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Agricultural Land Conversion Drivers in Northeast Iran

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Abstract

This paper reports the results of the first phase of a study that examined the trend and the main drivers of agricultural land conversion (ALC) in Northeast Iran. Using a multi-stakeholder analysis approach, data were obtained from agricultural land use policy makers in the Khorasan-e-Razavi province. The results showed that ALC in this province is on the rise. The policy makers identified different drivers for ALC and found it a very complex process. They attributed the main ALC driving forces to "economic", "political", "institutional", "technical", "infrastructural", "social", and "environmental" factors. The results also showed that, in the view of the policy makers, the "political and economic reforms" should be the first and the most important priorities to respond to ALC followed by establishing proper "legislation and law" processes and "institutional arrangements" while "technical" and "environmental" aspects remain as their last priority.

About the Authors

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1 Introduction

As human civilization evolved, people began planting crops, rearing animals, developing complex irrigation schemes, building cities, and devising technologies to make life more comfortable and less vulnerable. This transformed landscapes on over 40 percent of the Earth's ice-free land surface (Foley et al., 2005). Among the various factors that change the Earth's surface, agriculture plays a key role (Billington, Kapos, Edwards, Blyth, & Iremonger, 1996). Land management practices and cropping patterns have a vast effect on biogeochemical cycles, freshwater availability and soil quality. Land also plays an important role in emitting and storing greenhouse gases (Roson & Palatnik, 2009; The World Bank, 2010). Cropland areas are also being converted from small holdings to increasingly large areas. This is affecting the stability of landscape patterns (Lambin, Geist, & Rindfuss, 2006).

According to IFAD (2012), about 2 billion people live in and work on small farms in developing countries. This large group of farmers, who produce about 70 percent of the developing world's food, struggle to make a living from small-scale intensive farms (Murshed-E-Jahan and Pemsl, 2011, Koczberski and Curry, 2005). Many of these farmers are also facing the prospect of land dispossession (Palmer et al., 2009). Such uncontrolled land instability shows why we are currently at a "tipping point" for the future of family farming and rural societies (Anseeuw et al., 2012).

Uncontrolled agricultural land conversion (ALC) has great impacts on the environment in general and agricultural products in particular. ALC is a phenomenon that is almost unavoidable during economic development and population growth periods (Tan, Beckmann, van den Berg, & Qu, 2009). The phenomenon of ALC in different countries is varied in terms of intensity, trends and drivers. Among others, high population density, rapid economic growth and the urbanization process are known as the main drivers of ALC (Ho & Lin, 2004). ALC is the result of many interacting processes and drivers which operate over a range of scales (both temporal and spatial) and have an impact on the human environment (Munroe & Müller, 2007; Schneeberger, Bürgi, & Kienast, 2007).

Climate change is also one of the most complex challenges of our young century and no country is immune (The World Bank, 2010). Although this global environmental change has many interacting components, land use/land cover change or land conversion probably represents the single most important factor affecting ecological systems (Mondal & Southworth, 2010; Turner II, 2002, 2009; Vitousek, 1994). Among the various types of land conversions, ALC is the most important one. This is not only because it currently has the biggest transformative power on the earth (Billington, et al., 1996), but also because in the last 50 years, several regions of the world have seen cropland areas stabilize, and in some areas, there has even been a decrease (Ramankutty et al., 2006). For example, according to the 2012 edition of the FAO Statistical Yearbook, Iran has one of the highest rates of ALC (-2.1% Arable land per person during 1970-2009) (FAO, 2012). While, agriculture is one of the most important sectors of Iran's economy, the sector currently constitutes 10% of the country's GDP and 18.2% of total employment. Agricultural products form about 30% of Iran's non-oil exports (based on reports of The Statistical Center of Iran). As FAO has reported, Iran ranks amongst the top seven countries in producing 22 important agricultural products. In recent years, the pace of change in agricultural lands to non-agricultural lands is intensifying in the country. Now the lands are fragmented and crumbling. This process has intensified ALC. Apparently, so far not only have all the government policies and plans failed to control ALC, but some of them have exacerbated it.

This study examines the trend and the main drivers of ALC in Northeast Iran. First, the methodology of the paper is described, followed by the drivers of land use change. Second, the rapid changes of agricultural land conversion in Iran are explained. Third, the main drivers of ALC in the study site are presented and the response to land conversion is discussed. Accordingly, an effort is made to

understand the combination of driving forces behind land conversion. Finally, a conclusion is drawn with regard to the main findings of this study.

