International Institute of Social Studies

EL FUTURO DE LA ALIMENTACIÓN Y RETOS DE LA AGRICULTURA PARA EL SIGLO XXI:

Debates sobre quién, cómo y con qué implicaciones sociales, económicas y ecológicas alimentará el mundo.

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ELIKADURAREN ETORKIZUNA ETA NEKAZARITZAREN ERRONKAK XXI. MENDERAKO:

Mundua nork, nola eta zer-nolako inplikazio sozial, ekonomiko eta ekologikorekin elikatuko duen izango da eztabaidagaia

Flows of Power: unpacking equity implications of irrigating development for climate resilient food systems in Cambodia

Arnim Scheidel, Danik Song, Monyrath Seakchhy, Vannrith Rong and Courtney Work

Paper # 44

Apirila – Abril – April
24, 25, 26
2017

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INTERNATIONAL COLLOQUIUM

Flows of power: unpacking equity implications of irrigation development for climate resilient food systems in Cambodia

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Abstract

Policies to adapt peasant food- and farm-systems to a globally changing climate commonly focus on the development of resilient irrigation infrastructure. This is also the case in Cambodia, where currently several irrigation projects are developed and financed by overseas development aid (ODA). However, climate change adaptation interventions rarely distribute benefits evenly. This paper unpacks the equity implications of irrigation development for peasants in Cambodia, by drawing on a case study from the greater Aural area. The rehabilitation of the Lum Hach dam, an irrigation infrastructure that was first developed under Pol Pot during the 1970s, was initially welcomed by the farmers who all wished to improve access to water for both agriculture and the household economy. However, some farmers opposed the project after the authorities announced substantial changes to the system. The new canal layout would reconfigure flows of water, which would enhance access to water for some, while dispossessing and displacing others to make way for the new canals. Only limited information on the project and the official compensation procedures were communicated, which concerned many farmers who feared injustice. Related protests and mobilizations have resulted in several stakeholder meetings to resolve the issue. However, a complex network of global donors, national ministries and provincial and local authorities makes it difficult to tackle the rather delocalized responsibilities designed to ensure locally just irrigation development. By using the lenses of recognition, procedural and distributional justice, we map out new and old winners and losers of this process, as well as the potential mechanisms - i.e. collaborative action research - that could support redressing some of the injustices and impacts that have emerged.

Keywords: Irrigation; climate change adaption, environmental justice, collaborative action research, Cambodia

Introduction

Adapting agriculture and global food production to a globally changing climate is a key issue in mainstream agricultural policy and research, and is commonly conceived as progress toward what has been called ‘sustainable development’. Among a series of different adaptation strategies, the development of efficient water management and irrigation infrastructure is at the center of such agricultural adaptation efforts (Howden *et al.* 2007) and ‘climate smart

agriculture' (CSA) (Scherr *et al.* 2012). In this context, national policies target the adaption of peasant food- and farm-systems to global climate change through the establishment of resilient irrigation infrastructure (e.g., RGC 2013). Expected benefits include risk reduction to draughts and floods, increased food production, and rising incomes for smallholders due to rising agricultural productivity.

The implementation of irrigation infrastructure is sometimes perceived as a 'technological fix', whereas the absence of irrigation infrastructure is usually explained by lack of an adequate policy framework, technological capital and investment (Howden *et al.* 2007). Against this backdrop, many international development partners have started to fund irrigation projects through official development assistance (ODA), accompanied by technical assistance for project implementation, as seen for example in the case of Cambodia. However, as we will argue in this article, the development of irrigation infrastructure can unfold as a rather complex social process with significant implications for equity among those it aims to benefit. As with other land-based climate change mitigation and adaptation efforts, such projects do not unfold in a neutral or uncontested area nor do they necessarily have neutral impacts across different social groups of land users, particularly in fragile states (Hunsberger *et al.* 2017). Irrigation projects unfold within farming villages that are often characterized by place-specific ecologies as well as longstanding social, institutional and economic relations between villagers, or between villages, companies and the state as the implementing bodies. Consider for example existing power structures between farmers (Bernstein 2010), conflicting vision of what adequate agricultural practices are and what agricultural development should look like (Scheidel *et al.* 2013), as well as weak or rather 'selective' land governance that can favor some over the others - as it is commonly the case in Cambodia (Scurrah and Hirsch 2015).

This paper aims to unpack equity implications of irrigation development for peasants in Cambodia, by drawing on a case study from the greater Aural area. In doing so, we show that the reconfiguration of flows of waters is inherently reconfiguring 'flows of power' too (Swyngedouw 2004). The reconstruction of the Lum Hach dam, an irrigation infrastructure first developed under Pol Pot during the 1970s, was initially welcomed by the farmers who all wished to improve access to water for both agriculture and the household economy. It could secure funding by the Japanese International Cooperation Agency (JICA), coordinated through state authorities and implemented by local companies. However, some farmers started to oppose the project when the provincial authorities announced that the new canal layout would not only change the direction of water flows, but would also alter water equity by enhancing access for some, while dispossessing and displacing others to make way for the new canals. Only limited information on the official compensation procedures were made available, which many farmers did not perceive as just. Related protests and mobilizations have now emerged and several stakeholder meetings have been conducted to resolve the issue. However, the complex and delocalized network of a global donor, national ministries and provincial authorities makes it difficult to administer the safeguards to ensure locally just irrigation development. While the paper describes some of the justice concerns emerging in relation to issues of recognition, distributive and procedural equity (Schlosberg 2004), we also aim to identify how collaborative

action research (Conde 2014, Hunsberger *et al.* 2017) can enhance socially just irrigation development.

The following section provides an overview of climate change adaptation and the role of irrigation in Cambodia and introduces the Lum Hach irrigation rehabilitation project (Section 2). Section 3 briefly describes our conceptual approach as well as data employed in this paper, while Section 4 discusses emerging equity concerns. In our discussion section (Section 5) we summarize some of the challenges of socially just irrigation development and identify some paths forward - particularly through collaborative action research – to improve justice concerns. The last section summarizes our main points and concludes.

Background: Climate change adaptation, 'green development' and irrigation in Cambodia

Cambodia's adaptive capacity to face climate change is among the lowest within Southeast Asia (SEA) and farmers' vulnerability – many of which face already now a precarious livelihood situation (Ballard *et al.* 2007, Scheidel *et al.* 2014) – is expected to increase further with the effects of climate change, such as alterations in precipitation patterns, floods and droughts (Yusuf and Francisco 2009). The country's rhetoric vision to combat climate change is indeed ambitious and does not miss any buzzword: the government aims to develop *"towards a green, low carbon, climate-resilient, equitable, sustainable and knowledge-based society"* (RGC 2013, xvi). Concrete goals are a reduction of vulnerability of people and critical natural and social systems; a shift towards green development through low carbon technologies; as well as the promotion of awareness and participation in climate change interventions (ibid).

