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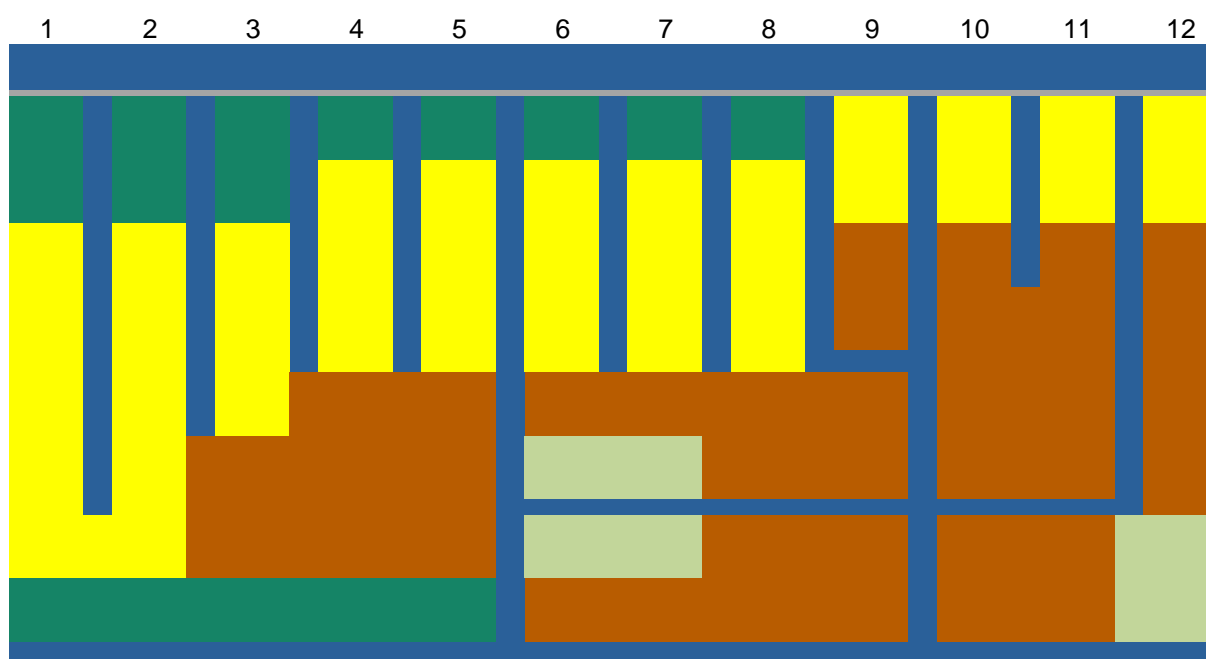
This report is for internal purpose and to be shared with participants of participatory working sessions organized by RUA/ISC/CIRAD/IRD within the framework of the DOUBT project (<http://deltasoutheastasia-doubt.com/>). It describes the objectives and dynamics of two ComMod working sessions organized on May 3<sup>rd</sup>, 2019 and May 7<sup>th</sup>, 2019 respectively.

The first working session brought together provincial level representatives of MoWRAM, MAFF (PDA and Fishery Administration), commune elected officials, and district (Koh Thom) representatives as well as researchers (World Fish) and representatives from donors (EU/AFD) (12 people participated to the working session). The second working session brought together farmers, village chiefs and commune level representatives and focused on describing the dynamics around Prek Ta Doung between Prek Thmei and Koh Thom Ka communes in Koh Thom district (10 people participated to the working session).

### *Objective and mechanics of the game*

The overall objective of the game is to discuss multiple development modalities and trajectories of the Prek Area in Kandal province and the trade-offs these may involve (both spatially and socially). The game also aims to test whether stakeholders depicts different development paths/trajectories in a situation with no interactions (round 1 of the game is meant to model sectoral thinking) and in a situation with interactions (round 2 of the game is meant at supporting more integrated and equitable thinking).