2 Methodology

This study benefitted from a mixed-method approach that included both qualitative and quantitative measurements. Data were collected using a multi-stakeholder approach (Azadi et al., 2011a). The main stakeholders were: farmers, executive officers and policy makers.

During the first stage, policy makers were interviewed using the Delphi technique (Linstone and Turoff, 2002). The technique was carried out in three stages. In the first stage, a questionnaire with six open-ended questions was designed. Then, during a focus-group interview (Krueger and Casey, 2000), the opinions of agricultural land use policy makers toward the five research questions were solicited. These questions were focused on the following issues:
1. The trend of agricultural land use change (increasing, decreasing or stable), its future, and the most important causes of this trend.
2. The characteristics of farmers who are more willing to change their agricultural land uses.
3. Farmers (large, medium and small) who are most vulnerable to ALC.
4. The most important public policies to support vulnerable farmers (to encourage them to keep agricultural land).
5. Alternative strategies which farmers can take to deal with or to face ALC.
6. Most proposed ways to preserve agricultural lands.

In the second stage, the main keywords and variables of these interviews were extracted. Then, these keywords and variables were included in the second round of the Delphi questionnaire, which used a five-point Likert continuum (from 1 to 5, which correspond with "fully disagree", "partially disagree", "no opinion", "partially agree", and "fully agree"). The answers were coded and entered into SPSS (version 20). Finally, using descriptive statistical methods, the main ALC driving forces were analyzed and answers to the questions were acknowledged.

3 Drivers of land use change

There are many processes that are driven by biophysical and socioeconomic drivers that shape landscape patterns and determine their spatial organization (Van Doorn & Bakker, 2007). Some researchers such as Setiawan and Purwanto (in Firman, 1997) classified these drivers in two main groups, namely, internal and external. The main external drivers include industrialization (Ho & Lin, 2004; Lichtenberg & Ding, 2008), urbanization (Han & He, 1999; Ho & Lin, 2004), road infrastructure development (Ho & Lin, 2004; Lichtenberg & Ding, 2008; Nelson, 1990) and government policy. Internal drivers mainly include land productivity (Levia et al., 2000) and technology intensity.

Hersperger (2007) divides these driving forces into five groups: cultural, natural/spatial, political, economic and technological. The cultural driving forces set the societal framework while the natural/spatial configurations drive the physical background for other driving forces. Individual actors of landscape change can rarely modify these two groups of driving forces. Political and economic driving forces are strongly interlinked since economic needs and pressures are reflected in political programs and economic instruments are used to implement political driving forces. Lastly, technological driving forces are discussed in the context of political and economic change of agricultural lands. Such a complex nature of ALC has made its driving forces, their relationships and processes extremely important for different stakeholders including scientists, agricultural land managers and policy makers to create appropriate strategies that can preserve agricultural lands

from being converted to other uses. Many countries have tried to preserve agricultural land from being converted to other uses (Lichtenberg & Ding, 2008) while others have been acting passively or launched inappropriate plans to control ALC.

This study explored these drivers based on a stakeholder assessment for the case of Northeast Iran.

4 Agricultural land in Iran: rapid change

The study area is located in Northeast Iran and called the Khorasan-e-Razavi province (Fig.1). According to Iran's Statistical Center, this area covers 11.6 million hectares (116,000 km2) and includes 5,994,402 people, which is about 7 percent of the country's population. About 28 percent (1,683,192 people or 281,857 households) of the population lives in rural areas, which as of 2011 include 3,335 villages. Compared to 15 years ago (1996), this amount has fallen more than 10 percent. More than 64 percent of the people living in the villages are engaged in agricultural occupations. About 2.32 million hectares of rural land are under cultivation (for agricultural productions). Based on Iran Agricultural Land Organization (IALO) data, legally or illegally, about 2,435 hectares of agricultural lands of this province have changed to other uses between 1995 and 2010.
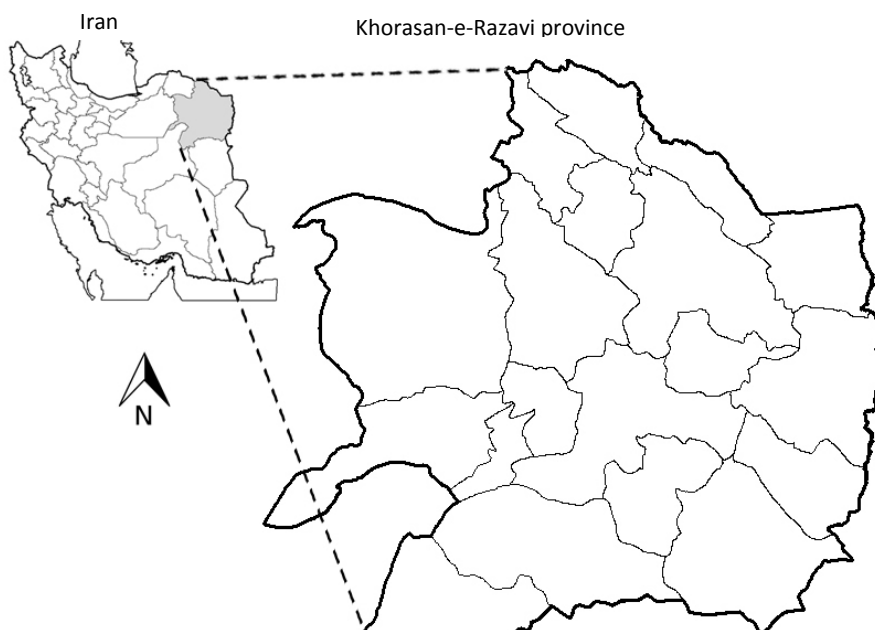
Figure 1. The study area.