The Cambodia Climate Change Strategic Plan 2014-2023, formulated by the Royal Government of Cambodia (RGC), identified eight strategic objectives to achieve these goals. They rely on a language of inclusiveness, seeking participation of and partnerships between local stakeholders and the government, development partners and the private sector. Interventions to face a globally changing climate are identified to equally support national development planning, including economic growth, agricultural productivity and also to move from a least-developed country (LDC) towards a high middle-income country by 2030. The first strategic objective is to *"promote climate resilience through improving food, water and energy security"* and the second one is to *"reduce sectoral, regional, gender vulnerability and health risks to climate change impacts".* Water management is in fact a transversal concern among all eight objectives, but is most explicitly expressed under objective 1 and 2, the latter aiming further to *"introduce technologies in water work development and rehabilitation in order to respond to the negative impacts of climate change"* (RGC 2013, 35). Irrigation planning is under the leadership of the Ministry of Water Resources and Meteorology (MoWRAM).

Currently, there are several irrigation improvement projects underway in Cambodia. Among them is a series of six irrigation infrastructures funded by the development partner JICA under the 'West Tonle Sap Irrigation and Drainage Rehabilitation and Improvement Project', shown in Figure 1. Among the purposes of the project is to *"establish **equitable** and timely irrigation water supply system*

by rehabilitating irrigation and drainage facilities" (JICA and MoWRAM 2009, 7; emphasis added). Feasibility studies[1] were finalized until 2009 and the 4,269 billion yen (USD 42 million) project ODA loan was signed on August 23, 2011 to rehabilitate irrigation infrastructure in impoverished agricultural areas across 25,610ha of Kampong Chhnang, Pursat and Battambang provinces. Located in an area where more than 90% of agriculture has been rainfed, the project aims to boost paddy yields from average 1.5 tons/ha in 2009 to 3.2 tons/ha when the project will be finished. Annual average farming income is expected to be increased from 785,000 Riel (ca. USD 191) to 2,069,000 Riel (ca. USD 500). The project has also explicit aims to contribute to national food security by increasing food production for a growing local as well as national population (JICA and MoWRAM 2009).

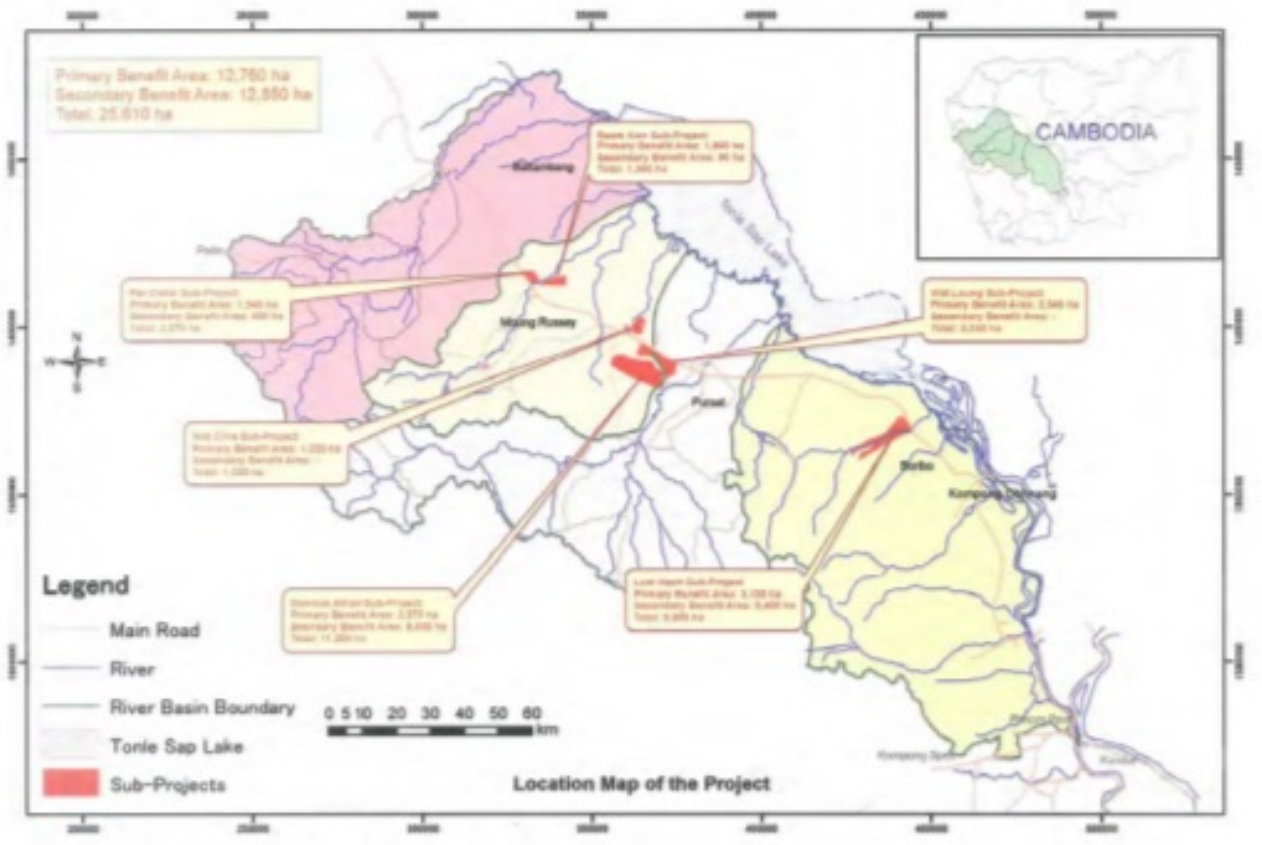

Figure 1: Irrigation construction and rehabilitation through the JICA funded 'West Tonle Sap Irrigation and Drainage Rehabilitation and Improvement Project'. Source: JICA and MoWRAM (2009).

The agreement, signed prior to RGC's formulation of the 2014-2023 climate change strategic plan, was not signed as an explicit climate change adaptation intervention. According to feasibility studies, it aims to contribute to several national policies: 1) the National Poverty Reduction Strategy, 2) the National Strategy Development Plan, 3) The Agriculture Sector Strategic

[1] There has been a Pre-Feasibility study and the "Special Assistance for Project Formation (SAPROF) Study" conducted by JICA for the West Tonle Sap Irrigation and Drainage Rehabilitation and Improvement Project. The studies covered project justification and feasibility, covering also social and environmental considerations.

