



Failure and Reform of Existing Incentives in the Irrigation Sector in the Ukraine

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Summary

Irrigation water availability is currently not a constraining factor to agricultural production in the Autonomous Republic of Crimea, situated in the south of the Ukraine. The sustainability of irrigated agriculture was endangered after the collapse of the Soviet Union in 1991 by the disappearance of a previously secure agricultural market, lack of funding for proper operations and maintenance, and other problems associated with the transitional process. The slow privatization process, coupled with the undefined transition state of ownership and the lack of farmers' funds to pay for service resulted in the breakdown of irrigation equipment and conveyance infrastructure. This note explains the impacts of the transitional process on the performance of irrigated agriculture in the Autonomous Republic of Crimea. It also evaluates the potential impact of various incentive systems (e.g. price guarantee, direct marketing contracts, water user associations, subsidized short term loans for payments of various services and inputs) on productivity and profitability in the sector.

The heart of agricultural production in Crimea is concentrated around the Northern Crimean Canal (NCC) irrigation system. This canal is 402 km in length, with a potential to serve 380,000 ha. It was constructed during the early 1960s to deliver water from the Dnieper River to Crimea. In the remote southern and eastern parts, water must be lifted to an elevation of 100m before it reaches the field. Sprinkler irrigation is the most common water application method.

Water delivery by the NCC has been reduced by a factor of 6 between 1990-2002. The cultivated area decreased by 30%, while the irrigated area has decreased by almost half. This decrease in cultivated and irrigated area led to a reduction in per hectare of water application. The profitability of irrigated agriculture in the current market economy is explained in Box 1.

Box 1 Profitability of irrigation

A cost-benefit analysis of irrigated agriculture was performed for the whole NCC irrigation system. The profitability of irrigation mainly depends on the irrigation technology used and returns to water (which varies among crops and years). On-farm irrigation costs currently accounting for a substantial share (often more than 75%) in total irrigation costs of US\$0.067/m³. Total irrigation costs consist of distribution costs (from water intake up to farm gate) and on-farm costs (from farm gate to the field). Some application technologies, especially those with high fixed costs are too expensive for crops with low returns to water. Average returns to water for winter wheat are US\$0.11/m³, but vary between US\$0.09-0.28/m³ across years. Returns to water are sensitive to crop prices. At a world market price for winter wheat of US\$140/ton (instead of US\$100/ton) returns to water will be US\$0.18/m³ (instead of US\$0.11/m³).

Source: Zhovtonog et al. 2004

The cost-benefit analysis described in Box 1 shows that potential benefits of irrigated agriculture exceed costs, even in the most distant parts of the irrigation system. Apart from the private benefits for the farmer, the irrigation system may also contribute to rural development and social security (which might justify partial cost-recovery). Currently, the poor irrigation performance seems to be caused by reasons other than profitability, which will be explained further below.

Three main causes for the current poor irrigation performance

There are various reasons for the poor performance of the irrigation sub-sector. First, due to the transitional process an officially responsible entity does not exist for on-farm irrigation and drainage infrastructure. The irrigation district manages the irrigation system up to the farm gate. The farmers are the users of the on-farm irrigation system, but they do not

own all of its infra-structure. The ownership of the tertiary network is currently transferred from the State to a Municipality in the vicinity of the farm. A transfer of responsibilities from the State to the privatized farms also takes place. Many farmers lack management experience, though, which results in bad irrigation management practices (Box 2). This situation leads to broken sprinkle equipment and tertiary networks. This is one of the main reasons for significantly lower irrigated area.

Box 2 The transitional process

After the collapse of the Soviet Union, the State farms were reformed into private enterprises, land was privatized, and markets were liberalized. This process is not yet finished, which caused the following problems:

- Policies and legislation are not yet adapted and implemented to the new circumstance. This resulted in insufficient control over farm production means (management, land, labor, capital).
- Lack of entrepreneurship at the farm level.
- Agricultural input and product markets are not well developed.

