



**HAL**  
open science

## Development of an erosion and transfer particulate phase pesticides model at the watershed scale

Tulio Soares-Lima, Nadia Carluer, Michaël Rabotin, Roger Moussa, Claire Lauvernet

► **To cite this version:**

Tulio Soares-Lima, Nadia Carluer, Michaël Rabotin, Roger Moussa, Claire Lauvernet. Development of an erosion and transfer particulate phase pesticides model at the watershed scale. EGU General Assembly, Apr 2023, Vienne (Autriche), Austria. hal-04258064

**HAL Id: hal-04258064**

**<https://hal.inrae.fr/hal-04258064v1>**

Submitted on 25 Oct 2023

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Session HS9.2 – Transfer of sediments and contaminants in catchments, rivers systems and lakes

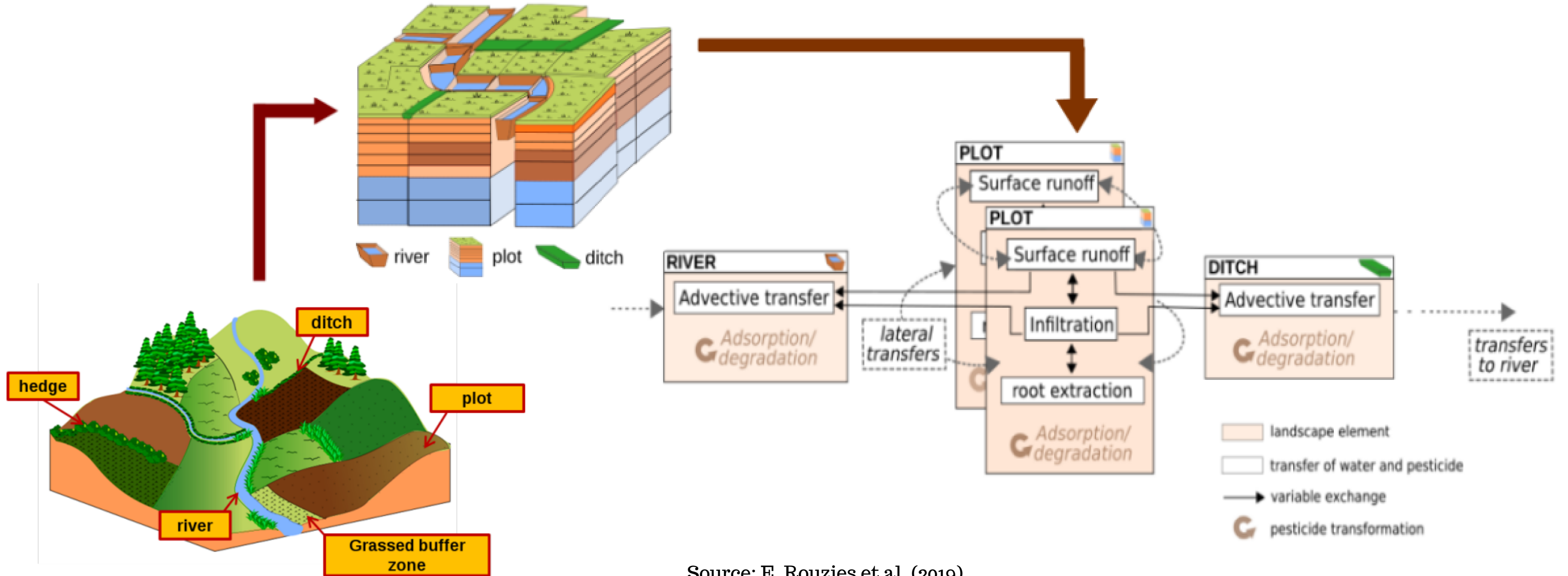
## **Development of an erosion and transfer particulate phase pesticides model at the watershed scale**

**Tulio Lima, Nadia Carluer, Michael Rabotin, Roger Moussa, and Claire Lauvernet**



# PESHMELBA

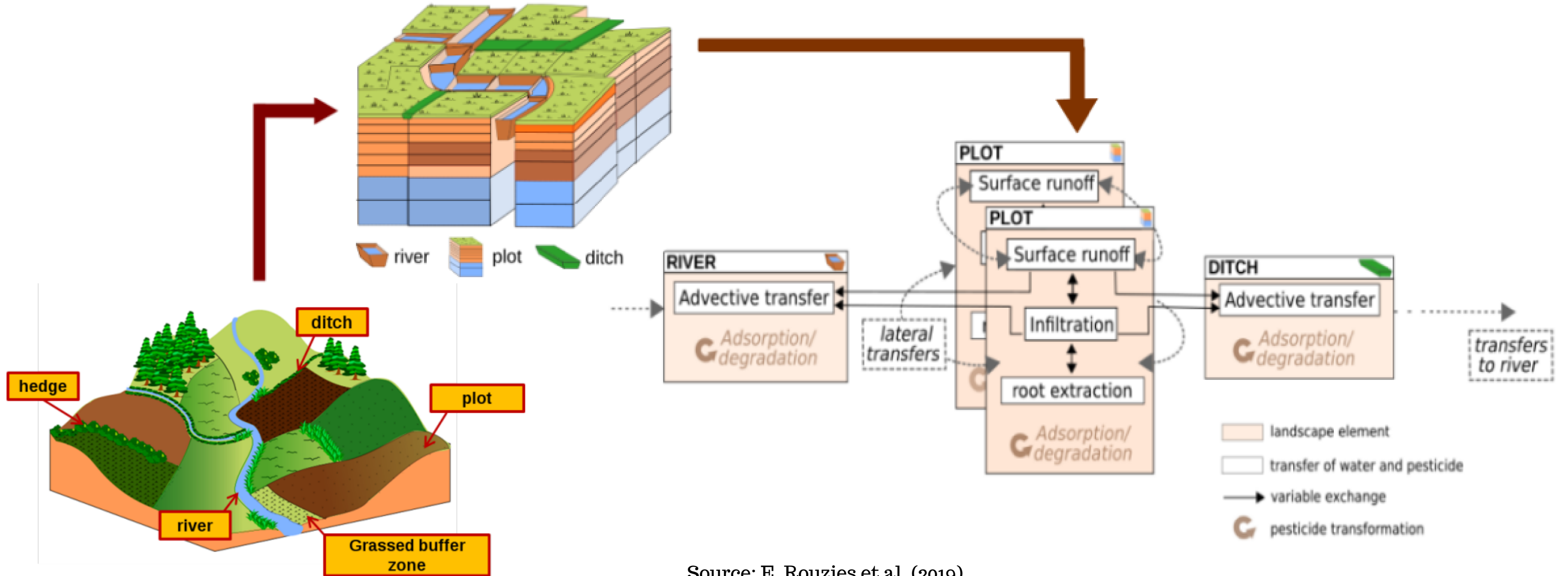
- Simulate pesticide transfers (in solution) and fate on small agricultural catchments
- Simulations of heterogenous landscapes
- Continuous dynamic simulations
- Modular structure to explore landscape management scenarios