Development Plan, and 4) the Policy for Participatory Irrigation Management and Development. However, the projects fits well into RGC's climate change strategic plan that argues that irrigation and water management are transversal issues required not only for climate change mitigation, but for several development objectives at once. Also the project's ex-ante evaluation stated that *"bringing stability to water supply by developing irrigation facilities has extremely high urgency as a countermeasure to changes in precipitation amounts and patterns that are caused by climate change"* (JICA 2011, 3). The importance of irrigation development as climate change adaption mechanism is shared also by provincial authorities and local villagers who recognize the advantage of an irrigation system for times of drought that may intensify with climate change (GD, 14; HGI, 10).

Figure 2: Leftovers of the broken infrastructure of the Lum Hach irrigation dam, Kampong Chhnang province, first constructed under Pol Pot during the 1970s. Source: the authors.

In this paper we focus on how the Lum Hach irrigation Sub project located in Kampong Chhnang province – one of the six larger infrastructures to be developed under the same ODA loan – is unfolding on the ground. The dam was first constructed under Pol Pot during the 1970s to use the Boribor River as source of irrigation in two areas: the O Roluss (North of Boribor) and the Lum Hach (South) system. Completed during 1977, the dam lasted only a few years, until it was damaged in 1981 and 1982. Afterwards it could only provide water to about 300ha, based on pumping. While MoWRAM did some rehabilitation during 2007 for the Northern part, the main infrastructure remains largely deteriorated (see Figure 2). The West Tonle Sap project has the objective to rehabilitate and upgrade the Lum Hach irrigation and drainage canals, which includes the reconstruction of the headwork as well as the development of main and secondary canals flowing through 6 villages inhabited by 9,624 persons (2009 data). Categorized by JICA as a 'class B' project, the irrigation project formally does not need an Environmental Impact Assessment (EIA) to comply with ODA

guidelines, but only an Initial Environmental Examination (IEE)[2]. The estimated primary benefit area amounts to 3,100ha (JICA and MoWRAM 2009). According to the report, the beneficiary villages are located in Krang Skear, Anhchanh Rung, Prasneb, and Phsar communes of Boribo district. Most of our analysis focuses on issues that appeared in Anhchanh Roung commune.

Approach: co-produced data, co-produced processes

The case presented here has been studied and supported by the MOSAIC project and research network, which aims to understand the emerging intersections of land-based climate change policies and land grabbing/conflict. While these two processes are distinct, they sometimes shape each other; either physically in the landscape, or institutionally and discursively, by legitimizing different types of land grabbing for climate change mitigation and adaptation ends (Fairhead *et al.* 2012, Hunsberger *et al.* 2017). The MOSAIC project has also an explicit normative and transformative end; it aims to support processes that would enhance socially just climate change interventions in a way that would account not only for 'impacts' defined from the perspective of policy-makers; but also account for local understandings of needs and justice of those affected.

Collaborative research and co-production of knowledge is a key requirement for such an undertaking. It refers to the processes in which research activities are conducted in close collaboration between professional researchers, local stakeholders and grassroots activists, including initial problem definition and framing. It is an important component in supporting local struggles for more just environmental decision-making (Conde 2014, Temper and Del Bene 2016, Hunsberger *et al.* 2017). This paper draws on such co-produced knowledge and employs data produced by both academics (i.e., interviews, field visits, secondary information, etc.) as well as grassroots driven action research (i.e., collection of evidences of impacts, interviews, etc.). Our attention to the project was drawn first when we started to identify different explicit and implicit mitigation and adaptation projects in the greater Aural Area and conducted some field visits to these sites. Attention of grassroots activists towards us was first drawn during some of these visits, in which they asked us for support in voicing their concerns over the project development. Since then, we have supported information flows between different stakeholders involved, for example through translating petition letters into English, provided basic capacity support and funding for action research activities (i.e. help with questionnaire design to collect evidence of impacts, funding to conduct meetings, etc.), and discussed the case among several NGOs and researchers to identify leverage points that would support the justice claims of local farmers.

The results of this collaborative research are therefore not only co-produced knowledge, but also co-produced capacities and processes, upon which we reflect in the following. For the grassroots research partners, the aim of these co-produced processes was basically to 1) be well informed about the project, and 2) achieve fair treatment in the establishment of the irrigation project, i.e. through

[2] Also according to the Cambodian "Sub-decree on Environmental Impact Assessment Process" (1999), only irrigation projects that develop an irrigation area larger than 5,000ha are required to carry out an Environmental Impact Assessment (EIA) to be approved by the Ministry of Environment.

just compensations. While the project in general has been welcomed by the farmers, they seek a project development that is both compatible with their livelihoods as well as visions of life; whereas for unavoidable impacts (i.e. land required for the establishment of dams) a fair compensation is asked for, that includes not only those impacts considered by project officials, but also those impacts perceived by local villagers. For this reason, they see their participation in the project development as crucial. For us, academic researchers and NGO staff, the aim of reflecting upon the co-produced processes in the following pages lies in better understanding how the irrigation project – as an example of a common climate change adaptation mechanism - can affect negatively several equity dimensions across those it aims to benefit, i.e. local land users; as well as to identify ways to enhance socially inclusive irrigation development.

We frame our subsequent discussion in terms of a) distributional equity/justice: who gets what benefits out of the project, and who has to carry the negative impacts; b) procedural equity/justice: who is able to participate, and in which way, in the decision-making processes of the project; and c) issues of recognition: who and what are perceived legitimate land users, land uses and livelihood visions by those who have the power to implement the project. These three concerns are well-know components of environmental justice movements and theories (Schlosberg 2004); they further represent useful theoretical lenses to understand local reactions, including conflict and opposition, to environmental projects. Beyond environmental justice issues, they are also core and overlapping inquiries of many other theoretical lenses aiming to understand local rural dynamics and environmental decision making, including the longstanding tradition of political agrarian economy and agrarian justice (Bernstein 2010); or the more recent literature on environmental governance within climate change adaptation (Adger *et al.* 2003, 2005). In addition to addressing emerging equity concerns in the rehabilitation of the Lum Hach irrigation project, we also aim to identify both challenges as well as opportunities that collaborative action research offers to achieve more just and socially inclusive irrigation development.

From flows of water to flows of power: reconfiguring benefits and beneficiaries through irrigation development

A key event in the recent development of the JICA irrigation project in Anhchanh Roung commune was in 2008. Outsiders came to the village, measuring the land and demarcating parts of agriculture and household plots with wooden stakes. At that time, most villagers did not know much – if anything – about the irrigation rehabilitation project and the activities of these outsiders caused much confusion. At first, many villagers thought the land measurement activities were related to Pheapimex Co., which in the past was granted a massive 315,025 ha agricultural concession in the surrounding areas and caused much land conflict previously (Licadho 2009). They feared land grabs would soon affect their village land as well. When they found out that the villagers were in fact the official beneficiaries for these activities, through the rehabilitation of the deteriorated Lum Hach irrigation dam, they generally welcomed the initiative. However, when the villagers realized that the implementing bodies planned not only to rehabilitate old canals, but (i) to extend and reconfigure the existing canal system and (ii) change the way access to irrigation water was managed, a series of concerns emerged immediately.