On the basis of the tools used during the first workshop held in December 2018, the “basis” of the game is a poster representing 12 (more or less connected) Preks and several types of land cover: (1) High Chamkar in dark green; (2) intermediate Chamkar (in yellow); (3) Boeung area (in brown) and (4) natural vegetation (in light green) (see picture/schematic below). The board is split in two communes with a limit located along the prek Number 6 (but not represented on the board). The importance of fisheries and the potential tradeoffs between agricultural development and fisheries resources has been reinforced compared to the working session of December 2018 whereby fisheries played hardly any role.<sup>1</sup>

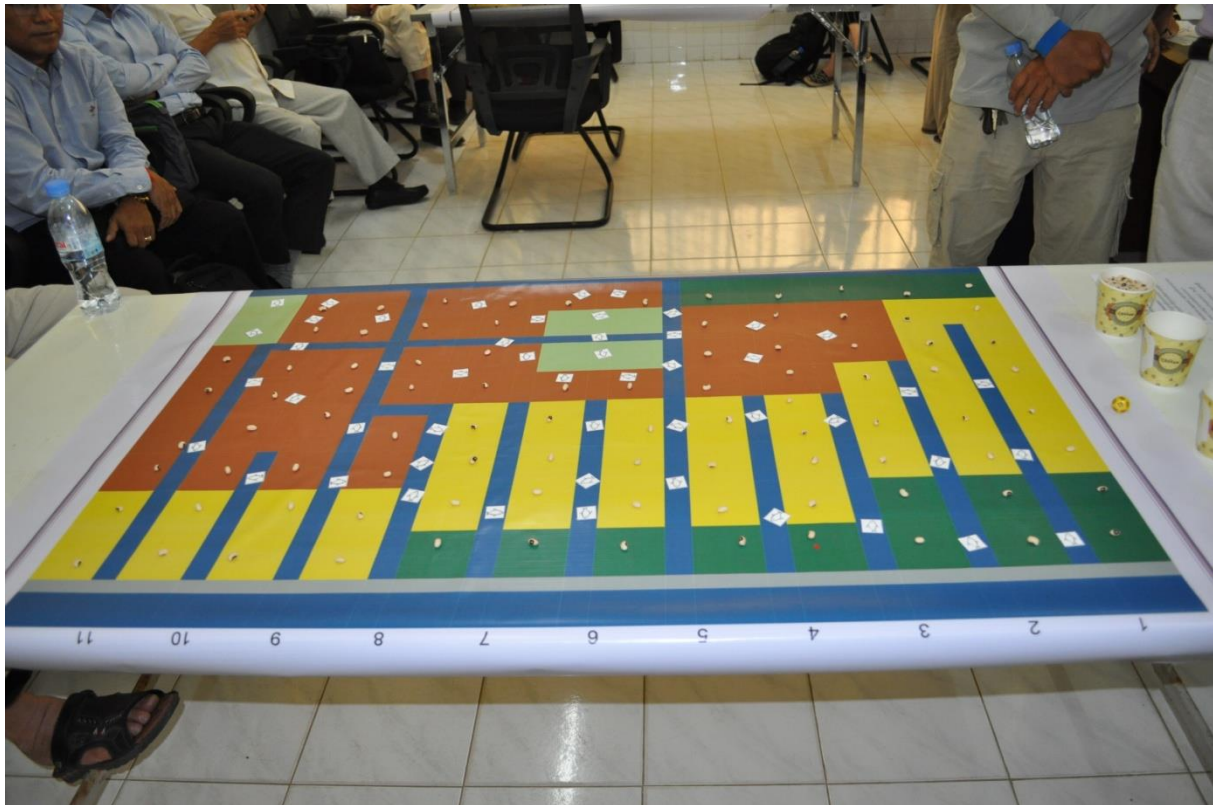


Players are attributed roles and have different objectives: (1) the representative of PDoWRAM is meant to limit flooding while still allowing a certain proportion of boeung to be flooded (for flood mitigation and soil fertility improvement); (2) the representative of PDA aims at increasing agricultural production both in Chamkar and Boeung; (3) the representative of the FiA aims at producing a certain amount of fish while preserving the resource and the

