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Developing land use scenarios for stakeholder participation in Russia

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ABSTRACT

Land use change, climate change, and the politics of accelerated agricultural growth shape contemporary land use in Russia. This factor combination urgently calls for exploring viable opportunities for sustainable land management in rural areas, which remains low on the political agenda. We address this task by bringing together various dimensions of future land use and state regulation and develop land use scenarios for the Tyumen region in Western Siberia up to 2050. Schematised maps of future land use make the scenarios spatially explicit and stakeholder-engaging. As part of the scenario process, we conducted stakeholder interviews and organised two scenario workshops on the ground. We present the scenarios as a tool that could be used to support participatory processes in a post-Soviet context.

1. Introduction

Russia includes all climatic zones of non-tropical terrestrial ecosystems (Bukvareva et al., 2015), serves as a major carbon sink (MNRE, 2015), and is a key global wheat exporter (FAO, 2016). Since the breakup of the Soviet Union in 1991, the country has been experiencing tremendous changes in agricultural land use. The large-scale agricultural abandonment of 1990–2000 (Kurganova et al., 2014; Schierhorn et al., 2013) is now seeing a partial reversal, expressed in the reclamation of ex-arable land accompanied by agricultural intensification (e.g. Kühling et al., 2016). Key crop-producing regions of European Russia are expected to become drier and warmer by 3–5 °C, with a tripled frequency of food production shortfalls by the 2070 s (Alcamo et al., 2007). These trends can have strong implications for food security, carbon emissions (Schierhorn et al., 2013), and biodiversity (Herzon et al., 2014; Kamp et al., 2015, 2011). Sustainable land management (SLM), understood as the integrated 'management of land, water, biodiversity, and other environmental resources to meet human needs while sustaining ecosystem services and livelihoods' (FMER, 2016), is therefore becoming indispensable to ensure long-term development of rural areas.

However, the current Russian context offers no fertile ground for implementing SLM. The abolishment of central planning in 1991 was connected to profound institutional change. The introduction of private land ownership went hand in hand with the emergence of new rural actors, such as family farms and intermediaries, and new interactions among them (Griewald, 2016). Nevertheless, the previously dominant state and collective farms have persisted, under new organisational forms, as the backbone of Russian agriculture (Franks and Davydova, 2005). The role of the state in agriculture was constantly redefined, but ultimately arrived at increased intervention after initial withdrawal (Wegren, 2009). While a transition phase could have been fruitful for adopting state regulation for sustainability in agriculture (Gatzweiler and Hagedorn, 2002), this approach was not followed. Environmental concerns do not feature among the key directions of today's agricultural policy (State Duma, 2006). Instead, policy is guided by the overarching goal of national food independency (RF Government, 2012; RF President, 2010).

In contrast to the public debates on sustainability in agriculture in Western countries (e.g. Hall et al., 2004), in Russia this topic is not being promoted by bottom-up initiatives. Not only did public environmental debates in Russia quickly dwindle after a short revival in the early transition (Karjalainen and Habeck, 2004). Russian civil society generally suffers from public disinterest (Evans, 2012) and continuing suspicion towards non-governmental organisations (Henderson, 2011). Under Vladimir Putin's leadership, the state has nurtured only those civil society organisations that have supported the policies of the centralised state (Evans, 2013).

The land use context in Russia is thus characterised by multiple dimensions of change, state dominance, and a missing policy

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framework for supporting a transition towards SLM. Against this background, we aimed to find a way that could draw the stakeholders' attention to the social-ecological implications of current agricultural development. Farmers, rural dwellers, agricultural processing and retail firms, academics, non-governmental organisations and state officials were all considered relevant stakeholder groups.

Scenarios have been increasingly used to address environmental and land use issues via stakeholder participation (e.g. Hanspach et al., 2014; Hauck and Priess, 2013; Hulme and Dessai, 2008; Patel et al., 2007). They aim, for example, at exploring potential outcomes of governance reforms (Mitchell et al., 2016) or identifying local opportunities for collective action for sustainable development (Nieto-Romero et al., 2016). Environment-related scenarios also exist for the post-Soviet space (Alcamo et al., 2007; Böhner and Lehmkuhl, 2005; Kotilainen et al., 2008; Sutton et al., 2013; Yakubov and Manthrithilake, 2009), but they are not intended for use in stakeholder engagement processes. This is understandable given the Soviet legacy of missing public participation (Evans, 2006), but stakeholder involvement appears indispensable when addressing such societally relevant and multi-interest issues. Particularly in the environmental domain, centralised decision-making without public participation has proved unable to tackle the pertaining issue complexity (e.g. Beierle, 1999).

Against this background, our study was guided by the following questions:

- What are the long-term implications of current social-ecological trends in rural areas?
- How can scenarios illustrate these implications in a stakeholder-relevant manner?

We developed land use scenarios for the Tyumen region in Western Siberia, where changes in land use and climate pose challenges to long-term rural development and biodiversity. Our scenarios can be employed in initiating participatory processes to bring together various stakeholder groups and encourage reflection on alternative futures.