In this section we summarize these concerns by looking at concerns of recognition, procedural and distributive justice. Each phase of this irrigation project, the project design, project implementation, conflict resolution, and post-project water governance systems, was marked by inequity for local people (for a summary, see Table 1). While some of these concerns were in fact foreseen by JICA's initial Special Assistance for Project Formation (SAPROF) Study (JICA and MoWRAM 2009); the donor classified them as "not significant" and recommended a series of mitigation measures. On the ground, however, the project unfolded differently than the proposed measures, and the monitoring legally required of JICA was initially absent.

Table 1: Concerns of recognition, procedural and distributive justice in the development of the Lum Hach irrigation dam. Note: FWUCs (Farmer Water User Communities) are local institution to govern access to irrigation water. (Source: see text below)

	Recognition of local values and needs	**Procedural justice concerns**	**Distributive justice concerns**
a) Project planning and design	-Different understanding of root causes of water shortage (see below). -Livelihood problems framed from donor perspective (see below).	-Only few consultative meetings, no co-design of the project.	-Project design establishes future distributive concerns (see below).
b) Project implementation	-'Community' perceived as undifferentiated; authorities did not account for distinct needs of different actors in the implementation process.	-Little information on project shared with villagers. -No information on who will lose land shared in early stage.	-Enhanced access to water infrastructure for some farmers. -Dispossession and displacement for others farmers.
c) Land conflict resolution	-Monetary compensation cannot cover non-economic values of land. -Compensation fees initially do not cover fruit trees, which are important	-Compensation announced in USD currency, JICA response letter in English, not understood by villagers. -Intimidation and power relations shape consultative	-Compensation fees initially lower than neighbouring rates of Sinohydro irrigation project. -Compensation fees are below replacement cost and market value.

	livelihood assets.	meetings. -Information gate keepers (authorities)	
d) Project operation (water governance)	-Irrigation fees (project) are not accepted in principle, as water is considered by farmers to be a free good.	-Concerns over FWUC management and elections. -FWUCs across Cambodia characterized by chronically malfunctioning.	-Some affected farmers may not use irrigation water because they lost closeby paddy land. -Potentially unequal water allocation. -Not all farmers may afford to pay for irrigation water. -Richer farmers may use more water.

a) Project justification, design and planning

The project design phase was partly characterized by a lack of recognition of local livelihood values and inclusion in project planning. Several pre-assessments were conducted by JICA and related authorities (i.e. Ministry and Provincial Department of Water Resources and Meteorology – MoWRAM and PDoWRAM). Most relevant here were a Basin-wide Basic Irrigation and Drainage Master Plan Study (2007, January -2009, March), and the SAPROF Study (2009, July – December). According to these studies, during that time local stakeholders were consulted via questionnaires and workshops on their conditions and needs. In summary, their situation was described as follows: a) in these areas households have higher poverty headcount ratios, and b) due to the damaged irrigation infrastructure, farmers are largely dependent on rain-fed agriculture. The proposed solution was to rehabilitate and extend the former Lum Hach irrigation dam, which would allow boosting yields, increasing agricultural production and therefore producing additional incomes for poverty reduction.

In the interviews we conducted, many farmers would share this basic reading of the situation. However many added also deeper explanations of the problem, not recognized in the assessments. For instance, while most farmers indeed "depend on rain-fed agriculture" for many, this has been a choice, or rather, part of their traditional way of living. As explained by a female farmer and community representative, when the old dam was still functioning, people would

have had enough water for both wet and dry season paddy rice. Even then, they only cultivated rice during wet season, because their tradition was like this (Group interview, Oct 2016 (GD, 14)). With forests close by in the past, villagers further had access to ample additional livelihood sources. Therefore, the aim to develop dry season agriculture did not necessarily reflect the cultural and livelihood values of the villagers. Developing dry season rice cultivation reflected partly the values of the authorities and donors who wanted to develop a productive and surplus-providing sector (cf. Scheidel *et al.* 2013). The latter is commonly supported by monetary income and employment indicators that provide a biased account of poverty in rural areas, as it is unable to cover well environmental incomes and self-employment (see for example Jiao *et al.* 2015, Scheidel 2016).

Indeed, water-shortage is nowadays a growing problem for many villagers and the damaged dam is a central component of this. But also here, further explanations of the underlying causes are available; villagers reported that droughts increased after 1998, when outsiders came and cut down the forest: *"before, the forest attracted the clouds, and the clouds stayed in the village. Now the forests are gone and the clouds are blown away by the wind"* (Group interview, Oct 2016 (GD, 14)). This statement points to a much wider problem: local climate change caused by deforestation, triggered by companies and migrants clear-cutting forests. Companies – such as Pheapimex Co. – have in fact cleared vast areas of forest land (and forest carbon) for the establishment of large-scale agriculture (Davis *et al.* 2015), while dispossessing and displacing thousands of villagers across the country (CCHR 2013). This has triggered massive rural-rural migration flows of people displaced by such projects, moving elsewhere to re-establish their farming-based livelihoods (Diepart 2015), often contributing to small-scale logging. Yet attempts to tackle this larger root cause of water shortage caused by local climate change, which in turn is provoked by deforestation triggered by large-scale land concessions, have not been pursued.[3] To be fair, this is indeed far from straightforward and efforts to tackle this root cause would go way beyond the project scale.

In any case, villagers, authorities and donors agreed that the rehabilitation of the old dam would be one option to solve water shortage in the area, as well as to protect farmers from both flood and drought. Inclusion of farmers was, in summary, mainly limited to consultation, rather than co-design. For instance, only recently, the villagers realized that the project would not only rehabilitate the old dam, but rather build new canals that, while providing water to some famers, would also require land of others to make way for the canals. In spite of being the prime beneficiaries of the project, farmers' voices and needs received little consideration during implementation.

b) Project implementation

The project implementation phase was fundamentally characterized by a lack of consultation and participation, hence procedural injustices. For many villagers, the

[3] Note that in May, 2012, the Royal Government of Cambodia posed a moratorium on economic land concessions (ELC) known as Order 01, during which it revised and cancelled some ELCs that did not comply with the law, and started a large land titling program before elections to provide land titles to farmers in order to reduce land conflict. While this could resolve some issues, it was also criticized for selectively targeting not all affected land areas (Grimsditch and Schoenberger 2015).

first time they heard about the project was when outsiders came in 2008 to measure and demarcate their household and agriculture land plots (Figure 3). No prior information was provided on who was measuring the land and why. None of the villagers knew who would be benefiting from the project, and in which way. No information was given on who would be negatively affected, i.e. due to land loss to make way for the canals. All this caused much confusion among the villagers and in interviews, villagers expressed they did not know who to contact in case of doubts and questions. A few consultative meetings were held later on, once the ODA agreement was signed on August 23, 2011. According to the Ministry of Economics and Finance (MoEF), one meeting was held in Anhchanh Roung and Krang Skea commune on June 23, 2014; another one in Phasar commune during February 2016, and a third one in August 2016 in Bra Snep commune. However, these short meetings were not enough to inform all villagers and to allow for smooth project implementation. Thanks to petitions and protests of villagers that were consequently pursued, a few additional meetings were achieved during end of 2016 and beginning of 2017, during which several concerns could be resolved (see below).