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<sup>1</sup> Before the game session started, there was a discussion on which area exactly the board was meant to represent. The group agreed that it represented the area between the Mekong and the Bassac. Like for farmers, participants needed “to ground” the board in a reality they knew.

area with natural vegetation;<sup>2</sup> (4) 2 commune representatives aim at improving livelihood in their commune and (5) a district representative responsible for ensuring livelihood improvement are balanced across the board. There are, hence, 6 players. The representative from PDoWRAM, PDA, FiA and the district can “play” on the entire board. The commune representatives can only play on the part of the board that represents their commune. The objectives are to be reached at “regional and or commune level”.



Roles can be attributed at random or to correspond to the “real position/job” of the actors, which was the option chosen during this working session to the extent it was possible.<sup>3</sup> Players are randomly attributed a number to determine the order in which they will play

To reach their objective, players have several possibilities represented by “Action Cards”: (1) installing pumping stations, (2) building sluice gates; (3) building a polder –each polder can cover the area located on each side of the prek, (4) facilitating the installation of an input seller, (5) promoting sustainable agricultural practices, (6) promoting individual fishing; (7) promoting collective fishing, (8) supporting commercial fishing and (9) clearing land. Each activity has an impact on 4 key indicators: (1) agricultural production in the Chamkar; (2)

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<sup>2</sup> A potential improvement of the game might be to create a role for the « environment », introducing a person who would be responsible to maintain a certain area of natural vegetation and preserve/enhance biodiversity (a role that was currently assumed by the fishery representative). The representative of World Fish notably questioned the “inclusiveness” of the game and wondered if roles had not been forgotten (such as land investors, merchants and traders – some of which were accounted for not as player but as action cards).

<sup>3</sup> No representative from PDoWRAM attended the workshop and there were 4 fishery experts.

agricultural production in the Boeung; (3) fish stock; (4) local satisfaction. The consequence of each of these actions on each indicator is adjusted in case of drought and flood.<sup>4</sup>

At the beginning of the game, each player is given 4 cards from a collective deck of card (of 24), and plays one card according to the number assigned. Once each player has played a card, the remaining three cards are passed on to the next player so that, at each round, every single player has a changing set of cards.

A player can make two moves: (1) play the card on the board – and the facilitator gives him/her a small wooden object representing the action that s/he positions on the board and (2) trump a card s/he is not interested in and does not want to be played during the game.

The facilitator “simulates” the impact on each card on the board (adding or withdrawing (1) beans to show potential changes in agriculture production; (2) fish stickers to show impact on fish stock and (3) marbles to show impact on satisfaction/happiness of the population (there is two glasses full of marbles –one for each commune- on the side of the board.

Once all cards have been played, the facilitator simulates the water regime (flood/droughts) through the means of a dice throw (results 1 to 3 represent a droughts; results 10 to 12 a flood) and adds/withdraws tokens accordingly. The remaining tokens (beans and fish stickers) are “harvested” by the players and if they have met their objectives, “happiness” marbles are added to the glasses. An excel file is used to model how results of the game session would have been affected by a flood and/or a drought so as to initiate a discussion on the resilience of the development options chosen by the different groups.<sup>5</sup>

The second round of the game proceeded the similarly apart from the fact that players were allowed to discuss with each others before playing any card (see results below).