Source: E. Rouzies et al. (2019)

# PESHMELBA

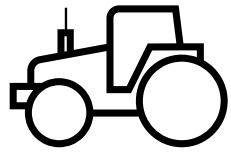
- Simulate pesticide transfers (in solution) and fate on small agricultural catchments
- Simulations of heterogenous landscapes
- Continuous dynamic simulations
- Modular structure to explore landscape management scenarios



Source: E. Rouzies et al. (2019)

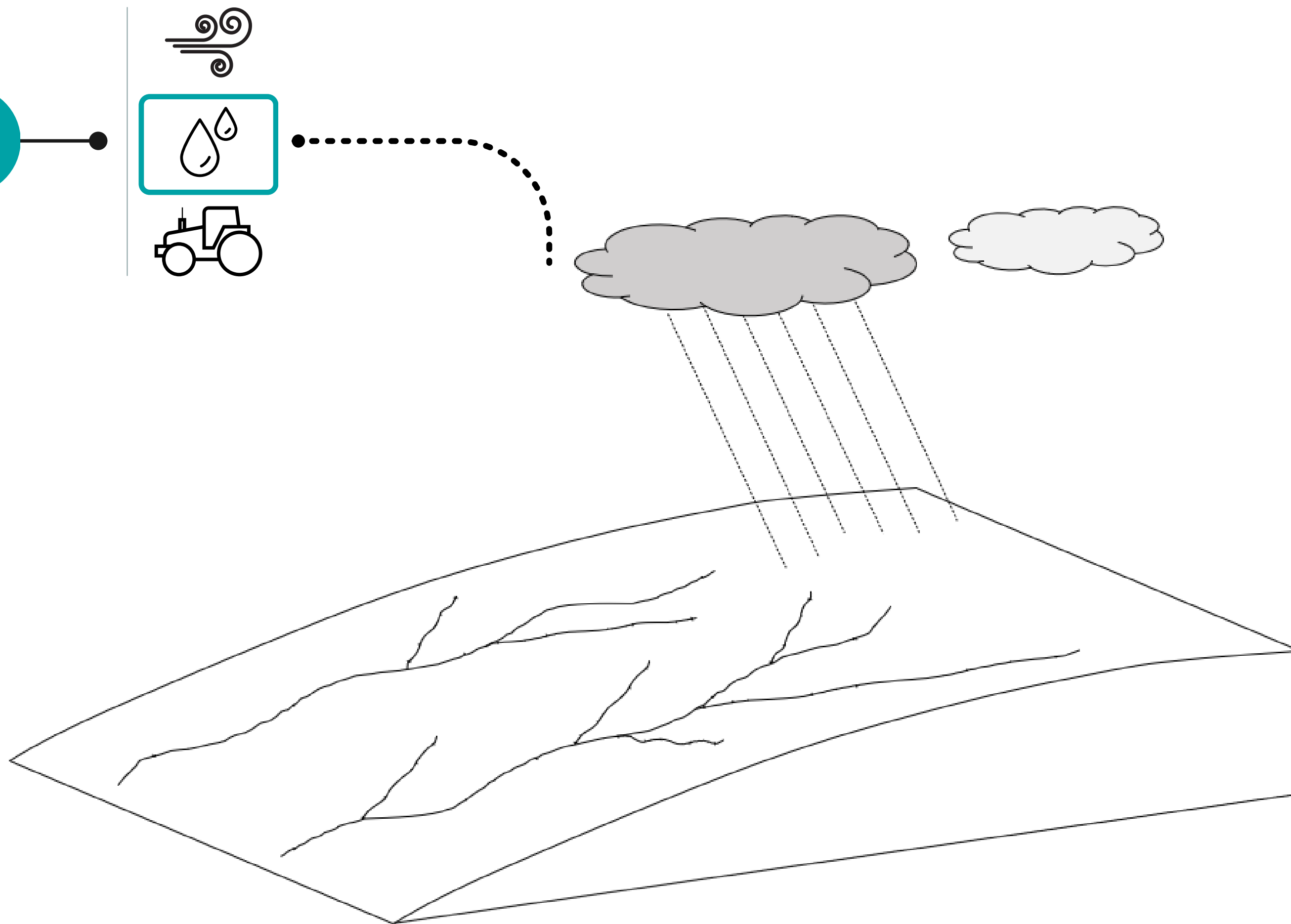
