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Unlocking Ukraine's Production Potential

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1 Introduction

This chapter considers the specifics of the agricultural sector in Ukraine as it emerged from the decollectivisation process after independence, a process that resulted in a dualised agrarian economy consisting of large corporate farms and private family farms, many of which largely produce for subsistence. It describes the present conditions in rural Ukraine, and, from this perspective of a dual structure, reviews constraints that inhibit its sustainable development both in general and more specifically in terms of unlocking the potential for wheat production and exports.¹

The chapter is organised as follows. Section 2 deals with the wheat sector in Ukraine. Its farm structure and dualised nature are covered in Section 3. Section 4 focuses on some of the structural, technical and political factors that impede the

¹The chapter draws on an earlier study (Keyzer et al. 2013) that for the first time could capitalise on an extensive set of household and farm surveys collected by Ukrainian statistical agencies (see also Acs et al. 2013). The authors of the present chapter acknowledge the efforts of their colleagues in the research team at the Institute for Economics and Forecasting in Kiev who conducted most of the background work for this study. They also thank the JRC that commissioned the study, in particular Jacques Delincé and Sergio Gomez-y-Paloma. An earlier draft of this chapter was presented by Michiel Keyzer at the JRC workshop 'The Eurasian wheat belt: future perspectives on regional and international food security', Istanbul, Turkey, 20–22 May 2014. Comments by participants are gratefully acknowledged.

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unlocking of Ukraine's farming potential, including the dualised nature of the rural economy, nutrient imbalances, limited access to foreign trade and the wider political context, in particular as regards dualisation and relations with Russia and the European Union (EU).

2 Wheat in Ukraine

Cereals are traditionally a dominant crop in the Ukrainian countryside. The cereals area declined in the late 1980s but rose to a relatively stable level of about 15–16 million ha, which has been maintained to the present, as a consequence of state support. Almost half of the cereals area is wheat and almost half is barley and maize, as shown in Fig. 1. The remainder includes rye, oats, millet, buckwheat and rice.

Wheat production takes place in all regions (Fig. 2), although it is concentrated in the Central Black Soil Region, where very fertile soils and favourable agro-climatic conditions are found, and the south-east regions, where soils are also fertile but where the agro-climatic conditions are less favourable and very variable.

Cereal yields are, however, low compared with EU levels: wheat and barley yields are about 60 % of the EU-27 level, but maize, with its record yield recorded in 2011, falls only 15 % below the EU level (see Fig. 3). This yield gap suggests that there is ample room for improvement of current yields.

Ukraine has made good progress in this regard. Wheat yield in Ukraine had by 2013 risen to 70 % above its level in 2000, whereas the EU-27 Member States achieved only a 10 % increase during that period.

Output variability is also an issue. Given that almost all of Ukraine's wheat is winter wheat, it is highly vulnerable to frost and snow mould in the northern half of the country, whereas the southern regions suffer from droughts owing to the lack of an adequate irrigation infrastructure. Consequently, climatic variation results in large output swings, often around 20–30 % from one year to the next, and under extreme weather conditions such as were seen in 2003, in a decrease of up to 80 %.

