

# Strengthening Governance of Public Infrastructure

## Agenda

November 12-15<sup>th</sup>, 2019  
Ljubljana, Slovenia



## WG 1- Case Study – Costing infrastructure projects, Dealing with uncertainty and risks

### Irrigation project to increase production of Potatoes in Pimnia

Given that Potato production in Pimnia is a key source of income for farmers, is an important household consumption item, and has also the potential of becoming an exportable good, the Ministry of Agriculture, Animal & Fisheries, with the technical support of the Ministry of Water and Sanitation, has developed a project to increase irrigation in Paradise Valley.

Project considers building a dam on Rushing River and a network of pipes for water distribution. Some key facts and assumption used for appraising the project are:

- Average production by hectare will be increased from 35 to 50 tons per year.
- Planted surface will increase from the actual 550 hectare to 1600 hectare.
- Government will build the dam, pumping stations a main distribution pipes. And it is expected that farmers will invest on their farms to improve irrigation and plant additional hectares.
- Given the larger scale of production, new machinery will be required for filed preparation and cropping. But due to the high cost, 50% will be subsidized by government.
- Sale price of potatoes, currently at 200 EUR/ton will not be affected by the increased production because the increase is marginal as compared with actual volumes traded.

A project appraisal has been prepared to ascertain if:

- The project as a whole has a positive NPV for Pimnia, therefore contributing to the growth of the country.
- The project has a positive NPV for farmers, in order for them to be interested in investing in irrigation and machinery, and expanding planted surface.
- Analyze impact of project on government finances.

However, there is uncertainty regarding key project assumptions. Changes in the value of these variables can have an impact on project indicators and government financing which can't be neglected. These variables are:

- The cost of capital for project financing, reflected in the Discount Rate.
- The Exchange Rate (EUR/USD), which would affect the cost of imported machines.
- Cost of land per hectare, given the need to buy 250 hectares for placement of dam and pumping stations.

- There is a geological risk which can impact the number of cubic meters of earth moved for construction of dam and the cost per cubic meter of earth moved.
- Geological risk may also increase the volume of concrete needed for the dam.
- There is also some uncertainty regarding the cost of concrete per cubic meter.
- A key variable is also the sale price of potatoes, which will affect farmers' interest in the project and convenience for the country in terms of NPV.
- Finally, the amount of subsidy for acquisition of machinery should be analyzed, to determine its impact in profitability for farmers and on government finances.

### Work to be done

Given the uncertainties associated with the project presented by the Ministry of Agriculture, Animal & Fisheries, Ministry of Finance is interested in analyzing the following aspects:

- Study if changes in key variables, affecting negatively project indicators, can turn it into a bad project for the country (negative NPV).
- Study if changes in key variables could negatively affect project indicators for farmers, discouraging them from investing in their fields and therefore turning government's investment useless.
- Analyze the impact on government finances of risks due to geological factors, cost of land to be acquired, changes in exchange rate, changes in prices, change of subsidy policy and a reasonable combination of these factors.

For this purpose a sensitivity / scenario analysis has been prepared by the ministry, and it should be used to answer the following questions:

- Is the project convenient for the country in all scenarios analyzed?
- Is the project convenient for farmers in all scenarios analyzed?
- Is there a need for the 50% subsidy to machinery?
- What is the worst-case scenario for government finances and what could be done to mitigate it.