**PESHMELBA**

**EROSION MODEL**



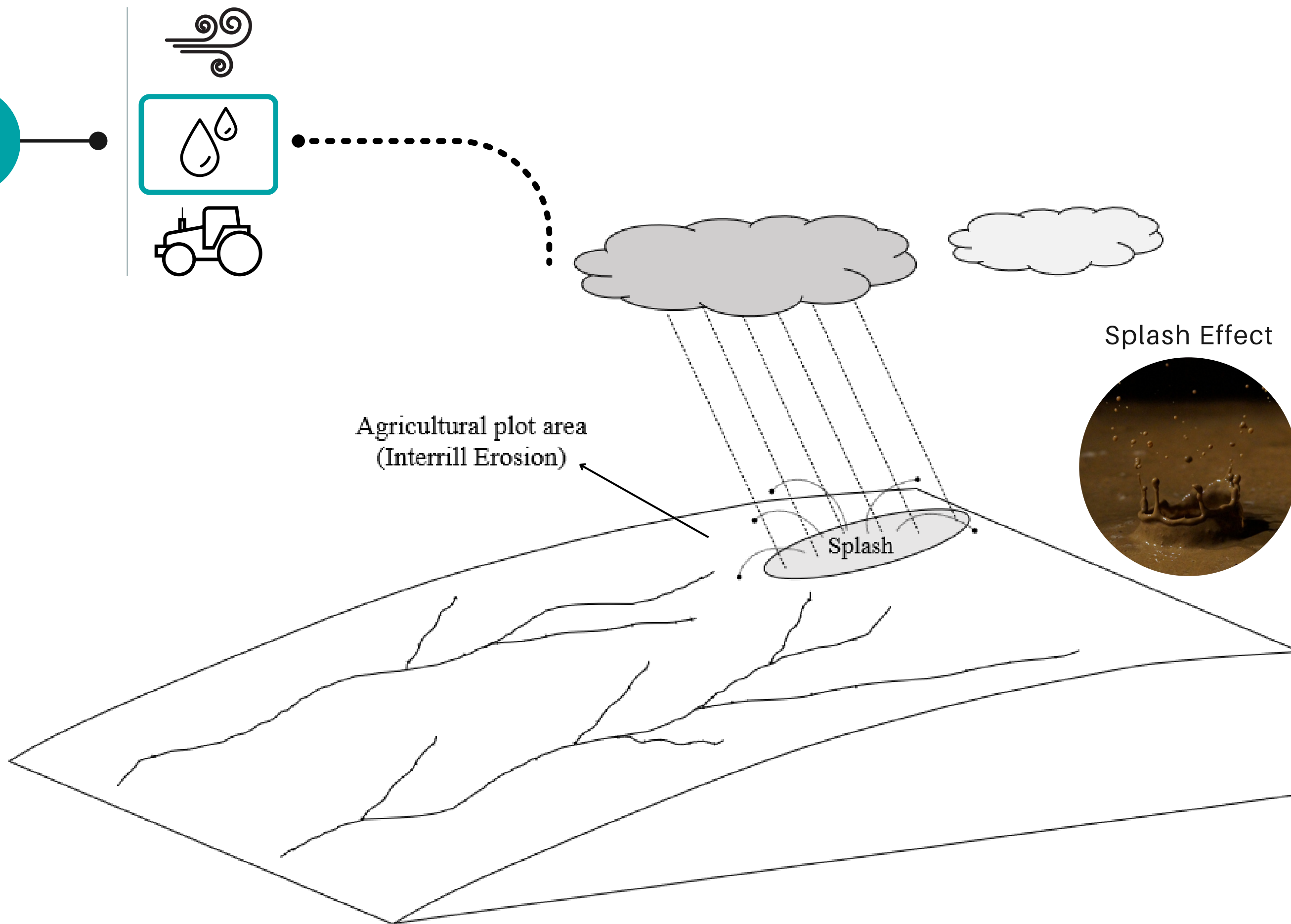
**PESHMELBA**

**EROSION MODEL**



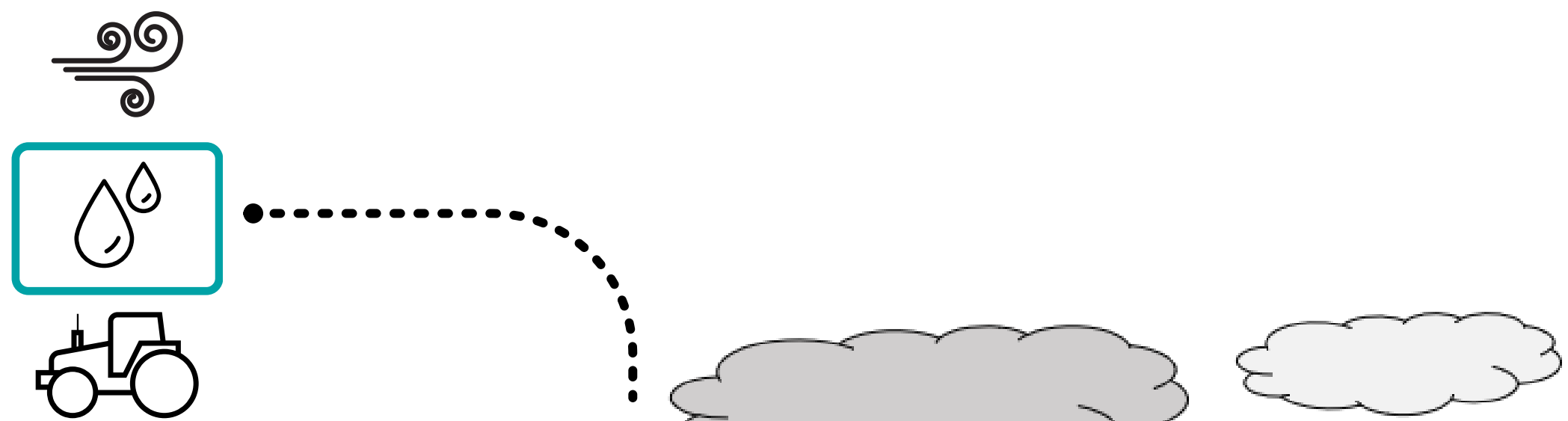
**PESHMELBA**

**EROSION MODEL**



# PESHMELBA

## EROSION MODEL



Rill Channels



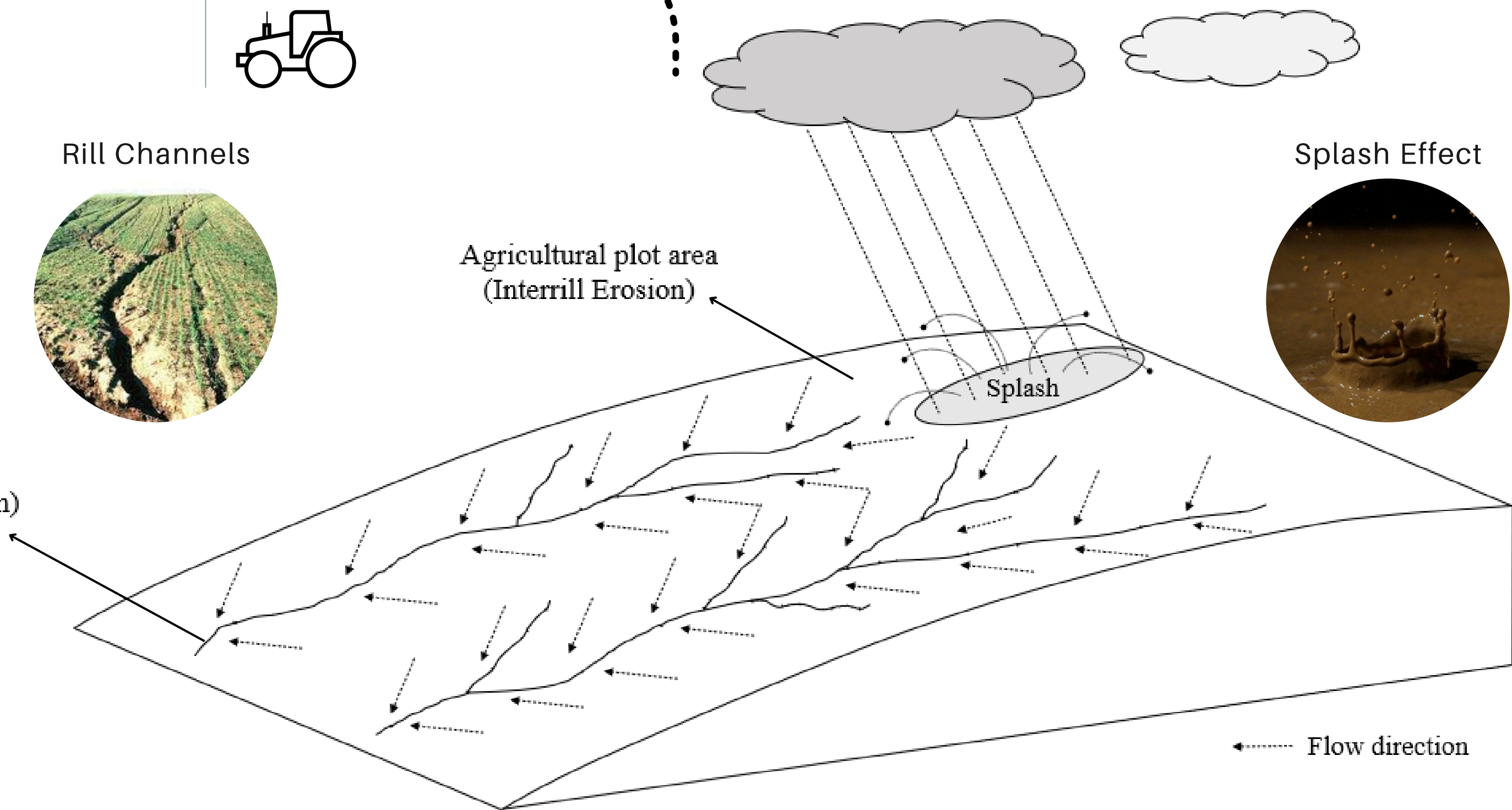
Splash Effect



Agricultural plot area  
(Interrill Erosion)

Splash

Rill channels  
(Rill Erosion and Deposition)