#### *Results Group 1-- Round 1 (before any discussion)*

- They choose to put the polder at the extreme upstream of the board to protect the Chamkar because the Chamkar is “already high” and polders in Chamkar are less prone to be destroyed by floods as compared to a polder that would be put in the boeung. The choice is driven by the fact that building a polder in the chamkar will require less investment in case it is destroyed (and will cost more if it is in the boeung). This polder was played by PDoWRAM (played by a staff of ISC).
- As for the second polder, they put it in the second commune (further downstream on the board) to ensure “equity in development” as the first polder had been put upstream. The second polder was played by the Fishery Administration (played by staff of FiA). They put it in the place where they could protect the largest area of Chamkar (and the smallest area of Boeung). They also justified the position of the polder by the fact that the

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<sup>4</sup> There was an intense discussion on the “numbers” we considered when presenting the action cards. The representative of World Fish notably questioned the hypothesis we did and their lack of scientific basis. We tried to answer these concerns by saying that rather than the specific numbers what was important to focus on where the trends and how they compared to each other, stating that numbers could be easily changed in case they did not reflect the reality at al.

<sup>5</sup> Check excel file for more detailed information on whose player played which card and when. The excel file also provides detailed information on the quantitative results of the game session.

Chamkar there was close to a large area of boeung, hence more prone to flooding, and needed to be protected.

- As a whole the overriding rational that seems to have underpinned the location of polders is one of “protection & risk minimization” (e.g. polders were built in high areas that were the less likely to be flooded and/or areas that needed to be protected as they were at high risk to be flooded without infrastructure)



#### *Results Group 1 -- Round 2 (with discussion)*

- A significant change when comparing the two boards is that polders in the second round are surrounding Boeung and not Chamkar anymore. This is because, after thinking about it, the group decided that Chamkar was high enough and did not need to be protected while the boeung needed to be protected. There was no mention of the potential of poldering to intensify agriculture (shift to 2 or 3 crops of rice) – contrary to what had been discussed in the first round of group 2 (see below) but only of the need to protect crops from flooding.
- They used the territory represented in the board: they used the existing chamkar to justify the fact that they did not need to finish the polders (i.e. build dikes along the chamkar side of polder 1 located in the upstream part of the board). As they still had wooden piece, they built inside dikes in polder 1 to “materialize” different “compartments” to further protect crops from possible floods but also facilitate crop and water management on smaller more manageable areas (similar to group 2). The last card they added was a gate on Prek 3, ‘feeding’ into the polder as a way to show that there might be a need to control water going into the polder (notably in case of lack of water during the dry season – they could not play a pump as they had used all the pump cards at disposal before).



- Specialization of the area with the center of the board devoted to fishery; that is why they put also pump station –and not gates- on preks 6 and 7. This resulted from a collective decision making where people discussed the pros and cons of putting either gates or chamkar (Sopheaktra spend time discussing the numbers on the action cards)
- As far as the second polder is concerned, it was built after the gate on Prek 10 was built. Gates on preks 9 and 11 were built after. They also chose the location to ensure “balance” in development across the two communes and decided to protect one of the area that was the most prone to floods as surrounded by boeung.
- There was land clearing in round 1; during this second round they all agreed to dump the land clearing cards because even if they allowed increasing production they had a negative impact on fishery and they had agreed that the area where natural vegetation was found (light green) should be devoted to fishery.
- They positioned collective fishing close to commercial fishing and individual fishing to “at least” preserve/protect the fishery resource that is located in the downstream natural vegetation patch (e.g. a way to mitigate over exploitation). The cards “collective fishing” were used as “preservation/conservation” cards. This is also what emerged from group 2.
- The card commercial fishing was put at the extreme downstream of the board to “catch fish before it reaches Vietnam” (which is what fishery stakeholders also told us during interviews in the real world); an idea that would be recycle in round 2 in the other group (though this was played by Caroline and not a Khmer stakeholder)



- In terms of game process, for the first card, players chose the position of the action together (but the decision of which action a player will implement was made individually). For the other cards, the choice of the position AND of the action was done collectively (the individual showing the cards s/he had in hand). *[in the other*

*group, the initial card choice was done on an individual basis and the player proposed his/her choice to the group; if the group did not agree then the player would show his/her game and they would decide collectively what was best to play]*