This reduced the ability of farms to buy inputs and maintain equipment, which in turn lead to reduced outputs.

Source: Roerink 2004

Second, the present institutional set-up of water management in the Ukraine is rather complex and top-down. Many organizations are currently involved in water management, each one with its own specific role and interest. Water delivery between the irrigation district and a farm is based on a contract. Farmers can only receive a contract if they have water rights. Water rights are, however, hard and costly to obtain, as it must pass 12 steps and institutions (Box 3).

Box 3 Water rights

In the Ukraine water is a public property where the state institutions hold the right over water resources. As water rights exist in a bureaucratically managed irrigation system, the practice of water distribution refers directly to the rights in detail (delivery schedule, type of crops, etc.). The Water Code of the Ukraine regulates the normative framework of water rights in the country. The procedure for receiving water rights is complicated and bureaucratic. Water users have to present 12 different documents to be processed and approved by different institutions before they get a water right. It is difficult and costly for small farmers to go through these procedures. Farmers

therefore form associations to use one 'water right' license and to minimize the costs. According to the Water Code, water rights are issued for periods up to 25 years. In practice the period is, however, often only 1 to 3 years, which creates uncertainty about water delivery and acts as a disincentive to apply for rights.

Source: Pavlov 2004

Third, there is a lack of farmers' funds for investments in on-farm irrigation equipment. There is also a lack of incentives for investments by farmers who rent the land. In addition, there is often a shortage of spare parts. Maintenance is only carried out in the case of emergency and there is no money for replacement. The volumetric water charge to farmers is currently based on planned water volumes, and not on the actual amount sold to the farms. Costs of losses and water used for environmental purposes are consequently not recovered. A substantial number of farms have not paid their outstanding debts on water charges, but still receive water. Banks frequently do not even want to provide credit for paying water charges. Revenues from current volumetric water charges do not cover the costs of water delivery (Box 4), while the government is unable to bridge the gap between revenues and costs. This leads to a financially unsustainable irrigation management situation.

Box 4 Partial cost recovery

Current volumetric water charges (US\$0.002/m³ in 2003) do not cover the cost of the system operating in full capacity (i.e. the costs of irrigation when the entire scheme is under irrigation) up to the farms' gate (US\$0.012/m³). Actual expenditures on irrigation water delivery (US\$0.021/m³) exceed the potential cost up to the farms' gate (US\$0.012/m³) due to the current low demand for water (i.e. low 'sales' and high fixed cost). This low demand for water creates a vicious circle of low revenues, inadequate maintenance, and consequently deteriorating irrigation equipment. In some countries, like Romania, delivery of water being only when there is a 'threshold' of a certain amount of irrigation water demand (e.g. when at least 30% of the farmers demand water). It is too expensive for the irrigation agency to fill all canals simply to supply a smallholder at the tail-end.

Source: Hellegers and Perry 2004

As of 2001, farmers were required to make pre-payments to the Irrigation Department for electricity delivery. The same principle was in effect as of

1999 between the Irrigation Department and the state owned Electro Energy Stations. The need to pay the entire assessed electricity cost in the beginning of the irrigation season is one of the reasons that demand for water was reduced. However, since 2001 the situation has improved as the government supports irrigated agriculture by refunding electricity costs of irrigation.

Suggested and partially implemented reforms in the irrigation sector

To break through the current problematic situation, the following steps were suggested and some have been implemented¹:

1. Banks and investors consider investments in agricultural production as a high risk adventure, causing interest rates for agricultural loans to be high. The problems associated with the transitional process, like the lack of farmers' financial ability to maintain or replace infrastructure, can partially be solved by making agricultural production a less-risky adventure for banks to invest in. When risk associated with farm operation is reduced it is easier to attract investments at lower financial costs. Reduction of risks is achieved in various ways:

- One option is government intervention, by using the mechanisms of grain purchases at a fixed collateral price offered by the state, which restrains the seasonal drop in prices (stabilizes prices) and supports farmers financially. The government is currently making collateral advances to farmers, by offering them the right to sell grain to the state's agent at a fixed, but attractive, price. In this process, the farmer does not lose ownership rights for the sold grain until the first of March, and can buy it at any time and resell it at a better market price².