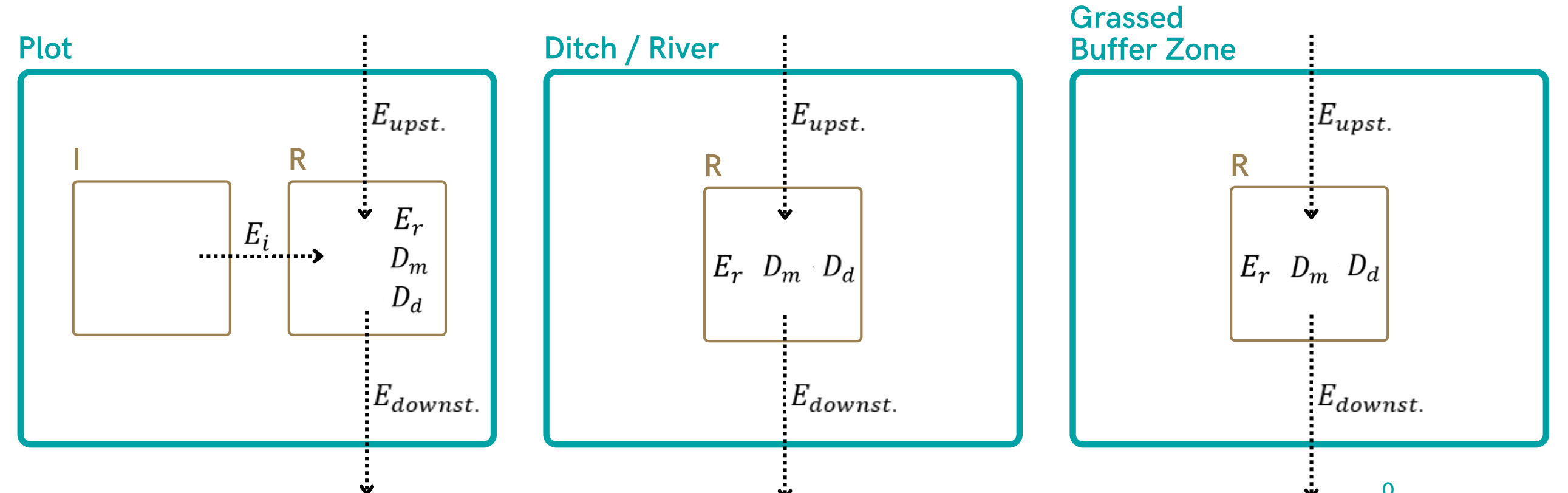
Flow direction



# PESHMELBA

Processes representation for each landscape element:

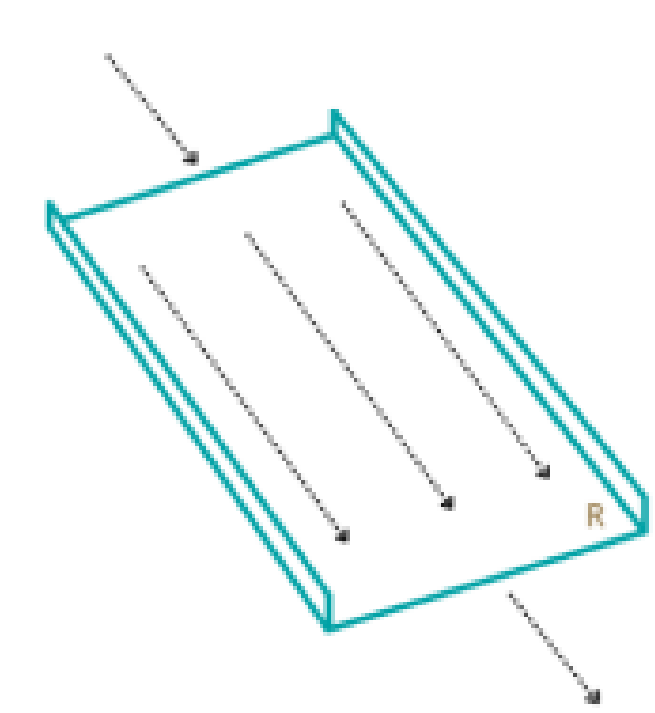