Figure 3: Demarcation poles were set at villagers' household land without prior information. Source: the authors.

c) Conflict resolution regarding land acquisition

JICA's SAPROF study acknowledged that land acquisition for the canals would be a very sensitive issue. It would affect in total 475,8ha; 122,6 of which were associated to the Lum Hach Dam (JICA and MoWRAM 2009). While land acquisition for main and secondary canals were to be compensated by the national government, land for tertiary canals needed to be managed by the local authorities, i.e., commune and village authorities. Conflict mitigation measures were foreseen to *"support local authorities and community for land acquisition"*

and a procedure for *"participatory land acquisition"* was detailed in the study, with MoWRAM and PDoWRAM being the executing agencies. Their first initiative to 'handle' the compensation procedure was to state that there would be no compensation for villagers, because the project will benefit the 'community'. However, this was a conflictive assumption as across the 'community' there are some people who indeed would benefit from this by getting access to water, while others would in fact lose large parts of their land, or even would needed to be resettled (Figure 3).

Unsurprisingly, villagers' opposition to the project grew. Concerns were first publicly voiced in a meeting in May 2015, as well as in petition letters that followed during 2016. Two main concerns motivated the villagers to start opposing the project and to prepare petitions to the authorities: first the complete absence of adequate information that would allow them to clearly understand what was going on in their villages; and second, fear of land loss and unfair compensations over land acquisitions. The first petition dated August 5, 2016 was supported by local NGO AEC, and was directed to the provincial authorities, with copy to rights groups LICADHO and ADHOC. It was signed with thumbprints by 304 villagers (229 of which were female), from 4 villages of Anhchanh Roung commune (FN, 39). After unsatisfactory response, the second petition dated December 7, signed by 447 villagers (322 of which were female), and supported by AEC, EC, MOSAIC (ourselves) and Mekong Watch Japan repeated the demands to receive adequate information and compensation. This time it was directed to national authorities (MoEF, MOWRAM) and the donor (JICA).

The petitions triggered a series of negotiations that gradually could enhance the recognition of farmers' values and needs, their involvement in the project – at least at a consultative level – and distributive justice by levelling the distribution of benefits and burdens of the project across villagers. Regarding the recognition of villagers' values towards land, it is striking that initially no conflict resolution or compensation was foreseen for tertiary canals by provincial authorities. Land is not only the first and foremost livelihood asset in Cambodia, but also fundamentally part of a family's life, connected to the land not only economically, but also historically and culturally. After negotiations, monetary compensation were introduced that may compensate – to some extent – economic damages but not necessarily damages of other, incommensurable value dimensions (Martinez-Alier *et al.* 1998). One farmer stated for example, that even if compensation payments would be fair, she would not be happy about the dam, because she is attached to her old land (Group interview, Oct 2016 (GD, 14)). Initially, compensations were also planned only for land plots, but not considered for fruit trees, despite of being important economic assets for small-farmers. Villagers found it also unjust that compensation rates were lower than the neighbouring Sinohydro irrigation project, and well below replacement costs or market value.

The way that meetings over compensation concerns were held was also worrying. After the provincial authorities agree that some compensation would need to be paid, some people received compensation slips while others did not. Most people did not know what was going on. The village chief – partly responsible for the compensation process at the village level – is over 80 years old and did not know much about the project. His assistant handled some of the

information, but most villagers were not informed. Further, when the first official compensation slips were awarded, fees were announced in USD instead of Cambodian Riels. Some farmers signed, but when they found out how little the amount was they regretted and started to protest. Others had signed the low compensation agreement for some of their land plots, but joined the complaints for higher rates for the remaining plots.

These actions led to the second round of petitions in 2016 described above. The follow-up meetings after the second petition, however, were marked by unequal power relations and intimidating statements from provincial authorities such as *"are you sure you really do not want this dam?"* and villagers were accused of mobilizing against the authorities for political reasons and not because they had legitimate issues. These reactions came despite the fact that villagers, in their petitions, explicitly welcomed the project in general, but rather complained about lack of information and compensation. The donor initially also refrained from getting involved, in spite of the legal obligation to monitor project implementation. JICA's reply to the petition was written in English and not delivered directly by JICA, but was sent through provincial authorities who were part of the villagers' concern and apparently gate-keeping some information flows. The letter was not legible to the villagers, and they were subjected to intimidation by the provincial authorities. This response prompted the writing of a third petition letter sent to JICA on Jan 18, 2017. This letter addressed these procedural issues and further reminded JICA of its responsibility to monitor the project development according to the JBIC 2002 guidelines[4].

Finally, JICA as well as MoEF replied to the petitions in both English and Khmer. Consequently, a large consultative meeting was held in February 2017 where villagers, provincial and national authorities, donors and watchdog NGOs gathered. While compensation rates still remain below replacement cost, during this meetings a few important advancements were achieved for the community. First, that several types of fruit trees, as well as trees used for local construction, would be included in the compensation, and second that compensation fees would be equal to those of the neighbouring Sinohydro dam. Moreover, the authorities shared detailed information of the project as well as a 'conflict resolution' hotline to call if things did not go according to agreed-upon procedures. As of early April 2017, several additional consultative meetings had been held and official slips containing the higher compensations rates were issued to affected villagers. This was an important advancement for the many villagers who signed the petitions, as well as for all the other villages in neighbouring communes affected by the irrigation project who would benefit equally from this achievement.

d) Project operation: Water governance post-inauguration

The construction of the Lum Hach headwork started in October 2016, and will take until 2018 to finish the whole project. While compensation issues seemed to be settled – at least on paper – concerns remain over water governance once the project is operational. In line with the government's Sustainable Irrigation Policy

[4] JICA and the Japan Bank for International Cooperation (JBIC) merged in 2008; hence JICA ODA loans must adhere to JBIC's 2002 guidelines.