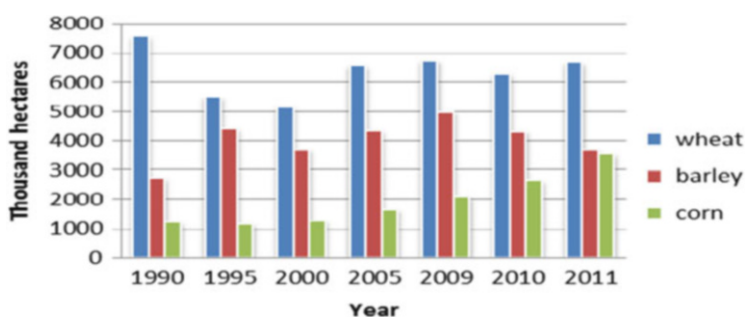


Fig. 1 Cereals area in Ukraine, 1990–2013

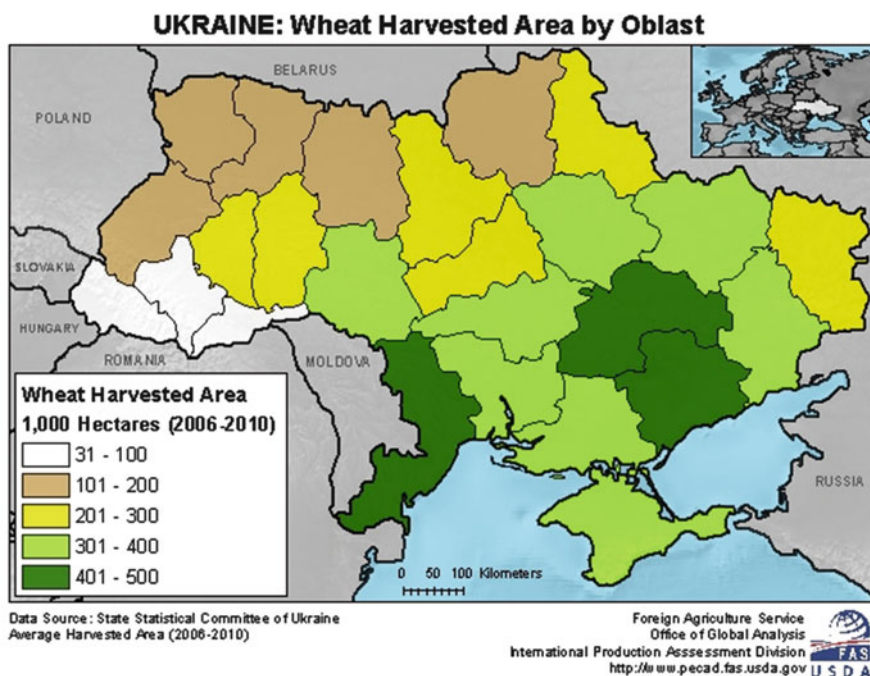
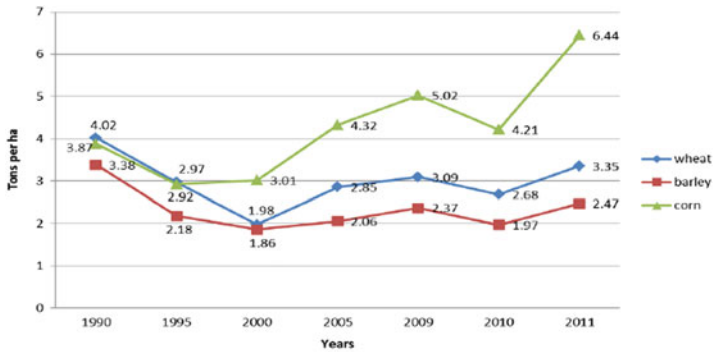


Fig. 2 Wheat harvested area in Ukraine

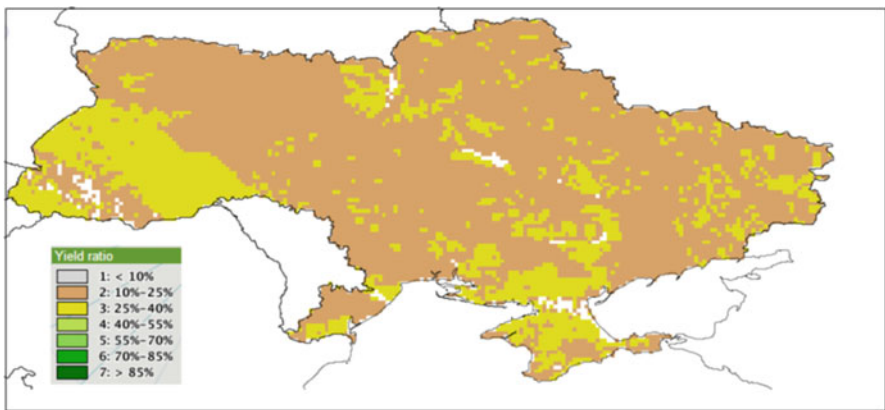
The untapped potential to raise and to stabilise cereal output is, therefore, significant. The global Agro-Ecological Zones study conducted by The International Institute for Applied Systems Analysis and The Food and Agriculture Organization of the United Nations (IIASA-FAO) estimates that this potential is currently realised for 40% of the country only. Figure 4 shows the difference between the actual and potential yield given the current soil and agro-climatic conditions, but with significant investments in modern irrigation technologies, which also need to anticipate expected climate change. Average annual temperature has been increasing significantly in the south-eastern region of Ukraine and if this trend continues, cereal cultivation will shift from the central and south-east regions to the north-west. Climatic conditions will change in the north-west regions as well, probably for the worse. Consequently, strong winds, as well as rains and floods, are expected to affect soil fertility and to reduce crop yields.