5 Drivers of agricultural land conversion

According to the policy makers interviewed, the trend of ALC during current decades has intensely increased and will be on the rise. They mentioned twelve causes for this trend, among which the most important factor was realized as "low profit and high risk of the agricultural sector", which all the policy makers remarked on. This factor is followed by two other important factors, which are "government abandonment of the agricultural sector" and "migration from rural to urban areas".

Table 1. The main driving forces of ALC and their importance according to the policy makers.

ALC drivers	Categories	%	Sum	Mean	Std. Deviation
1. Low profit and high risk of the AS	Eco	100	25	5.00	0.00
2. Government abandonment of the AS	PolIns	80	17	4.25	1.50
3. Migration from rural to urban areas	Soc	60	12	4.00	1.00
4. Existing gap between urban and rural development	Soc	60	10	3.33	0.57
5. Unfamiliarity of advocates with land conservation laws	PolIns	40	8	4.00	0.00
6. Developing the settlements, industrial areas and transportation infrastructure within the agricultural high quality lands	TecInf	40	9	4.50	0.70
7. Uncontrolled increasing of land prices	Eco	40	8	4.00	0.00
8. Inconsistent government policies on AS	PolIns	40	7	3.50	0.70
9. Instability of Iran's Agricultural Land Organization, Judiciary, and Police systems to deal with ALC	PolIns	40	6	3.00	0.00
10. Lack of agricultural water	Env	20	5	5.00	0.00
11. The lack of a suitable cropping patterns	TecInf	20	4	4.00	0.00
12. Lack of enough experts and facilities (fuel, vehicle, etc.) for monitoring and auditing of agricultural lands	TecInf	20	3	3.00	0.00

- Eco: Economic
- PolIns: Political and Institutional
- Soc: Social

- TecInf: Technical and Infrastructural
- Env: Environmental
- AS: Agricultural Sector

Although there is no consensus on the characteristics of farmers who are more willing to change their agricultural lands among the interviewees, there are three general agreements: first, the farmers who changed their agricultural lands may belong to both small and large-scale farmers. However, poor farmers have no choice to change their agricultural lands because they are pushed to do so while rich farmers are never pushed to convert their land and mainly do it to gain more benefits. In other words, given that poor farmers have no other income and resources other than their small plot of land, they remain vulnerable to the impact of ALC, whereas rich farmers try to control such impacts. Most of the interviewees believe that the smallholders will be more affected by ALC because after converting their agricultural lands, they are often more marginalized in urban areas where they have to live in an urban subculture which is a more passive way of living in a society. In case they still prefer to remain in rural areas, their social status will severely decline because they will have no land any more. Second, more educated (especially those with a college education) and younger farmers are more likely to change agricultural lands since they are more capable of understanding the drivers of ALC. Finally, farmers who are members of government bodies (such as the village council or governor of a rural district) are more probable to go for ALC since they have more authority to receive the permission of their ALC.

6 Responding to land conversion

As shown in Table 2, according to the interviewees the main governmental coping strategy to deal with ALC was "giving real priority to the agricultural sector and developing a long term programme for agricultural development". As evidenced by the standard deviation of this strategy (SD = 0), all the interviewees had an agreement on the strategy. Also, the next most important governmental coping mechanism was realized as "legislation based on the social, political and cultural realities of

the society to prevent separation of agricultural lands and the registered land deeds". This mechanism was emphasized by 80% of the interviewees.