*Results Group 2-- Round 1 (before any discussion)*

- The polders are all located in the boeung and the logic behind their placement is to ensure that crops are protected from flooding. The placement of polders came with a discussion of the possibility it represented to shift to double or even triple crops [*as has been observed in Vietnam in the 1990s*], which was notably voiced by the PDA representative.
- Sideth Muong (AFD, playing PDoWRAM) placed the land clearing card in the natural vegetation area, justifying that many gates and pumps had been placed at the entrance of the preks and that this would/should result in agricultural intensification. The second polder was then played in this area and the inside dikes are meant to represent ‘compartments’ to allow for easier crop/water management but also limiting the potential impacts of floods (as has been discussed in group 1, see above).
- No explicit logic regarding the positioning of gates and/or pumping station at the entrance of each preks. The commune representatives seem to have been the most interested in installing pumping stations



*Results Group 2-- Round 2 (with discussion)*

- As for group 1, one striking feature of the board in round 2 when compared to round 1 is that the location of the polders has changed dramatically. First located in the boeung, players have now build polders around Chamkar land. This seems to have been triggered by a better understanding of the rules of the game and deeper engagement with the tools to as to “win the game”

- For instance, players realized they got 5 tokens if a polder was built on a chamkar and only 3 token if built on the boeung – the result might then be an artifact of the game (what would have happen if we gave 5 token for increase in boeung production and 3 token for increase in chamkar crops)
- One element, which is likely to have shaped the board is also the fact that the strategy followed in round 1 led to an almost complete disappearance of fishery resources (which was highlighted during the debrief of round 1), leaving players to be more careful about the impact of their activities on this specific indicator. The “fishery player” (played by a representative of the FiA) was able to convince other players not to play cards that were too detrimental to the fishery sector by highlighting the benefit of keeping the water longer in the boeung (for fishing, the natural vegetation but also maybe rice production in the dry season)
- Engagement with the tool to “win the game” is not the only reason for positioning the polders. The group started playing in the downstream part of the board with “low infrastructural impact” cards such as sustainable agriculture, input sellers, collective fishery (see rationale above). Seeing that the area was developing, they then shifted their attention to the upper part of the board where they decided to build polders.
- Polders where build so as to “not impact” the fishing resources in the Prek (e.g. players preferred building small polders between two preks than big polder across preks). They also added a pumping station in the vicinity of the upstream polder to indicate that they may need to pump water in and out of the polder (to supply water during the dry season and drain water out in case of floods)
- Though the logic that underpinned the construction of the first polder is one of “balancing development”, the overall results is “unbalanced” with more high impact activities being concentrated in the upstream commune. This also illustrates the path dependency of infrastructure development whereby players used the dikes they had put in a former round to extend their polders for instance or positioned input sellers in the polders rather than outside (this lack of balance does not show in the quantitative results of the game as initial imbalance in terms of direct impact is rebalanced by the extra livelihood tokens given to illustrate that objectives are fulfilled).
- The two pumping stations at the two extremities of the large prek that divides the board in two parts were put there in order to ensure that the prek would have water the whole year round to support agriculture, which might not have been the case given its size (the pumping station at the tail end of the prek was played by Caroline who followed the advice of the other players)
- As for group 1, round 2 illustrates an engagement with the territory as represented by the board and a related “specialization” of space with some parts of the board being seen has having a high agricultural productivity potential (upstream where there is a lot of Chamkar), which calls for specific actions to enhance this potential while other parts of the board should be devoted to other activities (e.g. fisheries for instance). There is a need to be careful about the tools we use as the board itself might give people/players an idea of the (desired) development trajectory of the territory...





*Overall remark by JP Venot*

None of the boards (including those in round 1) strike me as “incoherent” (in the sense that infrastructures would have been positioned in areas that made little sense in hydrological or engineer terms, as was the case when we tested the game among ourselves).

