Chapter 1: Introduction to Delft-FIAT

This user manual provides detailed instructions for installing, configuring and using the Delft-Flood Impact Assessment Tool (Delft-FIAT). Delft-FIAT is a tool(kit) to **set-up** and **run** flood impact models that are mainly based on the unit loss method. The unit loss method relates flood parameters to damage at the unit level (De Bruijn, 2005[1]). All supplementary material can be found at: https://publicwiki.deltares.nl/display/DFIAT/Delft-FIAT+Home

1.1   Key development pillars

The software is designed and developed with some key pillars in mind:

1. as open software; every registered user can get the source code (python libraries) and use the software for free; Delft-FIAT is based on other open source libraries as GDAL and numpy;
   Delft-FIAT is available as a stand-alone executable or as a set of Python scripts
2. optimal flexibility; users can configure and run models of any place on the earth and may use their own comfortable tools for pre-and postprocessing (basic pre-processing scripts available);
3. optimized calculation core; large and detailed model schematizations are calculated within minutes;
4. easy, flexible and transparent input configuration (e.g. use of Microsoft Excel);
5. includes extendable worldwide flood impact function library;
6. makes use of Open GIS and defacto datastandards; hydro-dynamic software output will work and input and output can be read/write in mainstream (GIS) software;
7. to be used as stand-alone tool (expert) or suitable to run a flood impact model as a web processing service (WPS); specific users can be facilitated by dedicated interfaces;

1.2   Delft-FIAT components

In the figure below you find the basic components to set-up a flood impact model and the possibilities to run the flood impact model. To set-up a flood impact model for your study area, the calculation core needs a model config file (.xls) with references to a folder with object maps (e.g. tiffs), impact functions (.csv) and maximum object values per impact category.
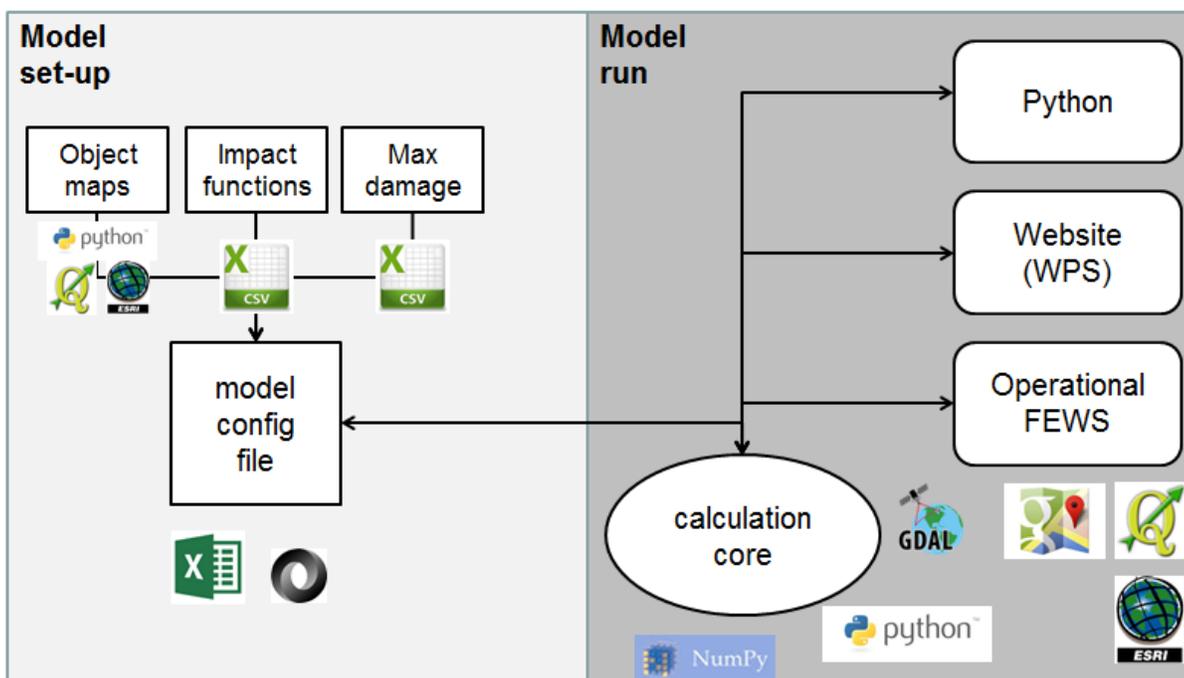

Figure 1.1 Delft-FIAT model components

To run the Flood Impact Model the calculation core can be run using as an executable, a python interpreter, as service a through a website and in an operational flood early warning system (FEWS – see https://publicwiki.deltares.nl/display/FEWSDOC/FIAT+adapter). The calculation core is professionally programmed without a graphical user interface, in order to make custom-made application as easy as possible.

1.3   Example applications with Delft-FIAT

Delft-FIAT is yet applied in several projects as the calculation core:

- for the new SSM2015 model in the Netherlands;

- a case study in EU-FP7-BASE project;

- projects in Turkey;

- Bangladesh Delta Plan 2100 project;

- a project in USA; cases in Florida and New York;

- a project to build an adapter for Delft-FEWS

- Global Flood Analyzer

- Multi-hazard and risk mapping Afghanistan

- Detailed Flood risk assessment for Colombo metropolitan region

- Flood hazard mapping Africa

- Supporting resilience to coastal hazards in Vietnam

as well as several student projects in Cambodia, Bangladesh, India.

1.4   Outline

This manual provides instructions, how:

1) to install and start Delft-FIAT (chapter 2);

2) to set-up a working Delft-FIAT flood impact model (chapter 3); and

3) to run a Delft-FIAT flood impact model (chapter 4).

Finally in chapter 5, several exercises are available to become familiar with the basic functionality of the tool.

---

[1] De Bruijn, K.M. (2005), Resilience and flood risk management: A system approach applied to lowland rivers, PhD Thesis – Delft University of Technology, 2005