A small part of Ukraine's production potential has been realised already, as cereal exports have risen significantly since 2000 (see Fig. 5). This is in part attributable to policy reforms that eased exports, but also to structural changes in agriculture such as a decrease of the area under forage crops and industrial crops (sugar beet, flax, hops) and contraction of the cattle sector, which halved in the 10-year period following independence. About 25% of total agricultural exports now consist of wheat, the trade categories of animal and vegetable oils (primarily



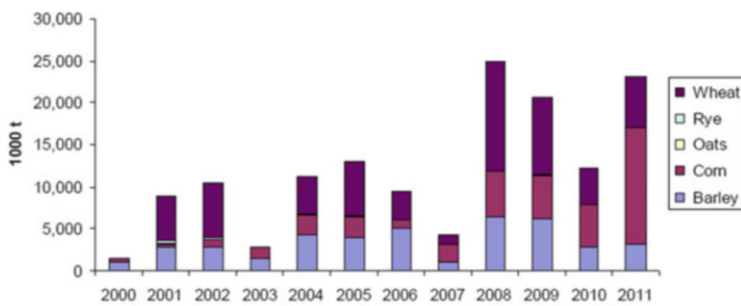
Source: State Statistical Service of Ukraine

Fig. 3 Cereal yields in Ukraine, 1990–2011



Source: GAEZ v3.0., IIASA & FAO 2010 <http://www.gaez.iiasa.ac.at>

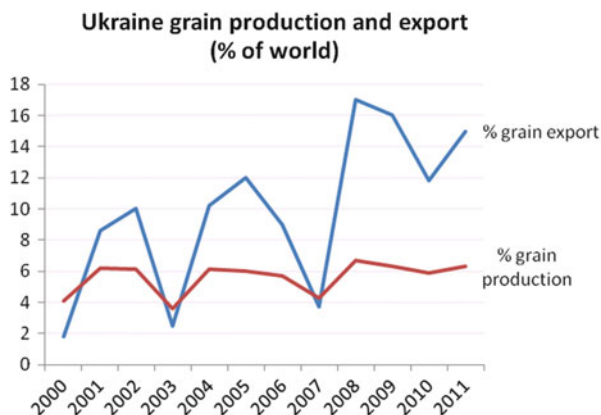
Fig. 4 Ratio of actual and potential wheat yield in Ukraine



Source USDA, 2012.

Fig. 5 Total grain export of Ukraine by crop type (000 tonnes)

Fig. 6 Ukraine grain production and export, 2000–2011



sunflower oil) comprise 26%, oilseeds and fruits (primarily rapeseed) make up 11%, and dairy products account for 6.5%.

Ukraine has become a major player in the world wheat trade, although its produce mostly consists of low-quality grain for use as feed and in biofuel production. Weather-induced volatility in output levels is reflected in export figures (see Fig. 6), whose fluctuations are amplified further by occasional export bans and a far from transparent export licensing system. Under average weather conditions, the export potential of Ukraine is seen to be significant in the near future, because with modest purchasing power in the domestic market, all rises in output can directly be used for exports. Projections with the Aglink model (OECD-FAO 2014) indicate that Ukraine's share in world wheat markets could rise to 20% in the next decade, based on a small expansion of area and a continued yield increase of another 30%.

3 Farm Structure

In Soviet times and shortly after independence in 1991, collective and state farms operated both as corporations and as communal public services. As corporations, they were engaged in crop and livestock production, as well as in numerous support activities, ranging from agricultural processing to industrial production and a wide range of public services in health care, education and entertainment.