Table 2. The main governmental coping strategies to deal with ALC.

ALC governmental coping strategy	Categories	%	Sum	Mean	Std. Deviation
1. Giving real priority to the agricultural sector and developing a long term program for agricultural development	PolEco	100	25	5.00	0.00
2. Legislation based on the social, political and cultural realities of the society to prevent separation of agricultural lands and the registered land deeds	LegLaw	80	13	4.33	0.57
3. Implementing agricultural protection policies (insurance, guaranteed purchase and guaranteed prices)	PolEco	40	9	4.50	0.70
4. Institutional reform of the agricultural ministry and organizations	InsInf	40	7	3.50	0.70
5. Preventing agricultural lands from the settlement of industrial areas and the transportation sector	InsInf	40	10	5.00	0.00
6. Preventing the expansion of villages to towns and townships	PolEco	40	9	4.50	0.70
7. Transferring non-agricultural capital and investments to suitable (non-agricultural) lands	PolEco	40	8	4.00	0.00
8. Implementing the proper watershed management plans for the conservation and development of water resources	Tec	20	4	4.00	0.00
9. Providing human resources with specialists	Tec	20	4	4.00	0.00
10. Developing a suitable cultivation pattern for the country's agricultural sector	Tec	20	5	5.00	0.00

- PolEco: Political and Economic   -   InsInf: Institutional and Infrastructural
- LegLaw: Legal and Lawful   -   Tec: Technical

Half the interviewees believed that farmers have no coping strategies to face ALC; however, the other half believed that the main farmers' coping strategies are: "preventing land fragmentation", "using new technologies such as sprinkle and trickle irrigation systems" and "rehabilitation and the promotion of participatory approaches in agricultural production" (Table 3). Moreover, "increasing the profitability of the agriculture sector", "educating the laws of agricultural land use to farmers"; "reforming inheritance laws and registration of deeds in order to prevent lands from fragmentation"; and "resolving the problem of instability and overlapping the tasks of the institutes and the organizations which operate in the field of agricultural lands" were other suggestions of the interviewees. As shown in Table 3, there are other suggestions on which the majority of policy makers were not agreed.

Table 3. The main farmers coping strategies to deal with ALC.

ALC farmers coping strategies	Categories	%	Sum	Mean	Std. Deviation
1. Increasing the profitability of the AS	PolEco	80	20	5.00	0.00
2. Educating the laws of agricultural land use to farmers	Tec	60	13	4.33	0.57
3. Reforming inheritance laws and registration of deeds in order to prevent lands from	LegLaw	60	13	4.33	0.57

fragmentation					
4. Resolving the problem of instability and overlapping the tasks of the institutes and the organizations which operate in the field of agricultural lands	Ins	60	10	3.33	0.57
5. Appropriate legislation to define ALC as a criminal act	LegLaw	40	9	4.50	0.70
6. Resolving the conflict between basic low and judicial lows of land use and land ownership.	LegLaw	40	8	4.00	0.00
7. Reforming the Agriculture Land Organization	Ins	20	5	5.00	0.00
8. Designing a suitable cultivation pattern	Tec	20	5	5.00	0.00
9. Providing low-interest financial loans for farmers	PolEco	20	4	4.00	0.00
10. Providing adequate facilities for urban people to prevent the destruction of agricultural land with them	Ins	20	3	3.00	0.00

- PolEco: Political and Economic   - LegLaw: Legal and Lawful
- Tec: Technical   - Ins: Institutional
- AS: Agricultural Sector

7 Understanding the combination of driving forces behind land conversion

According to the results of this study, the ALC is increasing severely in the northeast of Iran. The main driving forces are realized as five groups: a) Economic, b) Political and Institutional, c) Technical and Infrastructural, d) Social, and e) Environmental. All these five groups have effect on ALC and each other. On the other hand, ALC may also have an effect on these forces (Fig. 2).
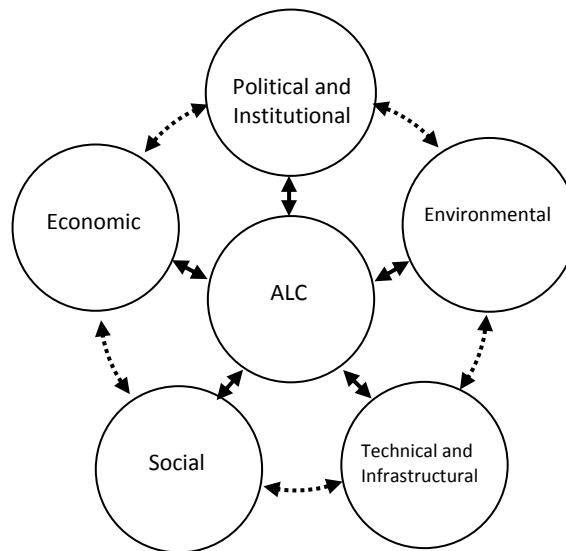

Fig. 2. The schema of ALC and its driving forces.