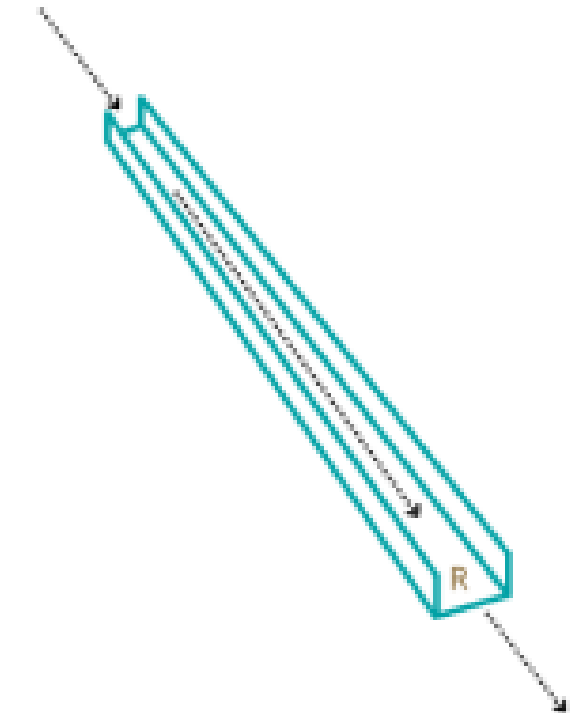
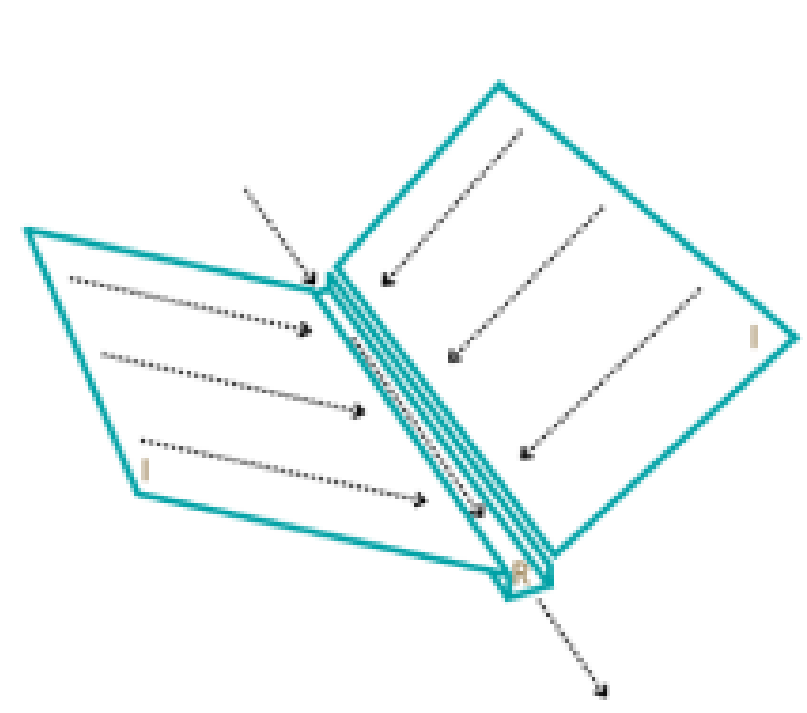
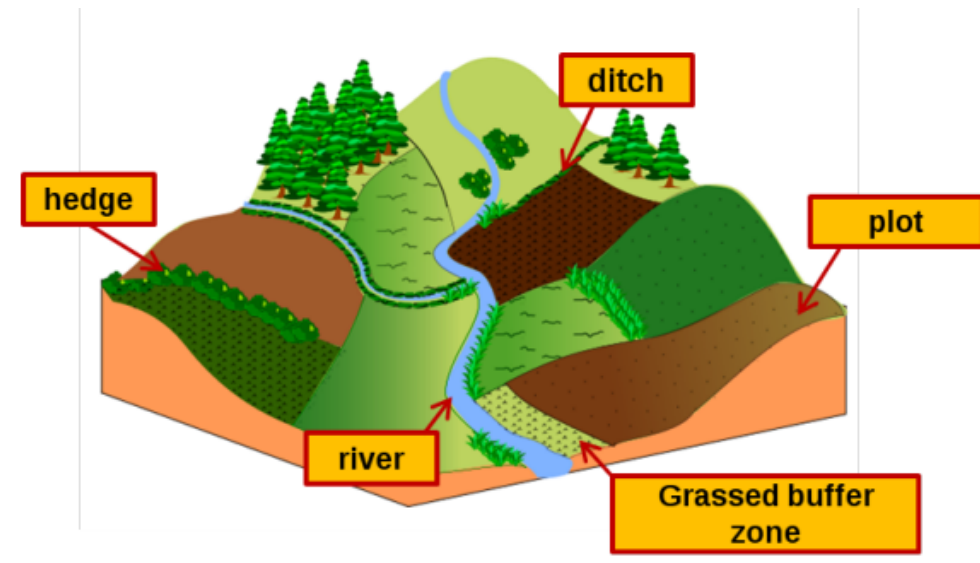
## EROSION MODEL