The abrupt ending of such corporations after 2000 greatly affected rural areas. Collective agricultural enterprises were officially relieved of their obligation to provide social and community services, and agriculture started attracting industrial, banking and foreign capital and collective farms were transformed into corporations. A dramatic drop in the provision of social services and a loss of guaranteed employment were major consequences of this transformation. Mortality among the elderly increased significantly and as the young left the rural areas for the cities, the already existing demographic imbalance worsened further.

After privatisation and land reform, corporate farms set up land banks that leased private land plots from their new owners. The private land plots that were not rented out were used by rural households as expansions of the already existing household plots. Hence, the present situation is best characterised as a dual system comprising farming households and corporate enterprises.

Of the farming households, peasant farms comprise the smallest number. Their number rose from 35,000 farms in 2000 to 42,000 in 2010, before declining to 40,700 in 2013. Most of them cultivate less than 100 ha. They cover about 20 % of the agricultural land used by farming households. Some households operate large farms (more than 2000 ha) with approximately the same share and extra-large farms (more than 4000 ha), with about 8 % of agricultural land used by farming households. In total, they cultivate 11 % of the entire agricultural area (4.4 million ha) and produce 5 % of the total agricultural production value.

Approximately 20 % of all farming households (1 million) are fully commercial units, oriented on local markets; 40 % of farming households produce both for markets and self-consumption; the rest produce for self-consumption only. The number of plots has dropped from 5 million in 2005 to 4.2 million in 2013; most plots are very small (78 % of households have plots up to 1 ha, 18.5 % have plots up to 5 ha, 2 % have plots up to 10 ha and 1.3 % have plots of 10 ha and more). Units with land plots over 10 ha cover 30 % of all agricultural land used by farming households.

As regards corporate enterprises engaged in agriculture, the shift in ownership is the most remarkable feature. Many enterprises are now owned by a single individual, and were transformed into large holdings by consolidation. Their owners took hold of much of the equipment from the collective farms and gained access to finance, both from within Ukraine and from abroad. This largely happened in an opaque manner, on an informal land market, whereby lease, lease-to-purchase and purchase agreements led to the consolidation of large stretches of farmland by vertically integrated legal entities and natural persons.

At present, over 90 % of corporate farms lease land from private owners, and, in total, 80 % of all arable land is leased (Keyzer et al. 2013: pp. 45–52). Hence, such corporations now cultivate hundred of thousands of hectares, largely for exports. Their access to a wide array of financing vehicles has enabled them to initiate diversified activities along the full product chain, from input supply and basic crop production to agricultural processing and exports.

Despite their mechanised harvesting and ample use of chemical inputs and hired labour, yields of corporate farms remain low by international standards, although they are slightly higher than those of the peasant farms (2.76 t/ha versus 2.19 t/ha, respectively, in 2010), and their unit costs per kg of wheat are slightly higher: UAH 99.60 versus UAH 88.31 per 100 kg, respectively. The relatively low yields and low domestic prices result in gross revenues per hectare of approximately EUR 340 per hectare, compared with a gross revenue of EUR 1500 per hectare in France, which is the top wheat-producing country in the EU, and an average revenue of EUR 1150 per hectare for the EU-27.

In the period 2000–2010, the total number of corporate farms stabilised at around 15,000, but, among them, the number of business partnerships and private enterprises increased from 9,000 to 12,000, at the expense of cooperatives and state enterprises (Keyzer et al. 2013). Since 2010, farm takeover is the main trend in corporate Ukrainian agriculture. Vertically integrated agro-industrial units (agro-holdings) control many other agricultural enterprises, which are independent in name only. By 2013, the estimated number of agribusiness corporations was about 140. They control more than 6000 (40 %) other agricultural enterprises, amounting to 7.8 million ha in total (38 % of all agricultural land used by agricultural enterprises), with hundred of thousands of hectares each. Combined, these agro-holdings produce and sell about half of all wheat produced in Ukraine, more than half of maize and rapeseed, one-third of sunflower seeds, three-quarters of sugar beet, and over 80 % of poultry. They also benefit from their domestic monopoly position in supplying for exports and from special tax privileges. Unfortunately, the revenue earned by them is not spent in rural areas, depriving these of the urgently needed investments in social services, environmental conservation and employment creation.