(1999), irrigation projects are to be managed in a participatory way through Farmer Water User Communities (FWUCs). Such local scale institutions consist ideally of a democratically elected committee responsible to manage water access for individual members; i.e., farmers connected to the irrigation infrastructure (Perera 2006). Operation costs of FWUCs are maintained by an Irrigation Service Fee (ISF) that for the Lum Hach dam was proposed to be 4$/ha for gravity- and 1$/ha for pumping irrigation per season (JICA and MoWRAM 2009). FWUCs have the positive benefit of bringing water management institutions to the local scale. However, FWUCs can also create a series of concerns regarding recognition, procedural and distributive justice. Stories of water conflict within and between FWUCs are in fact common across Cambodia (Perera 2006, Chem *et al.* 2010).

Most centrally, farmers do not want to pay for irrigation water via ISFs. This is partly due to economic concerns, which however would also be offset by increased agricultural production and incomes. Yet it is mainly related to the values of Cambodian farmers who perceive water as a common good. As expressed by several farmers (Group interview, Oct 2016 (GD, 14)), water is considered as a free good for which farmers do not want to pay. This is not only the case for the villages described here, but a general issue across many other regions in Cambodia, where FWUCs have trouble in collecting maintenance fees. Yet in turn, this makes FWUCs committees sometimes powerless in assuring equal water allocation, as they also need money to manage and maintain fair and just water access (i.e., gasoline for meetings, canal maintenance, etc.). While FWUCs are initially supported financially through the project, such problems are likely to intensify once implementing agencies fade out. Concrete concerns over the formation of the FWUC for Anhchanh Roung village were already voiced by villagers. Some worried that the FWUC leader will *"not be a good person*" (Group interview, Oct 2016 (GD, 14)), and others did not know how the upcoming FWUC committee was elected. The committee list, presented to the villagers were in fact characterised by several mistakes, i.e., pictures and names of the persons did not coincide. The electing body could hardly represent the water users, as at that time most villagers did not even know who would benefit from the dam. Farmers who signed the petition demanded in fact a re-election of the FWUC committee (Petition to JICA; 19th January, 2017).

Concerns over unequal irrigation water allocation were voiced already in the SAPROF study. Proposed mitigation measures were a) the strengthening of the FWUC capacity through training programs, and b) monitoring of FWUCs through the government in order to correct water management to avoid water conflict. However, given that initially the local government did not even plan to pay out compensation for certain types of 'land loss', it is unlikely that it will intervene if some people face 'water loss', which is much more difficult to assess. Sometimes, local elites abusing common water infrastructure, are also connected to provincial elites and ruling party members. For instance in the Kuch Nup Irrigation dam in neighbouring Pursat province, most of the water was re-channelled from the reservoir to fish ponds owned by local elites, while all down-stream farmers were left without water. The FWUC was unable to negotiate with the local elites, who were in a better economic and political situation. Local elites did not even live in the village, but came only there to do business. Some villagers alleged them to be closely connected with district and provincial elites (Field research, Oct 2016). Hence, water access is often closely shaped by power relations. A reconfiguration

of flows of water through irrigation development means therefore often also a reconfiguration of flows of power.

Challenges and pathways forward: collaborative action research

Above we have described concerns over recognition, participation and distribution of the benefits and ills of irrigation development for small-farmers. They have emerged in response to manifold conditions and processes that appear at different scales, of which we summarize some below.

First of all, Cambodia has been generally characterised as a fragile state in which institutions are weak, particularly regarding land governance (Diepart 2015, Scurrah and Hirsch 2015). However, rather than 'weak land governance', 'selective land governance' would sometimes be a more appropriate term. Cambodia has in fact many solid and established laws on land use and ownership as well on project development that would provide a sufficiently well established legal basis to handle conflicts in more just ways. However, these laws are only selectively applied in a way that purposefully benefits some, at the cost of others. An example is the initial decision by provincial and local authorities to not pay any compensation fees for land losses. Being those in power, such decisions would have allowed them to save money on the project, however at the cost of the affected farmers. JICAs absence in monitoring project implementation further nourishes selective land governance. A Cambodian-wide example is the establishment of Order 001, under which farmers with land conflict should receive land titles to reduce land conflict. The implementation of this order was criticized for being largely selective and avoiding areas with major land conflicts (Grimsditch and Schoenberger 2015).

Another problem is that while impacts are localized, responsibilities are de-centralized, and actors have been shifting the blame between each other. Place-based communities cannot easily access national and international policies level – some of which use different languages and currencies. This makes it difficult to identify focal and leverage points to address concerns adequately. Moreover, there was some information gate-keeping between local authorities and villagers, indirectly supported by the donor through using only the authorities to channel information. We also saw a lack of capacity to share basic project information and assure information flows between stakeholders (see also Käkönen *et al.* 2013). The village chief – a man over 80 years old – did not know much about the project, and his assistant was accused of not sharing information with the villagers. Construction companies argued that authorities need to pay compensation, while the authorities blamed it on the companies. JICA as a donor initially refused to intervene, arguing they are not supposed to pay compensation, which however was not the intervention sought from JICA by the villagers. JICA submitted their first response letter to villager complaints only in English (not understandable to villagers), and handed the letter to them through local authorities who took the opportunity to intimidate and accuse affected villagers

of being only politically motivated. JICA needed to be explicitly reminded in a second letter that they were responsible for project monitoring.

In sum, this complex network of actors with shifting responsibilities, unequal capacities, and unequal power relations makes it truly difficult to seek intervention for just irrigation development in a political climate that facilitates selective land governance. Yet in our case study we demonstrate how some initial concerns could in fact be resolved. We are convinced that collaborative action between affected villagers, civil society organisations and ourselves - academic researchers - played a relevant role in achieving enhanced participation and consultation, and payment of higher compensation fees. Action research is understood as research conducted by non-academics, often in close collaboration with academics. It co-produces knowledge that is place-based and socially relevant, and usually useful for both activists and academics. Activists and affected groups often have data required by academics for their problem analysis, while academics produce new data useful for activists in their advocacy efforts (Conde 2014). For academics it allows contextualization of data in local understandings and histories, and academic partners who publish in peer reviewed journals can give grassroots data higher credibility in campaigning. Finally, academics can add a set of new skills to the shared agenda for change, and local activists often are crucial in establishing local contacts for research. Both academics and activists, however, need to be motivated by seeking action for change (Borras 2016). In such a setting, collaborative action research can favour subaltern groups in their struggles to diminish injustices (Hunsberger *et al.* 2017).