$$E_{downst.} = E_{upst.} + E_i + E_r + D_m - D_d$$

$$E_{downst.} = E_{upst.} + E_r + D_m - D_d$$

$$E_{downst.} = E_{upst.} + E_r + D_m - D_d$$



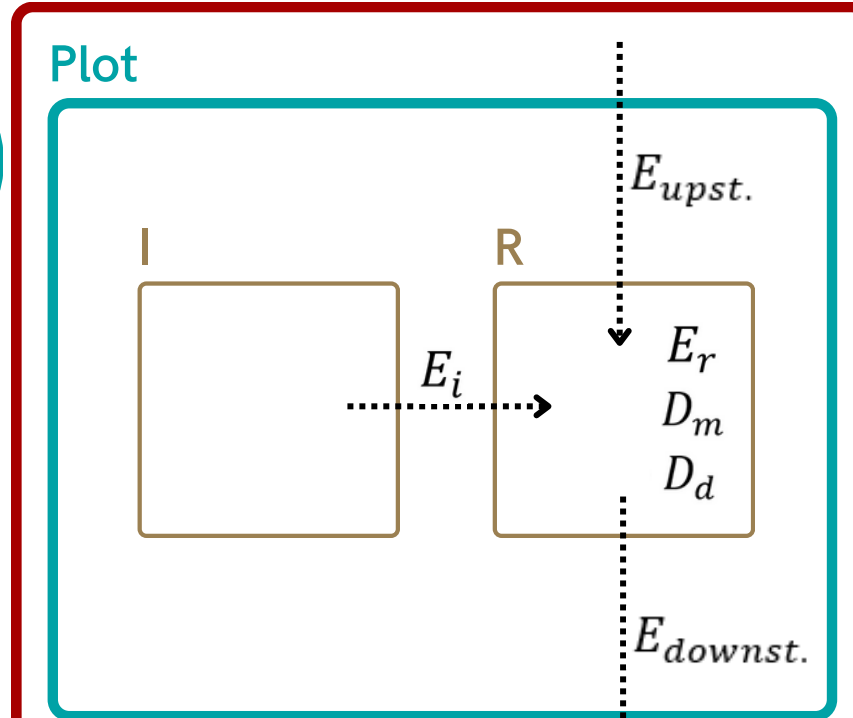
I = Interrill Process ; R = Rill Process