4 Unlocking Ukraine's Farming Potential

As of winter 2015, given the present tensions in the country, few will immediately associate Ukraine with its great farming potential. However, this potential is there, waiting to be unlocked, in principle for the benefit of all.

Several factors currently impede its realisation, some of which are structural, others technical, and yet others political. These factors can be grouped into four broad categories: (1) the dualised agrarian economy; (2) nutrient imbalances; (3) limited access to foreign trade; and (4) the political context, in particular the relations with Russia and the EU.

4.1 Dualised Agrarian Economy

Since decollectivisation, the dualisation between very large commercial farms and small individual farms has divided rural areas of Ukraine. After independence, Ukraine placed a great deal of emphasis on maintaining strict rules for safeguarding access to land and land use, introducing the so-called Land Moratorium ('Zemelnyi codex'), which gradually led to further legislation that enabled rural and urban households to continue cultivating their own household plots of up to 2 ha for subsistence purposes, as in pre-reform times, but also to sell them. Furthermore, land that had previously been cultivated by the state and collective farms was split and distributed among the eligible population, mostly workers from the collective farms but also employees of the social service sector who lived and worked within

the rural council in which the farms were located. The average land size thus given to a single individual was about 3–5 ha, far less than the maximum of 100 ha that any individual may own. The eligible individuals received a ‘certificate’ stating their personal details and the size of land owned, and a lease market thus emerged. However, as the actual location of the land was unspecified, no one could cultivate plots individually, leaving recipients with no other choice but to lease collectively to the larger holdings operating the full parcel of land.

In response, reforms that favoured further privatisation supported, at great cost, the setting up of a cadastre to locate the individual plots. This, however, neglected other impediments, such as the lack of access to these properties, which were often located somewhere in the middle of a large parcel of land, and were, consequently, not accessible by any road or without any formal right of passage across adjacent plots. It is no surprise, therefore, that most plot owners still lease their plots to large farms for minimal compensation, given that these tenants know the law better and also enjoy monopsony. Hence, almost all of rented land is currently from private households on terms laid down in certificates and acts.

Summing up, the arrangements for land distribution and the Land Moratorium have prevented the fragmentation of holdings into small parcels, and, in principle, the concentration of ownership of former state and collective farms in the hands of few. Lifting the Moratorium could, therefore, have dramatic consequences. First, it could result in the fragmentation of fields into plots that are hardly accessible, with all ensuing conflicts within local communities. Second, moving into the opposite direction, it could result in the concentration by fair as well as unfair means of all property rights by agro-holdings and other large players on the land market.

Rather than simply lifting the Moratorium, dedicated rulings that involve the distribution of land ownership rights are needed: cadastral registration needs to be supplemented by the introduction and registration of other formal titles such as the right of passage and the user rights of commons. This would treat the owners of such plots as shareholders of the full parcel or field or the farm. Shareholders of a large farm do not need to know the precise location of their property within the farm. Explicit cadastral registration of parcels into units smaller than the individual field is wasteful and should be avoided.

Background studies cited in Keyzer et al. (2013: pp. 39–44) also found that land rent is often predominantly paid in kind, if paid at all. This conflicts with official policy that requires land users to pay all due rent to landowners, be they private (e.g. pensioners) or public (e.g. municipalities). Abiding by the rules would strengthen social safety nets, stimulate activities in rural villages and improve the fiscal revenue of local governments.

Furthermore, there is a need to analyse the dual structures using all available agricultural data, including surveys, maps and census data for Ukraine, in accordance with transparent protocols, and to document the sampling frames for each of them, so as to build trust and credibility for the resulting outcomes and for the studies derived from these. This has been championed already (Keyzer et al. 2013), but now seem more topical than ever. An independent and recognisable unit could on a regular basis provide an update of the main developments affecting the

country, initially focusing on agriculture and food security, while paying all due attention to the differences in living conditions and perceived concerns across the nation. Once in full operation, this unit could expand to offer a window for answering specified queries on a larger set of issues, as formulated by a select group of organisations from government, civil society and abroad.