The main economic driver identified was "low profit and high risk of the agricultural sector". "Migration from rural to urban areas" was the most important social driver noted; and "government abandonment of the agricultural sector" was realized as the most important political and institutional driver. Among the technical and infrastructural factors, "developing the settlements, industrial areas and transportation infrastructure within the agricultural high quality lands" was seen to be more important than the rest. Finally, the only environmental driver emphasised was "lack of agricultural

water". Although, all of these drivers are important, depending on the temporal and spatial profile of a given society, the weight and effect of each driver can be different (Fig. 3).
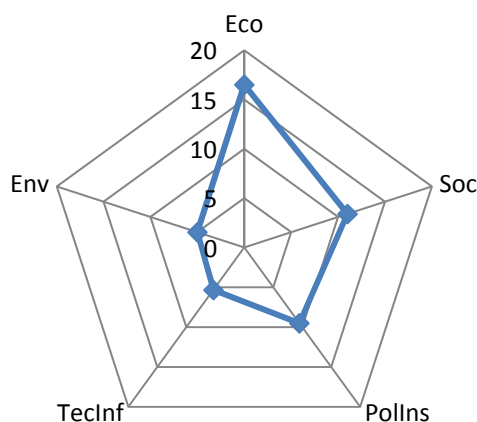

Fig. 3. The importance of the ALC drivers from the view of the policy makers.

Although the characteristics of the farmers who changed their agricultural land use are different, the younger and more educated farmers change their land use easier than the others. In addition, the membership of the farmers in the state agencies can have a positive impact on ALC. Furthermore, the ALC has more negative impacts on small compared to large-scale farmers because changes in land use can increase the vulnerability of poor farmers who lose their lands. By losing their lands, the social status of farmers will decline, which often results in migrating to urban fringe areas. This makes the poor, poorer and more marginalized than before (Azadi et al., 2011b; 2012).

Fig. 4 compares the main governmental and farmer coping strategies to deal with the land conversion. As the figure explains, in the view of the policy makers, the government and farmers have different responses. Both the government and farmers identify "legal and lawful" processes but also "political and economic" aspects. However, "technical" aspects receive less importance as a governmental coping mechanism (Fig. 4a), compared with "institutional" aspects emphasized as a farmer coping strategy (Fig. 4b).

According to the policy makers (Table 2), "legislation based on the social, political and cultural realities of the society to prevent separation of agricultural lands and the registered land deeds" should be seen as the first governmental coping strategy, whereas "giving real priority to the agricultural sector and developing a long term programme for agricultural development" was the most important political and economic reforms expected from the government. The most important institutional and infrastructural reform was "preventing agricultural lands from the settlement of industrial areas and the transportation sector". Lastly, "developing a suitable cultivation pattern for the country's agricultural sector" was realized as the most important technical reform.