# PESHMELBA

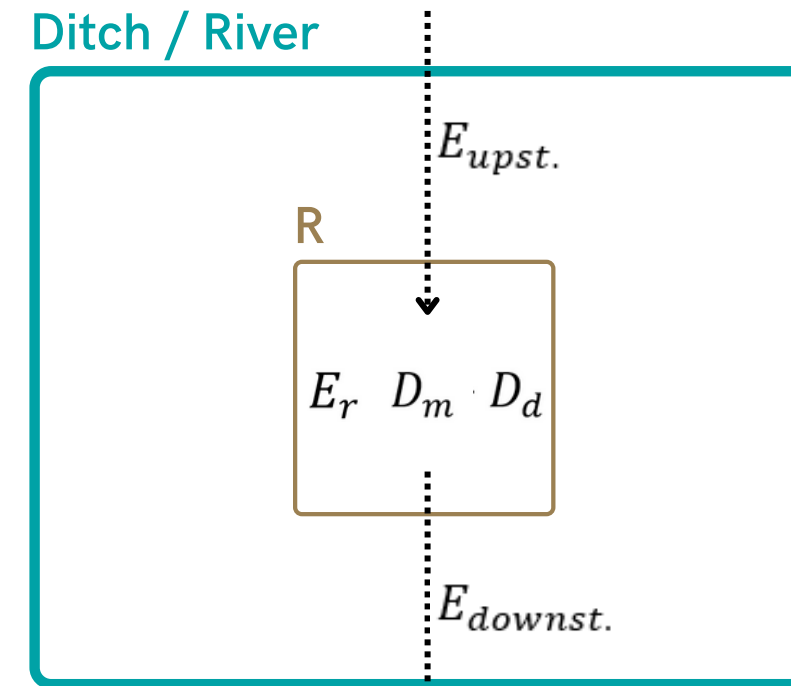
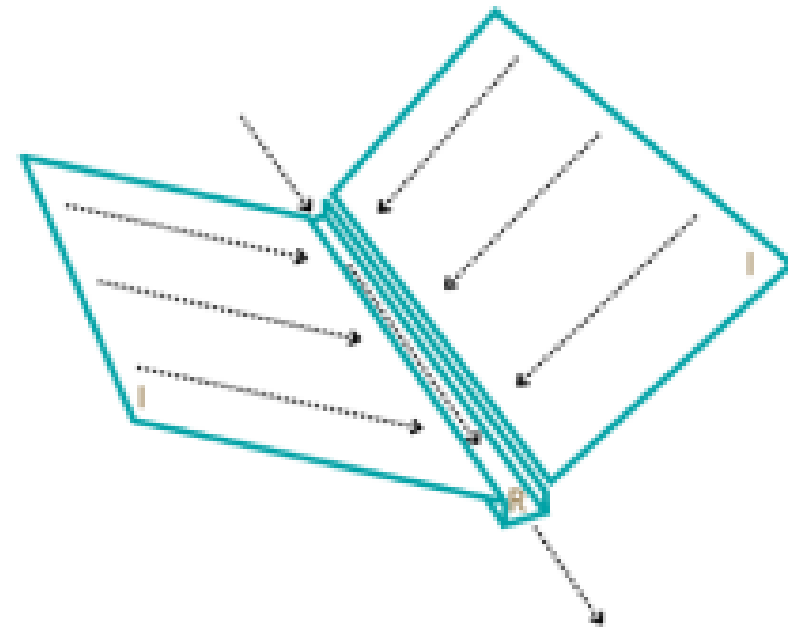
## Processes representation for each landscape element:

### Interrill Erosion, Rill Erosion and Deposition

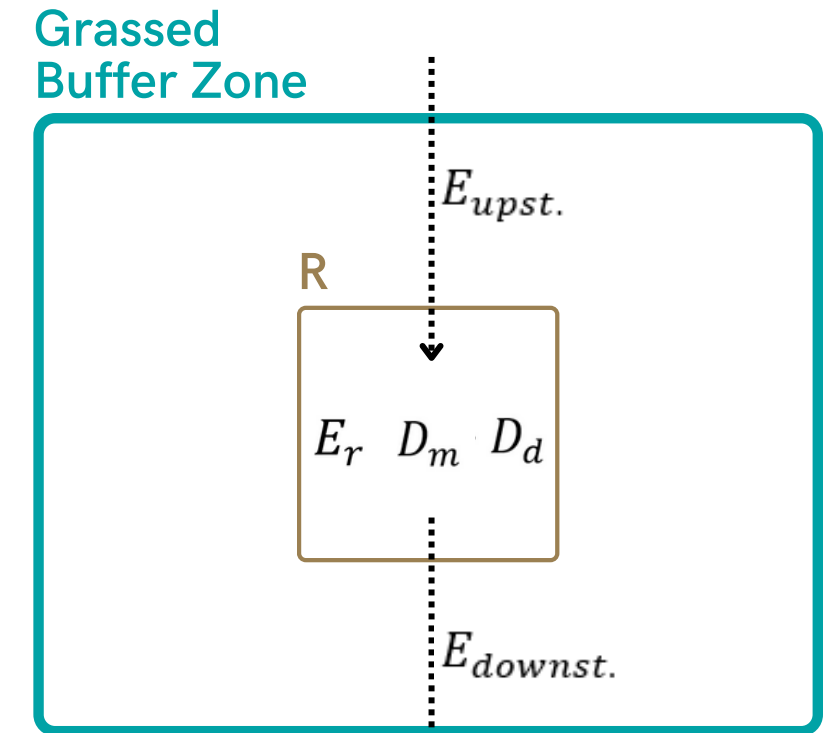
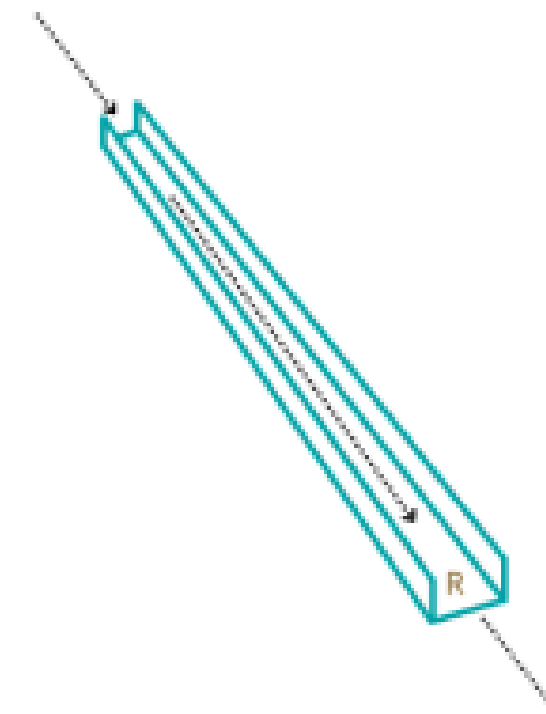
## EROSION MODEL