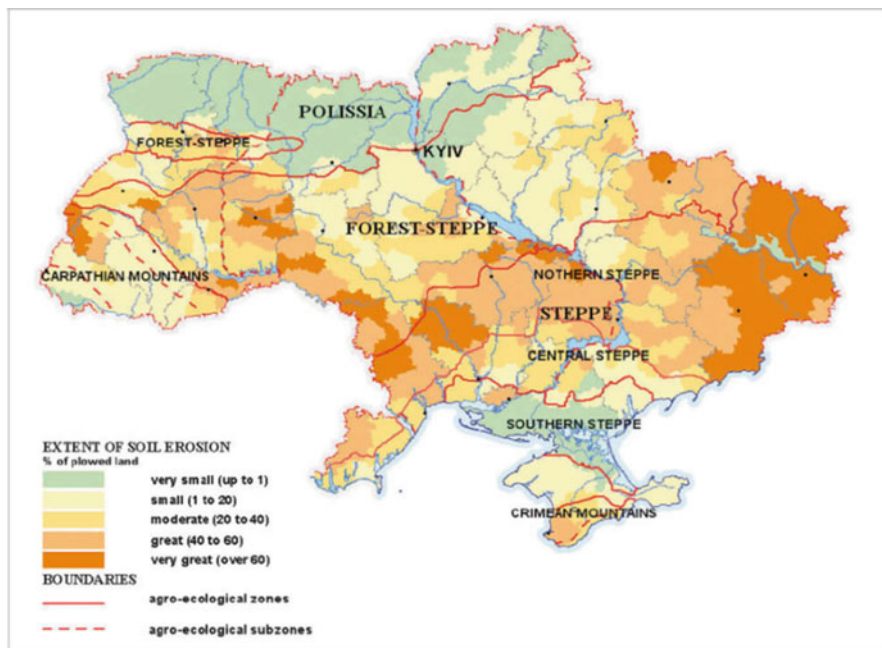
Such an observatory would also be helpful for the timely signalling of new developments that are otherwise noticed too late. A case in point is the monitoring of the position of the agro-holdings which has changed significantly since the Maidan Revolution (February 2014). Political elites have previously argued that these companies are less vulnerable and more effective than smaller ones in view of their economies of scale and scope, at a time at which agricultural prices were rising on world markets. This has led to the assertion that agro-holdings make it possible for Ukraine to become a key player in agricultural markets but also that they will contribute to solving the world hunger problem. However, since the Maidan Revolution, tables seem to have turned significantly, as the difficult political and economic situation has greatly affected the agro-sector and reduced its attractiveness for investment, particularly from abroad. According to the Agrisurvey agency, capitalisation of 15 Ukrainian agrarian companies decreased by more than USD 300 million in 2014. The number of agro-holdings with high risk of bankruptcy is increasing gradually. This dangerous trend may continue, owing to the overconcentration in agriculture, significant rise in costs and difficulties in financing. The causes are many and reach beyond the financial terms of the ventures to include unprofessional management, devaluation of the national currency and galloping inflation. After Maidan, owners of large agro-holdings have only strengthened their influence and representation in government and parliament, enabling them to lobby actively for financial support, tax exemptions and other privileges; however, this increased influence may be insufficient to compensate for the drop in international food prices that were predicted for 2015.

At the same time, the need for public investment to improve living conditions in rural areas is becoming all the more pressing, as growth in urban employment has been stagnating in recent years. Rather than financial support, which the state would hardly be able to provide at present, rural areas would benefit from an enabling legislation that is also effectively implemented to unlock the potential in horticulture, animal husbandry and agricultural processing, as well as from an expansion of household farms, possibly as small multi-household enterprises or cooperatives, on land returned from commercial farms. Rural farm households would also gain much from access to larger plots and access to mechanisation, financial resources and possibilities to renew human capital. This will increase their productivity, functional and organisational capacity and improve the safety and quality of their agricultural products.