On the other hand, according to the policy makers (Table 3), the main farmers' coping strategies are "increasing the profitability of the agricultural sector" followed by "legislation and law" processes, among which, "educating farmers about the laws of agricultural land use" receives the most attention from the policy makers. In their view, the only technical suggestion was "designing a suitable cultivation pattern". Finally, "resolving the problem of instability and overlapping the tasks of the institutes and the organizations which operate in the field of agricultural lands" remains the most important farmers' institutional coping strategy to deal with ALC.
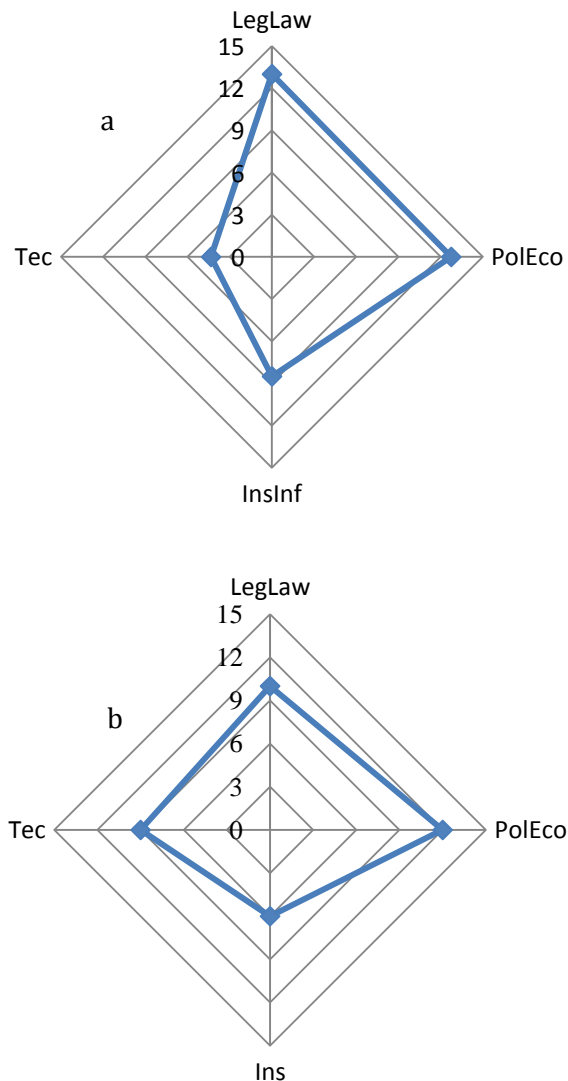
Fig. 4. Comparison of the main governmental (a) and farmers' (b) coping strategies to deal with ALC.

8 Conclusion

According to this study, agricultural land use conversion in the northeast of Iran is on the rise. The causes and drivers of agricultural land conversion are many and this phenomenon is indeed very complex. However, the economic, political and structural drivers are more important in the view of policy makers. Furthermore, although all the drivers are important, depending on the temporal and spatial profile of a given society, the weight and effect of each driver should be assessed carefully. Moreover, the driving forces of ALC affect each other and mutually interact, which should be studied systematically.

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A convergence of factors has been driving a revaluation of land by powerful economic and political actors. This is occurring across the world, but especially in the global South. As a result, we see unfolding worldwide a dramatic rise in the extent of cross-border, transnational corporation-driven and, in some cases, foreign government-driven, large-scale land deals. The phrase 'global land grab' has become a catch-all phrase to describe this explosion of (trans)national commercial land transactions revolving around the production and sale of food and biofuels, conservation and mining activities.

The Land Deal Politics Initiative launched in 2010 as an 'engaged research' initiative, taking the side of the rural poor, but based on solid evidence and detailed, field-based research. The LDPI promotes in-depth and systematic enquiry to inform deeper, meaningful and productive debates about the global trends and local manifestations. The LDPI aims for a broad framework encompassing the political economy, political ecology and political sociology of land deals centred on food, biofuels, minerals and conservation. Working within the broad analytical lenses of these three fields, the LDPI uses as a general framework the four key questions in agrarian political economy: (i) who owns what? (ii) who does what? (iii) who gets what? and (iv) what do they do with the surplus wealth created? Two additional key questions highlight political dynamics between groups and social classes: 'what do they do to each other?', and 'how do changes in politics get shaped by dynamic ecologies, and vice versa?' The LDPI network explores a range of big picture questions through detailed in-depth case studies in several sites globally, focusing on the politics of land deals.

Understanding forms of contention in the post-Soviet setting: rural responses to Chinese land investments in Tajikistan

The overwhelming attention to global 'land grabbing' has paid no heed to recent agricultural land investments in post-Soviet Central Asia. This paper contributes to fill the void and focuses on the rural politics in the context of China's rising presence in Tajikistan's agriculture. I take an actor-oriented inductive perspective to understand the politics of encounter in the context of Chinese agricultural land investments in rural Tajikistan. Global land investments take on different forms in different places, resulting from different investment motivations, local ecological conditions, but moreover from particular encounters on the ground. In this paper, I highlight the frictions that resulted from the dialogue and interaction between Tajik villagers and Chinese investors, which interestingly reveal first of all the relation of rural dwellers to the state. The struggle over land control in Tajikistan hitherto took place in an arena of domestic actors, but in the last years Chinese and Iranian land investors have entered the rural area. However, while grievances over the Chinese presence are observed, they are part of a broader struggle of current land reforms, and there is more fundamental discontent with the current socio-economic environment and land accumulation at large.