunately, these various coordination meetings were unable to compensate unclear responsibilities sharing and the fact that the two main teams in charge of design and construction on one hand and in charge of farmers consultation and FWUC creation and strengthening on the other hand had to respond to different donors, with different agendas. These resulted in an irremediable lack of dialog between the teams. It was also a serious obstacle to the consideration of farmers wishes and constraints in the process of designing the infrastructures.

- ***Difficult decision making by project implementer***

Facing the multiplicity of technical operators with different interests and viewpoint, providing different and sometimes contradictory advises, the Project Implementation Office of MOWRAM encountered difficulties to efficiently steer the project. In many instances, decision-making was postponed due to contradictory advices provided by the different operators and donors. No stakeholders had the necessary overview over the whole project implementation to be in a position to efficiently advise MOWRAM on technical and institutional choices.

IV - Project Management & Institutional Considerations

4.3 Pilot Project: interest and limits

Stung Chinit is one of the first rehabilitation projects, which started concomitant with the implementation of Participatory Irrigation Management and Development policy by MOWRAM. In 1999, the Circular n. 1 gave a preliminary policy and legal framework for the establishment of FWUC in order to sustain Operation and Maintenance of Irrigation Schemes. As such, Stung Chinit was considered as a pilot project and its results were supposed to feed the iterative development of PIMD.

The initial document had defined an innovative institutional arrangement for the management of the scheme, whereby a joint organization composed of PDWRAM and FWUC representatives would have been created to manage the scheme. This committee was actually never created for different reasons. First of all, it was recognized that the priority was to create and strengthen the FWUC. In an environment were irrigation was a newly introduced practices, building a farmer organization capable to manage water and maintain the infrastructures was already a challenging task. Besides, the discussion with MOWRAM rapidly revealed that the service responsible for PIMD implementation was not open to innovation related to FWUC. This service considered the existing legal framework promulgated by the Prime Minister as a relatively rigid framework to follow in institutional building. Finally, the structure FWUC that was created followed the standard statutes as presented in appendix of circular n. 1 and was recognized in 2006.

V - Conclusion

5.1 Necessity to take into consideration pre-existing farmers practices and agro-ecological/social context

One of the main lessons learnt during SCIRIP implementation is that preliminary steps of the project, i.e. project identification, pre-feasibility studies, topographic socio-economic and soils surveys are fundamental as they are key factors for success of the project. Insufficient evaluation of agro-ecological and socio-economic constraints at the inception phase of the project led to many complications in the course of its implementation. Worst designing and constructing infrastructures for which maintenance costs will be very high when compared to the added value brought by irrigation jeopardized the overall sustainability of irrigation scheme.

Any intervention in flooded plain of Cambodia shall also take into consideration the complex hydrology of the very flat lowland rice terraces. Flexible water management infrastructures would in most cases be more appropriate than properly speaking irrigation and drainage schemes.

5.2 Support to MOWRAM in project implementation

The whole project implementation suffered from a lack of coordination between different components, teams and donors involved in the project. Decision making was hampered by the multiplicity of stakeholders and the technical message was blurred by the interest of each of the parties. In further project design, it is recommended to make provision for assistance to MOWRAM project implementation office. The consultant in charge of assistance to project implementation shall have an overview on the project and be responsible for facilitating the supervision and coordination of its implementation.

V - Conclusion

5.3 Sharing of responsibilities

In a context where agricultural practices are mostly relying on subsistence farming, the State, Farmer Water User Communities and local authorities must share the responsibilities over the development and management of public irrigation infrastructures.

- ***For irrigation management:*** Ministry for storage and major infrastructures, more local stakeholders (communes, FWUC...) for distribution network

Another important lesson learnt is that all preliminary steps of the project, from the identification of the needs, the conception of the scheme, the supervision of the works as to be managed, at local level, by an *ad hoc* committee, grouping not only elected farmers representatives (a future FWUC), but also commune councils members and representative from traditional water managing system and PDOWRAM. We would propose that further project clearly separate (1) the **development of storage infrastructure, implemented by the ministry**, and (2) the **development of secondary networks, implemented under the supervision of locally set *ad hoc* committee**, with financial subsidies from state, commune et farmers contribution.

In such a hypothesis, projects supported by donors would be in a position to provide support (fund and TA) for both sides.

- ***Involvement of local authorities*** Ministry through PDWRAM O&M of main infrastructures, FWUC O&M of distributory network

The registration of the FWUC status has to be seen as a main step in the process to delegate **the management of the water distribution** scheme to the farmers. The preparation of the document should be an opportunity to define the scope of the sharing of management: The part of the infrastructure, for which the management will be delegated to the FWUC, the tasks of the farmers committee, the right to collect irrigation service fees is agreed on. With such status, agreed and signed by the minister offices, the farmers committee is empowered to manage secondary levels infrastructures. To get sense and to be well understood by the farmers, the completion of the scheme, the registration of the status and finally the hand over of the official stamp from the Ministry to the FWUC have to be synchronized. The status should not precise as it was requested in Stung Chinit detailed organisation chart and its functioning. They will be identified internally, through an iterative process, and formalized through internal regulations, to be submitted for approval during the first general assembly.