¹ The government uses currently the mechanisms of grain purchases at a fixed collateral price offered by the state. Besides, some farmers grow already under a contract, but that is not adopted on a large-scale yet. Processes have also been started to establish Water User Associations.

² It is, however, questionable whether government intervention could make a difference. Every year the government of Ukraine is late with both future price

- Another option is to grow under a contract between farmers and a contracting party such as a processing industry or a marketing association or broker, reducing the risk involved in marketing. Price fluctuations emphasize the need for managing price risk through some type of forward contract before incurring the large capital investment required for irrigated crop production. Often a fixed price per kg is determined at the beginning of the season for a certain yield per hectare, the remaining yield is purchased on the basis of market prices.

2. Establishment of Water Users' Associations (WUAs) could be helpful for three reasons: (i) as a legal entity to transfer on-farm irrigation and drainage infrastructure; (ii) it could allow farmers, who make use of the same water intake point, to better coordinate activities, and; (iii) it could reduce the large number of contracts between the irrigation agency and water users to one between the irrigation agency and the WUA, avoiding bureaucracy (Box 3) with respect to receiving water rights (Soppe, 2004).

3. Currently there is only partial recovery of the irrigation system costs in water charges. It is often argued that no or low charges help farmers to break through the situation of lack of funds, low yields, less irrigation, and consequent lack of funds. Current water charges are, however, low compared to the value of water to farmers, which means that it is not likely that charges affect water demand. The lack of farmers' funds for investments in on-farm irrigation equipment is the problem.

Therefore, it is suggested to convert the current government subsidies on electricity and water delivery charges into cheap loans to farmers to fund investments in on-farm irrigation equipment. The same is true for the other on-farm investments required to turn irrigated farming into a profitable

formulation and advance payments. Therefore, this instrument would not be useful to farmers, who have to pay in advance for water in spring. It seems that effective commodity exchange systems and forward contracts would be more practical as a solution. Unfortunately, the commodity exchange is still not working (at least effectively) and the forward contracts are still not the established practice.

activity. There is a clear need to consider changing the farm input subsidy programs into loan programs for investments in agriculture.

It is important to note that even with government loans, farmers will only be willing to invest if the following preconditions are met: (i) farmers should feel they own the system; (ii) timely water delivery is guaranteed upon request; and (iii) farmers should feel they can reduce production costs and increase revenues with such investments compared with business as usual. A role for the state in administering such government loans would be strategically helpful.

Conclusion

This note demonstrates that despite the fact that benefits from irrigation exceed costs, there is limited demand for irrigated water in the Autonomous Republic of Crimea because the essential elements for successful irrigation water management are not in place. Due to the current transitional process in the Autonomous Republic of Crimea there is a lack of funds, proper ownership and institutions, resulting in bad maintenance of irrigation infrastructure. Moreover, the procedures for receiving water rights are complicated and bureaucratic. As rights are issued for a short period, farmers cannot make long-term investments in infrastructure. Another reason for the reduction in demand for water is the lack of farmers' funds to invest in on-farm irrigation equipment and the ability to make pre-payments for water (electricity) delivery in the beginning of the irrigation season. Revenues from current volumetric water charges do not cover costs of delivery, while the government lacks the financial means to bridge this gap.

To solve the problems associated with the transitional process, like the lack of farmers' funds to maintain infrastructure, various incentive systems are evaluated. It is suggested in this study to make agricultural production a less-risky adventure for banks to invest in through price guarantees and direct marketing contracts. It is also recommended to establish Water User Associations and change the farm input subsidy programs into loan programs for investments in agriculture.

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Additional Reading

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