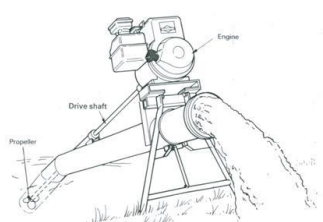
Every single action can be easily and soundly justified YET the results are strikingly different from one round to another highlighting that collective decisions do indeed differ significantly from individual decisions. Assuming that this is not only linked to a better understanding of the rules and mechanism of the game, **it might be important to try to know in more details what individual players considered in the second round that they did not consider in the first round.**

The quantitative results of the game (see excel file), though they are highly dependent on the calibration show that:

- Each group got a better result in the second round than in the first one (with higher livelihood improvement). The relative gain was higher in the first group.
- Strategies designed in the second round seem to be “more resilient” in the sense that they cope better with floods and droughts (less losses). The improvements are particularly noticeable in the second group.

## Appendix: Example of Action Card

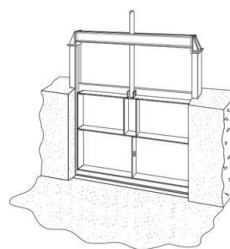
### Pumping Station



	Normal
Chamkar production	+2
Boeung production	+1
Fish	0
Satisfaction	-1

Dice	10-12	1
Loss	Big Flood	Low Flood
Chamkar production	0	-1
Boeung production	-2	0
Fish population	0	0
Satisfaction	0	0

### Gate



	Normal
Chamkar production	+3
Boeung production	+2
Fish	-2
Satisfaction	0

Dice	11-12	1-2
Loss	Big Flood	Low flood
Chamkar production	-5	-1
Boeung production	-3	-1
Fish population	0	0
Satisfaction	-2	0

## Appendix: Number of cards in the initial deck of cards

Cards 6 Players	1	Fishery commercial
	2	Fishery collective
	3	Fishery individual
	3	Polders
	5	Pump
	4	Gates
	2	Inputs
	2	Sustainable agriculture
	2	Land clearing
	<b>24</b>	<b>Total</b>

## Farmer -- Day 2 – 07/05/2019

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The game has been designed to be played with 5 players/farmers but can be played with up to 6 or 7 players/farmers if more people are present. The overall objective of the game is to discuss the potential impacts of floods and droughts on agriculture in the Prek area of Kandal province. Discussing the impact of floods and droughts on agriculture is a way to initiate a discussion among players about the issues they face and how they could solve **collectively**. The process of playing the game is described in detail in the corresponding guide. Here, we only focus on the findings related to the implementation of the game on May 7<sup>th</sup>, 2019.

### Group 1

- Farmers represented Prek Ta Doung and “stuck to the reality” as illustrated by the fact that the preks “mimicked” their actual position/shape (e.g. in “V”) (see picture below). At one point we tried to “force” the board into a geometrical shape but farmers refused to do so and we let the game developed on this basis – this meant re-designing the excel file used to enter and compute the data but this is not really important.
- There was no noticeable difference in “sharing scarcity” between the morning session and the afternoon session (players took a random number of marbles to meet their needs without much consultation). One of the players (green token; located in the downstream area of the boeung) took more water than he actually needed in both season. During the second round, the same person also tried to initiate a discussion on “how to share the resource if there was not enough water for all” but another player stopped the attempt and told him to stop talking and “go with the flow/play”.





## Group 2

- The choice of representing Prek Ta Doung was done as participants decided that the village chief of Svay Ta Mek knew the area quite well. The village chief of Svay Ta Mek came to the meeting with the idea of rehabilitating the entire Prek (he voiced his demand for support to the facilitator during the plenary session).
- The village chief did not care about his losses as “it is just a game” – he did not see the game as a way to engage a discussion on distributing losses/benefits.