4.2 Nutrient Imbalances

Nutrient imbalances have caused soil degradation across large parts of the country (Fig. 7). According to the National Report on Environment, soil erosion affected 57 % of the arable land in Ukraine, of which some 32 % was caused by wind erosion, 22 % by water erosion and 3 % by a combination of both. The loss of organic matter in soils as a result of the excessive removal of crop residues from the fields is in the range of 0.6–1.0 ton/hectare annually.

Ukraine will need significant volumes of plant nutrients to improve and to maintain its crop yields. The supply of nitrogen (N) is solely limited by the availability of energy. Whether Ukraine should import this or produce it by itself on the basis of its own resources is purely a matter of comparative advantage. For the other macro-nutrients phosphorus (P) and potassium (K), the situation is quite different. Both are essential for all life and have no conceivable substitutes. Phosphorus is mined in a major way in only a few countries (primarily Morocco, China and the USA) and deposits are limited. The potassium supply is abundant but the cost of development of new mines is particularly high. Both P and K originate from mineral deposits of mixed composition that are contaminated by toxic metals, in particular uranium and cadmium. Spreading vast quantities of such deposits on Ukraine’s land creates additional contamination; this can be avoided by the



Source: Atlas of Ukraine, 2000, Institute for Geography NASU / Intelligence Systems GEO.

Fig. 7 Extent of soil erosion in Ukraine

purification of fertilisers or by the recycling of organic matter, which also prevents the irrecoverable loss of P as it leaches into rivers and eventually into the sea. The prevention of soil degradation and the improvement of the systems for nutrient supply to the soil are thus important priorities for a country that seeks to realise its potential in a sustainable way.

The problem is particularly relevant for Ukraine because of its nutrient imbalances across the territory, which means that barely any nutrients in animal feed are returned to the land of origin, and because of the size of exports which currently amount to 40% of production. If grain exports rise as predicted, this issue of nutrient outflows will become even more pressing. Any loss of nutrients has to be compensated for eventually, by imports of chemical fertiliser, which will become increasingly expensive, or of organic manure, and by domestic (organic) nutrient recycling. The organic pathway offers the advantage of avoiding recurrent infusion of contaminants. Ukraine is not the only country facing this challenge. All major grain exporters see the nutrient loss/supply ratio rising fast and further concentration of agricultural production at high yielding locations will only accelerate this trend.

4.3 Limited Access to Foreign Trade

Until recently, only a few trading companies that possess export licenses could export smoothly. Access to exports should be made available to all those who deliver goods of adequate quality and not only to specific trading companies. Product labelling on exports, with adequate inspections and with labels satisfactorily meeting social as well as environmental standards, could provide an effective means by which to complement and support local governance.

Ukraine has considerable scope to increase its exports of grain and oilseeds, which might significantly contribute to world food security. However, to effectuate this expansion without amplifying prevailing price volatility, Ukraine will have to enhance its management of irrigation, storage and plant protection, to limit its support to biofuels and to abstain from the imposition of export bans in response to shortfalls.

Keeping its domestic and sea trading channels open is a crucial element of this strategy. Ukraine may have to step up its cereal-handling capacity in the Odessa port region for its important Black Sea trade, given that access to the Crimea is now blocked. More importantly, trade access in general depends on the willingness of importing countries to trade, and, as such, Ukraine must maintain good relations with its trading partners.

4.4 Political Context: Seeking Trilateral Balance with the European Union and Russia

In the course of 2014, the name ‘Ukraine’ itself has in the news media almost become synonymous with border conflict, separatist movements and outside interference in internal affairs. Its eastern regions, which were previously known for coal mining, steel and vast spaces, have turned into battlefields. We cannot neglect this, of course, although the issue goes far beyond the remit of the study on which this chapter is based, which was published in 2013 and for which the present chapter is an inevitable post scriptum. However, whatever the present tensions, Ukraine has a given geographical position, with corresponding resource endowments and locational features that any peaceful settlement will have to account for, since it surely must build also on the country’s strengths, rather than on its vulnerabilities only.

Ukraine is positioned between two far bigger neighbours (the EU and Russia). Whatever the present vicissitudes, it has in the future to maintain trade relationships and cultural and historical links with both, in various fields. Some balance has to be found that is largely agreeable to all three parties.