2. Materials and methods

2.1. Study region

Western Siberia is of global significance in terms of carbon stored in the soil (Degefie et al., 2014). At the same time, the Tyumen region[1] is part of the Western Siberian Grain Belt, where 70% of all grains of Asiatic Russia are produced (Kühling et al., 2016). The region occupies an area of 160,100 km^2 and has around 1.43 million inhabitants. Agricultural lands cover 28% of the region's territory (MED, 2012). The regional landscape is a mixture of arable land, grasslands, wetlands and forests (Kämpf et al., 2016b). Farming takes place predominantly in the ecozones of forest-steppe and pre-taiga (Western Siberian hemiboreal forests), which exhibit a transition pattern particularly sensitive to climate change (Fig. 1).

The Tyumen region is situated in the 'zone of risk agriculture' (Leonard, 2011), with a vegetation period of 160 days (Weking et al., 2016) and poorly drained soils hampering access by agricultural machinery (Kämpf et al., 2016b). Climate change is expected to lead to higher average annual temperatures and an increased frequency of droughts in the south-east of the Tyumen region (Degefie et al., 2014). This will have implications for crop producers and require adaptation strategies, but current regional policy restricts farmers' adaptation (Stupak, 2017).

[1] The Tyumen region (oblast) is a compound federal state, consisting of the identically named Tyumen region (located in the south), the Khanty-Mansiysk autonomous region, and the Yamal-Nenets autonomous region. The latter two areas possess the major oil and gas fields in Russia. The paper focuses on the Tyumen region located in the south of the Tyumen region *sensu lato*.

The Tyumen region is rather representative of Russia regarding both the key crops grown and the predominant farm structures. Grains and leguminous cover 63% of all arable land in the region, followed by forage crops at about 28% (FSSS, 2015). Spring wheat is the main crop, with an average productivity of 2 t/ha in 2009–2013 (TYUMSTAT, 2015). There are three main types of farms. *Corporate farms* refer to agricultural enterprises most frequently registered as joint-stock companies. They are often successors of Soviet state and collective farms and work over 80% of the agricultural land in the Tyumen region (TYUMSTAT, 2015). *Peasant farms* represent a Russian version of family farms and can by law employ relatives from a maximum of three families and up to five non-relatives (State Duma, 2003). *Household plots* essentially refer to subsistence agriculture and comprise less than 3% of the sowing area in the region (TYUMSTAT, 2015). While corporate and peasant farms involved in plant production predominantly cultivate cereals, household plots mainly grow vegetables.

Aiming to choose a scale conducive to stakeholder participation, we selected five districts (*rayons*) as our focus area (Fig. 1): Zavodoukovskiy, Omutinskiy, Golyshmanovskiy, Ishimskiy (west to east) and Armizonskiy (located to the south of the other districts). While all districts have significant agricultural areas, their biophysical and population conditions vary. The districts are located along a climatic north-south gradient and characterised by increasing mean annual average temperatures and decreasing precipitation towards the south-east. The human population size ranges from just over 96,000 citizens in Ishimskiy to only about 10,000 citizens in Armizonskiy, while the population density ranges from 15,8 persons/km^2 in Zavodoukovskiy to 3,2 persons/km^2 in Armizonskiy (TYUMSTAT, 2015).

2.2. Methods

2.2.1. Scenario development: rationale and the process

Scenarios are 'plausible descriptions of how the future might develop, based on a coherent and internally consistent set of assumptions ("scenario logic") about the key relationships and driving forces' (IPCC, 2000).

Our approach to scenario development rested on three key determinants. First, significant land use change, climate change, and intensifying agricultural production were key developments in rural Tyumen. Second, there was little, if any, public debate about the long-term implications of these changes and a virtual absence of stakeholder engagement processes. The latter is a major point of difference compared to the participation context in western countries (e.g. Reed, 2008). Third, the political role of agricultural production in the region is so crucial that any developments that might compromise production growth are likely to be perceived with much caution. 36% of the population live in rural areas (FEDSTAT, 2016), but beyond that, food production is a prominent issue in regional politics given the specific administrative structure of the region. Two autonomous northern regions which are administratively part of the Tyumen region are rich in oil and gas but have virtually no agriculture. The governor of the southern Tyumen region is simultaneously the governor of the two northern regions. The food-supplying mission of the south is frequently emphasised in political campaigns (e.g. TI, 2016), and agricultural production is heavily supported by diverse agricultural subsidies (TO Government, 2012).

It is within this context that we aimed to find a way to raise the stakeholders' awareness of the interconnected social-ecological changes and support them in reflecting upon plausible alternatives. Coming from outside the region, we thereby tried to strike a balance between our role as investigators and as facilitators of local processes (see e.g. Chambers, 1994). As investigators we took stock of the situation on the ground and explored local knowledge and priorities as external observers – e.g. by analysing regional statistics and conducting interviews. In contrast, facilitating local processes implied active interventions in the social actors' environment, in an attempt to communicate