V - Conclusion

The stamp handing over ceremony is the beginning of a **transition period**, during which the FWUC will start appropriating the scheme, acquiring skill by doing required operation and management, with decreasing technical and financial supports from ministry, provincial department or projects. At the end, taking lessons from the transition period, a definitive **delegation of management of the secondary networks** should be agreed between farmers and government, involving required local agencies. A **Memorandum of Understanding** should be formulated and signed, ending the transitional phase, to clarify the modalities of the Sharing of management and the responsibilities of all parties.

This sharing appears relevant regarding maintenance needs and budgeting practices of ministries and farmers. Earth infrastructure request a day to day attention and the maintenance is mainly based on routine practices. The experiences in Stung Chinit show that a FWUC, locally based and mobilising easily farmers, could endorse such tasks with high efficiency. Big concrete infrastructures require on the opposite periodic attentions and the maintenance or repair could lead to heavy but exceptional works, fitting with the Royal Government budget management practices.

5.4 Involvement of local authorities in both development and management of irrigation scheme

During SCIRIP implementation process, the importance of the role of Local Authorities was recognized. Other field experiences (e.g. Prey Nup Polder Rehabilitation) Project, as well as several researches made on irrigation management in Cambodia (TWGAW, 2006, IWMI, 2006) led to similar conclusions.

The role of local authorities is particularly important with regard to (1) rule enforcement, (2) Irrigation Service Fee collection, (3) conflict resolution. Moreover, as it was noted above, local authorities such as communes could play a more important role in the design and development of irrigation infrastructures, particularly distribution networks.

The creation of CRIC proved to be an interesting pilot set-up to allow efficient involvement of Local Government Authorities. The experience of CRIC, though it still must be consolidated, can be regarded as one model to be adapted to local conditions in other schemes.

V - Conclusion

5.5 Redefinition of the role of the State

- ***During the project implementation***

The fact is that the build up of the Stung Chinit FWUC, except the registration process, was implemented with almost no support from the ministry; no way of coordination with it interested department (PIMD) was found. The project design involving GRET and CEDAC as operators acting directly with the communities, brought them to substitute the Ministry services, instead of building their capacities to do it by them-selves.

The question is therefore, how the MOWRAM could support the development of new FWUC? with which means? The experience has shown that it took times and skills.

In Stung Chinit a large part of the budget and times was mobilised to build the capacity of the supporting team (WUCO): How the ministry could from now take the best benefit from this well skilled teams?

Should the role of the ministry be limited to registration, and monitoring and evaluation? Should they contract NGO or any specialized organisations (Private companies or services providers) to do that with international funding?

- ***Post-project Financial and Technical support***

The need of a long term back up is clearly demonstrate in Stung Chinit: for sophisticated tasks, the need of extension services to support farmers in the adoption of new farmers techniques, technical and financial supports for improvement or extension of the scheme…

Long term subsidizing should be envisaged, because the viability of the water management is based on improvement of farming practices, which could be reached only when the sustainability of a relevant water management is already demonstrated to farmers and when market opportunities are created. It is a long process, and five years are certainly not enough, particularly in very poor sandy soil.

Is it possible for Government to subsidise irrigated agriculture through a long-term aid to FWUC to launch and make sustainable well managed irrigation system?

V - Conclusion

5.6 The emergence of specialized support services to FWUC

Considering on one hand the necessity of having long term support to FWUC beyond project duration and on the other hand the limited capacity of MOWRAM and PDWRAM to maintain supporting teams able to provide such day-to-day support, there is an institutional vacuum that was filed by the project supporting team during SCIRIP implementation. However, after project completion, Stung Chinit FWUC appears to still require such technical support, even though on more specialized tasks and on a less regular basis.

Besides, other FWUC at provincial and national level would require such support services. One of the solution envisaged to cope with this problem is the emergence of specialized support services at local level. These "FWUC service centre" would be providing on-demand technical advisory services to FWUC and would strengthen their capacities during the creation and the transition periods.

There are no antagonism between on one hand the State, responsible for developing water storage and large main canals and monitoring and evaluation of FWUC, and on the other hand local actors (local authorities, FWUC, FWUC Service Centres) who would contribute to the development and management of distributory network. On the contrary, such a proposal is taking advantage of the specificities of each stakeholders identified during SCIRIP implementation.

It is however of particular importance to note that in any case, sustainable development, operation and maintenance of irrigation schemes in Cambodia must be based on a partnership between Government and local stakeholders and require a consequent support to build the local capacity to improve current agricultural and water management practices. The intervention of donor in the sector shall aim at encouraging and supporting such collaboration.

Stung Chinit

Thank You...