As regards its relationship with the EU, Ukraine wants to improve the access of goods and services. After independence it started a process of defining its relationship as a new neighbour to the EU, which in 2014 resulted in an Association Agreement, which is a treaty that establishes a political and economic association between the two parties. Each is committed to cooperate and converge economic policy, legislation and regulation across a broad range of areas, including equal rights for workers, steps towards the visa-free movement of people, the modernisation of Ukraine’s energy infrastructure and access to the European Investment Bank. The so-called Deep and Comprehensive Free Trade Area (DCFTA) is an integral part of the Association Agreement, which will define a free trade area over a period of 10 years. The DCFTA may seem a remarkable outcome given that it has been under negotiation now for over 15 years, during which period it has faced strong opposition both in Ukraine and the EU, and it could have resulted into a trade agreement that accommodates only one of the many options the EU can offer. Indeed, the EU’s trade regime is, as is the case for all important trading nations, multi-layered. First, the EU grants free access to the poorest countries, under the Everything But Arms protocols. Second, it offers free or preferential access to countries with an Association Treaty. Third, it adopts, as part of World Trade Organization legislation, the Generalized System of Preferences (GSP), which has a long list of tariff quotas to manage trade, mainly for historical or political reasons. Finally, the standard default option is the trade facing so-called most favoured nation (MFN) tariffs. For rogue states, special provisions apply that may block trade entirely.

These trade barriers can be seen as a playing field for ‘economic diplomacy’, as a country such as Ukraine asks for wider tariff quotas and graduation by a shift from MFN to GSP to Association Treaty. The EU also wants, in return, certain requirements to be met, particularly on phytosanitary and environmental norms for

products traded and on wider Ukrainian policies such as the freedom of the press, the independence of courts, the integrity of the democratic process and transparency in the execution of these regulations. The Ukraine–EU Association Treaty in fact requires a gradual convergence to the *Acquis Communautaire*, which defines the complete set of EU standards, norm, laws and regulations. The DCFTA now outlines the path towards free trade. The Treaty has been signed by Ukraine and the EU, and is now passing the process of ratification by the parliaments in the individual EU Member States, envisaged to be concluded in the course of 2016.

At the same time as Ukraine has been negotiating its relationship with the EU, Russia has been actively promoting its Eurasian Union, which also requires convergence between the countries. Hence, Ukraine finds itself confronted with two systems, each with its own requirements for convergence, and it cannot simultaneously satisfy the requirements of the two systems without getting torn apart between both. Finding a way out of this has by now become a geo-political issue. Whatever the outcome of the present crisis, Ukraine's traditional relationships with Russia in trade and otherwise cannot be denied. At more technical level, one may agree that the problems in part result from a logical difficulty that can be resolved rationally.

It takes no King Solomon to reach the judgement that such convergence requirements are problematic and that for (baby) Ukraine's sake, the country should be free to decide about its future for itself, without external interference. The reversal or negation of convergence requirements is not, in fact, difficult. Trade agreements with Ukraine can place demands on traded quantities only and can refrain from imposing any wider requirements on the mode and conditions under which production takes place. Given that precedents abound, and include several agreements between the EU and China and between the EU and the USA, the legalities should not cause much delay in this regard.

5 Conclusions

The potential of the agricultural sector in Ukraine is being considered from the perspective of a dualised agrarian economy, consisting of large agro-holdings and a diversified set of farming households. Dedicated policies are needed to unlock this potential, including a balanced treatment of the dualised system itself, in particular to avoid further concentration and fragmentation, to restore the nutrient imbalances caused by monoculture and increased commodity exports, and to ease and broaden the access to foreign trade. In particular, Ukraine is now preoccupied by its conflicts in the eastern parts of the country, and it needs a rational solution to reformulate its trade and association agreements, both with the EU and Russia, so as to restrict the range of conflicting convergence requirements. Finally, there is a need for close monitoring of the development of rural areas, in particular dualisation, to find ways to address upcoming financial difficulties of agro-holdings on the one hand and to

tailor the regulations of the household farms to local needs, which are now more pressing than ever, on the other hand.

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