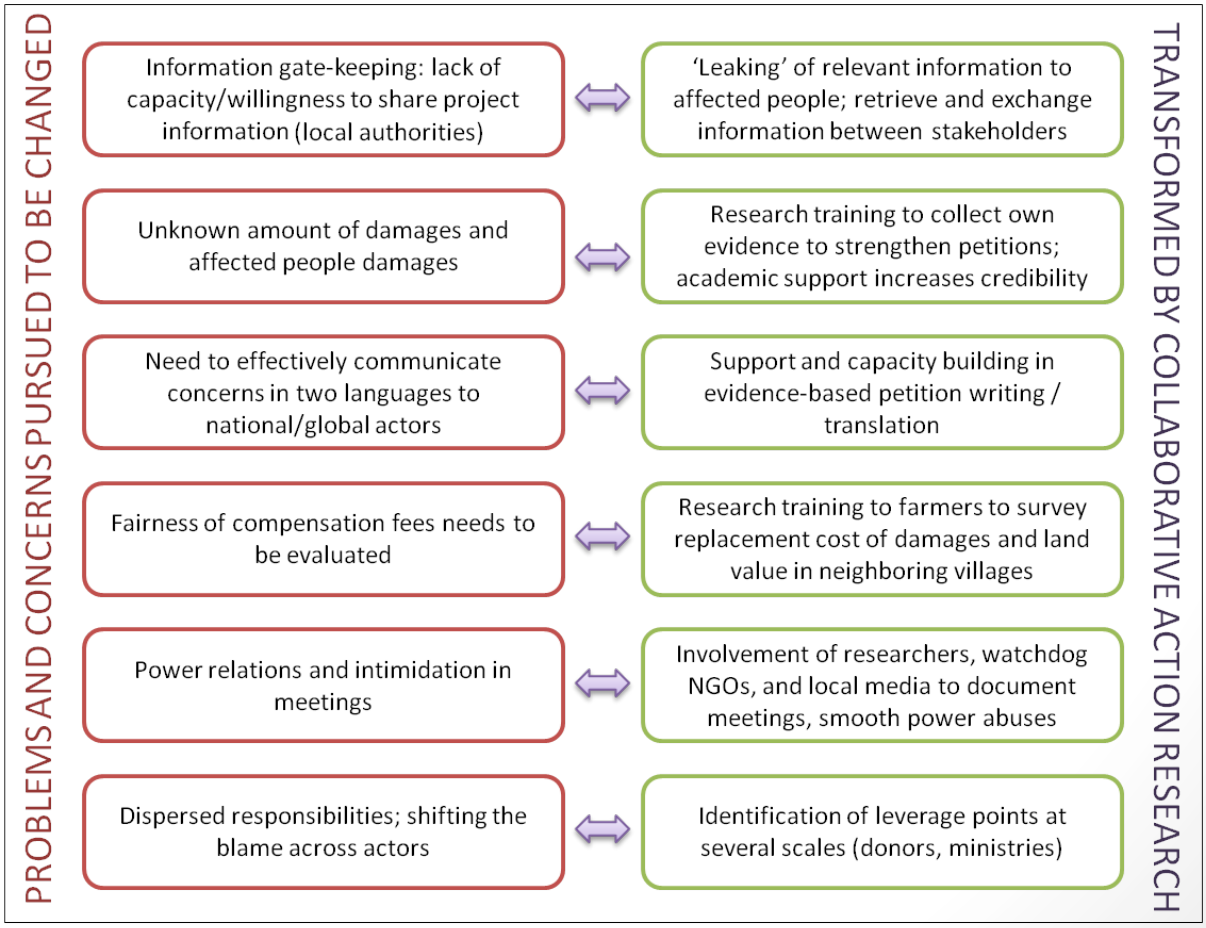

Figure 4: Collaborative action research as a way to effectively address a series of concerns over procedural and distributive justice. Examples refer to the Lum Hach irrigation rehabilitation project.

In our case study, collaborative action research could address a series of specific problems (see Figure 4). Gate-keeping of information, combined with lacking administrative capacity to share project information, could be overcome by retrieving information from different actors through research-focused interviews and secondary data gathering, that we 'leaked' to the affected communities. Affected communities shared with us initially their concerns, allowing us to ask the relevant questions in interviews. This has supported an enhanced information flow between different stakeholder groups. Research training to farmers to collect and document evidences in a professional way helped to assess the overall damage caused by the irrigation project, and could further support evidence-based petitions later on. Petition writing was also supported by a negotiating skills training, translation support and feedback on the petition content. Also a basic survey design was co-produced with farmers in order to survey market value of livelihood assets (i.e. land) in neighbouring villages, as well as compensation fees received by neighbouring farmers in similar situations (i.e. through the Sinohydro irrigation project). Data collection is also conducted by affected farmers. For them, it helps to assess the fairness of the compensation received, whereas for us all these data are useful to understand the causes and extent of environmental injustices associated to CCMA initiatives.

Finally, researchers and civil society organisations can add important qualities to multi-stakeholder processes that could support affected families. For example, we believe the intimidating statements and abuse of power relations observable within the consultative meetings could be reduced by ensuring the presence of professional researchers, watchdog NGOs, and local media. In such a setting, statements by political party authorities are made much more carefully as they might be disseminated through media, campaigning (and research), particularly in pre-election times. This collaboration also helped us to pin down responsibilities of different actors and to identify relevant leverage points. The involvement of the Japanese NGO Mekong Watch was key to identify in which legal ways, and according to which Japanese laws and guidelines JICA was responsible to monitor the project development. This information was very useful for villagers to remind JICA of their responsibilities in subsequent petitions and helped to increase JICA's stake and participation in the consultative meetings.

Collaborative action research therefore does not only co-produce knowledge, but moreover also co-produces processes. This is relevant to recognize as finally such processes initiate positive change for subaltern groups. Obviously these processes are supported, and depend on, locally and socially relevant knowledge, co-produced in a rigorous way.

Conclusions

Irrigation development to adapt small-scale agriculture to a globally changing climate can bring positive development to farmers by enhancing stable water

supplies. However, irrigation development is more than a 'technical fix' because it unfolds within complex ecological, social and institutional environments, characterized by multiple interests, agendas and power relations between different actor groups. It therefore can also bring disadvantages to some groups, i.e. when their land is required to make way for water canals that benefit others, and no mechanisms are available to assure their damages would be equitably compensated. Equal attention must also be paid to environmental injustices that may emerge through the reconfiguration of flows of water, sometimes allying with a reconfiguration of 'flows of power'. If climate change adaptation policies are to benefit small farmers in a just and inclusive way, then equal attention needs to be paid to the ecological as well as the social landscape.

Within the web of actors, the subaltern status of affected groups can make their struggle for recognition, participation and distributive justice an uneasy path. What we show in this paper is that collaborative action research, characterized by shared agendas and capacities of affected people, civil society organizations and academics, can help to achieve positive change. Collaborative action research co-produces socially relevant and credible knowledge that can favour the negotiation power of such groups, as well as academics' understanding of the conflicts caused by interventions related to climate change mitigation and adaptation policies. Beyond knowledge, collaborative action research moreover co-produces relevant processes, which in the case described above, could significantly enhance recognition, participation and fairer compensation within irrigation development and thus within climate change adaptation efforts.