## Transversal issues tackled during the afternoon discussion/debrief

- A difference emerged during the debriefing between the two groups. Group 1 (in which the village chief of Prek Ta Dong was very active) seemed to be of the opinion that the most important issue was the excavation of the upper part of the Prek (between the Bassac and the main road); in the other group the village Chief of Svay Ta Mek said that the issue was not only sedimentation at the entrance of the Prek but sedimentation all along the prek though he highlighted that excavation needed to be done without “enlargement” because enlargement would lead to significant loss of Chamkar land. The village chief of Svay Ta Mek may also have little interest in removing the silt at the entrance of the Prek (as he is managing the pump, his business depends on the existence of this silt at the entrance of the Prek).
- Several years ago a “rich person” from outside the area would have provided “a collective pump” against “100 hectares in the boeung”. The village chief of Svay Ta Mek would have accepted the deal without informing the people who used the Boeung

(land status of the boeung is unclear, likely registration at commune level). Since then, the pump is under the control of the village chief of Svay Ta Mek and farmers pay a contribution for the diesel though they said they do not really know how the money is used (the private investor would benefit from part of the fee that farmers paid) [this is a classic example of elite capture/lack of accountability, which seems to significantly affect the willingness of local actors to engage in collective action (see below)]

- Last year, PDoWRAM would have provided a pump to be used collectively but it seems no collective action is emerging (nobody wants to be a “leader” to install/maintain/manage the pump) due to the fact that the pump that is currently used is managed with little accountability (see above).
- A very specific idea of “collective action” (for the management of the pump or the maintenance of a rehabilitated canal) emerged during the discussion whereby participants identified a need for a “leader” who would be in charge of collecting contributions from individual farmers BUT also have the capacity and willingness to invest his own money as there are always people who do not contribute.
- Regarding sedimentation at the entrance of the prek: villagers are dependent on the willingness of private companies to extract the sediments and have little influence on where these private companies dig unless they actually “contract” them to dig in specific places (which they are not doing at the moment; private companies “pay themselves” by the sale of the land).<sup>6</sup> Whether these companies actually dig depend on whether they have a buyer for the soil they excavate. During the discussion, some participants expressed a sense of “urgency” hinting to the fact that the problem with the sedimentation at the entrance of the Prek was something to be resolved within days otherwise “it would be too late”. The village chief of Svay Ta Mek somehow dismissed these concerns saying that the problem was not the silt at the entrance of the Prek per se but that the entire Prek needed to be excavated.
- There are “private investors” who have excavators and dig land/plots in the boeung if the owners of the land allow them to do so (soil has a significant value). Excavation, hence, takes place in a totally unplanned way and can have detrimental impact on the prek canal itself as some areas can become increasingly silted due to mishandling of excavator, while others are deeper. This has impact on water availability for pumping with some farmers potentially facing lack of water at key moments.

### **Concluding remarks on the farmer level game**

Contrary to the first day of the meeting whereby the issues of flood and drought, in relation to agricultural development in the area, seemed to emerge as “boundary objects” that participants deemed important to work together on (instead of the boundary object terminology it is possible to use the ‘commons’ terminology), the water regime and how to

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<sup>6</sup> The “companies” digging the land did not show authorization letters from ministries to farmers.



manage its implication (distribution of losses/benefits of droughts and benefits) did not seem to emerge as a “collective issue” in the sense of being an issue around which a sense of “collective” (and collective action) could emerge. The issues around which collective action emerge seem more “mundane” in nature i.e. the sedimentation at the end of the Prek.

The fact that no “collective” emerged around the issues of floods, droughts and sedimentation might also be linked to the specific situation encountered in Prek Ta Doung – namely the capture of the collective pump located at the entrance of the Prek by the village chief of Svay Ta Mek, which was particularly vocal during the meeting.

The game is proving useful to identify the willingness/likeliness of farmers to engage in collective action regarding the long term management of the prek infrastructure but also to identify potential stumbling blocks for this collective action to emerge. As such, it might be interesting to use this tool “alongside” technical field visits during the feasibility and design phase of prek rehabilitation so as to identify specific issues that may require attention during and after rehabilitation to ensure sustainable management of the infrastructure.

When the issue boils down to difficulties that representatives may face in collecting members’ contributions, there is little the game session as we implemented it can do. Instead, it may be worth considering the organization of large meetings (with all community members) and using simpler tools (for instance passing a bowl in which people contribute what they want without other knowing) to question the consequences of “typical behaviors”.