Acknowledgements

We thank the villagers for the close cooperation and hospitality that enabled this collaborative research. The first author acknowledges a Catalan AGAUR Beatriu de Pinós research grant [2014 BP_A 00129]. The other authors acknowledge funds from the MOSAIC project, funded through NWO and DFID through the CoCooN - Conflict and Cooperation in the Management of Climate Change - Integrated Project. The research was developed within, and contributes to, the MOSAIC research network. We are thankful to all its collaborators for fruitful discussions.

References

Adger, W.N., N.W. Arnell, and E.L. Tompkins. 2005. Successful adaptation to climate change across scales. *Global Environmental Change*, 15(2), 77–86.

Adger, W.N., K. Brown, J. Fairbrass, A. Jordan, J. Paavola, S. Rosendo, and G. Seyfang. 2003. Governance for sustainability: Towards a 'thick' analysis of environmental decisionmaking. *Environment and Planning A*, 35(6), 1095–110.

Ballard, B., C. Sloth, D. Wharton, I. Fitzgerald, K. Murshid, K. Hansen, P. Runsinarith, and L. Sovannara. 2007. *'We are living with worry all the time' - A Participatory Poverty Assessment of the Tonle Sap.* Phnom Penh: Cambodia Development Resource Institute.

Bernstein, H. 2010. *Class Dynamics of Agrarian Change*. Halifax and Winnipeg: Fernwood Publishing.

Borras, S.M.J. 2016. Land politics, agrarian movements and scholar-activism. *Inaugural Lecture*.

CCHR. 2013. *Cambodia: Land in Conflict. An Overview of the Land Situation*. Phnom Penh.

Chem, P., S.S. Kim, and D. Khiev. 2010. *Empirical Evidence of Irrigation Management in the Tonle Sap Basin: Issues and Challenges*. CDRI Working Paper Series. Phnom Penh.

Conde, M. 2014. Activism mobilising science. *Ecological Economics*, 105, 67–77.

Davis, K.F., K. Yu, M.C. Rulli, L. Pichdara, and P. D/'Odorico. 2015. Accelerated deforestation driven by large-scale land acquisitions in Cambodia. *Nature Geosci*, advance on.

Diepart, J.-C. 2015. *The fragmentation of land tenure systems in Cambodia: peasants and the formalization of land rights*. Paris.

Fairhead, J., M. Leach, and I. Scoones. 2012. Special Issue:- Green Grabbing: a new appropriation of nature? *The Journal of Peasant Studies*, 39(No. 2 April), 237–61.

Grimsditch, M. and L. Schoenberger. 2015. *New Actions and Existing Policies: The Implementation and Impacts of Order 01*. Phnom Penh.

Howden, S.M., J.-F. Soussana, F.N. Tubiello, N. Chhetri, M. Dunlop, and H. Meinke. 2007. Adapting agriculture to climate change. *Proceedings of the National Academy of Sciences*, 104(50), 19691–6.

Hunsberger, C., E. Corbera, S.M.B. Jr, C. Jennifer, K. Woods, C. Work, R. De Rosa, V. Eang, R. Herre, S.S. Kham, C. Park, S. Sokheng, M. Spoor, K.T. Aung, R. Thuon, C. Vaddhanaphuti, K. Woods, C. Work, R. De Rosa, V. Eang, R. Herre, S. Sam, C. Park, S. Sokheng, M. Spoor, S. Thein, K.T. Aung, and R. Thuon. 2017. Climate change mitigation, land grabbing and conflict: towards a landscape-based and collaborative action research agenda. *Canadian Journal of Development Studies / Revue canadienne d'études du développement*, in press(March).

Jiao, X., C. Smith-Hall, and I. Theilade. 2015. Rural household incomes and land grabbing in Cambodia. *Land Use Policy*, 48, 317–28.

JICA. 2011. *Ex-ante Project Evaluation - West Tonle Sap Irrigation and Drainage Rehabilitation and Improvement Project*.

JICA and MoWRAM. 2009. *SPECIAL ASSISTANCE FOR PROJECT FORMATION FOR WEST TONLE SAP IRRIGATION AND DRAINAGE REHABILITATION AND IMPROVEMENT PROJECT IN THE KINGDOM OF CAMBODIA - FINAL REPORT: VOLUME-I (MAIN REPORT)*.

Käkönen, M., K. Karhunmaa, O. Bruun, H. Kaisti, V. Tuominen, T. Thuon, and J. Luukkanen. 2013. *Climate mitigation in the least carbon emitting countries - Dilemmas of co-benefits in Cambodia and Laos*.

Licadho. 2009. *Land grabbing & Poverty in Cambodia: The Myth of Development*. Phnom Penh: LICADHO - Cambodian League for the Promotion and Defense of Human Rights.

Martinez-Alier, J., G. Munda, and J. O'Neill. 1998. Weak comparability of values as a foundation for ecological economics. *Ecological Economics*, 26(3), 277–86.

Perera, L.R. 2006. *Factors Affecting the Formation of FWUCs in Institution Building for PIMD in Cambodia: Two Case Studies*. Water Management.

RGC. 2013. *Cambodia climate change strategic plan 2014 – 2023*. Phnom Penh.

Scheidel, A. 2016. Tactics of land capture through claims of poverty reduction in Cambodia. *Geoforum*, 75, 110–4.

Scheidel, A., K.N. Farrell, J. Ramos-Martin, M. Giampietro, and K. Mayumi. 2014. Land poverty and emerging ruralities in Cambodia: Insights from Kampot province. *Environment, Development and Sustainability*, 16(4), 823–40.

Scheidel, A., M. Giampietro, and J. Ramos-Martin. 2013. Self-sufficiency or surplus: Conflicting local and national rural development goals in Cambodia. *Land Use Policy*, 34, 342–52.

Scherr, S.J., S. Shames, and R. Friedman. 2012. From climate-smart agriculture to climate-smart landscapes. *Agriculture & Food Security*, 1(1), 12.

Schlosberg, D. 2004. Reconceiving Environmental Justice: Global Movements And Political Theories. *Environmental Politics*, 13(3), 517–40.

Scurrah, N. and P. Hirsch. 2015. The political economy of land governance in Cambodia, (November), 23.

Swyngedouw, E. 2004. *Social sower and the urbanization of water: flows of power*. Oxford New York: Oxford University Press.

Temper, L. and D. Del Bene. 2016. Transforming knowledge creation for environmental and epistemic justice. *Current Opinion in Environmental Sustainability*, 20, 41–9.

Yusuf, a a and H. Francisco. 2009. *Climate Change Vulnerability Mapping for Southeast Asia Vulnerability Mapping for Southeast Asia*. East. Singapore.

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