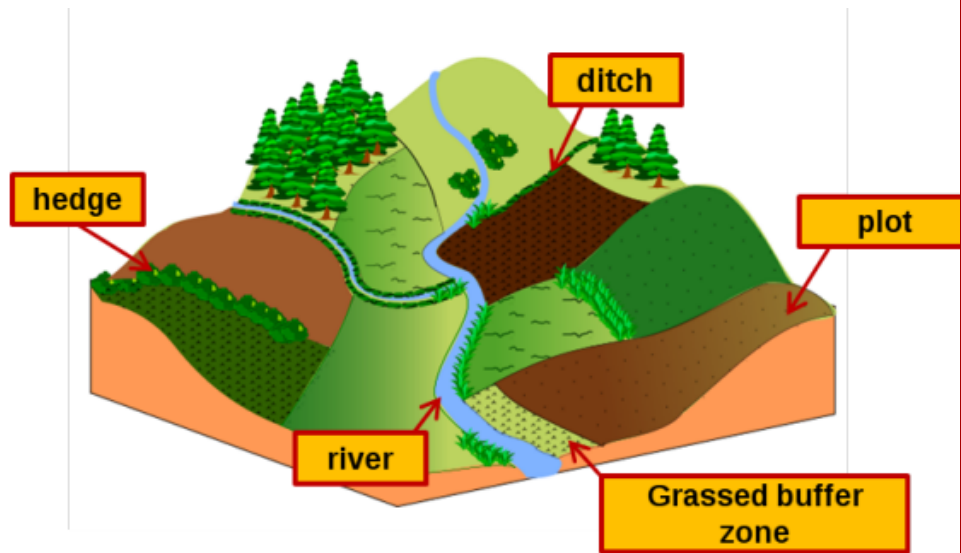
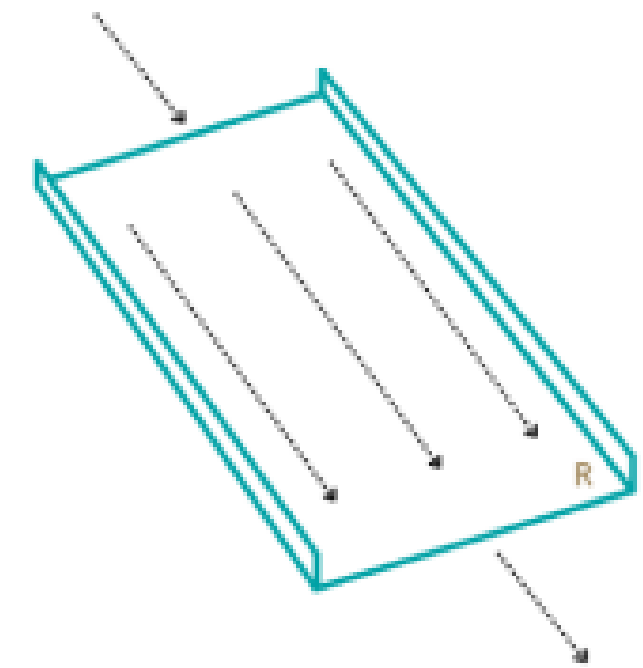
$$E_{downst.} = E_{upst.} + E_i + E_r + D_m - D_d$$



$$E_{downst.} = E_{upst.} + E_r + D_m - D_d$$



$$E_{downst.} = E_{upst.} + E_r + D_m - D_d$$

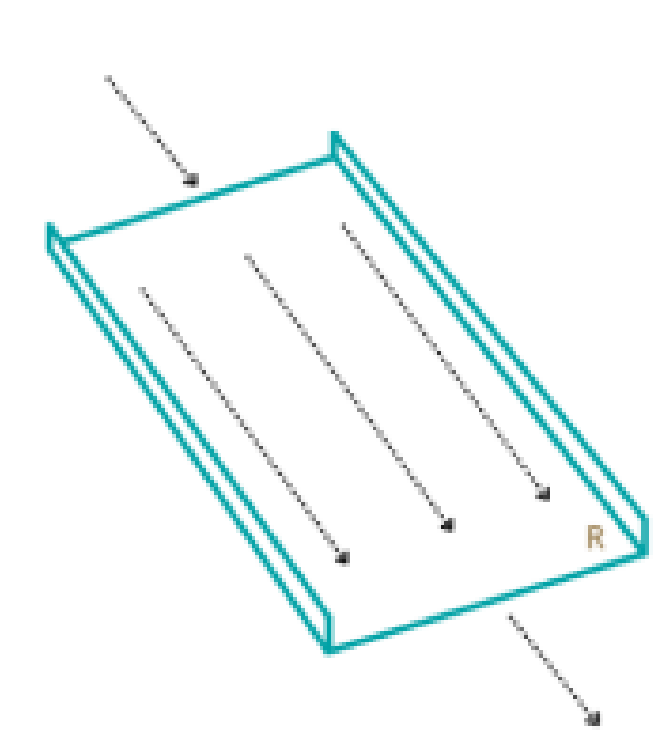
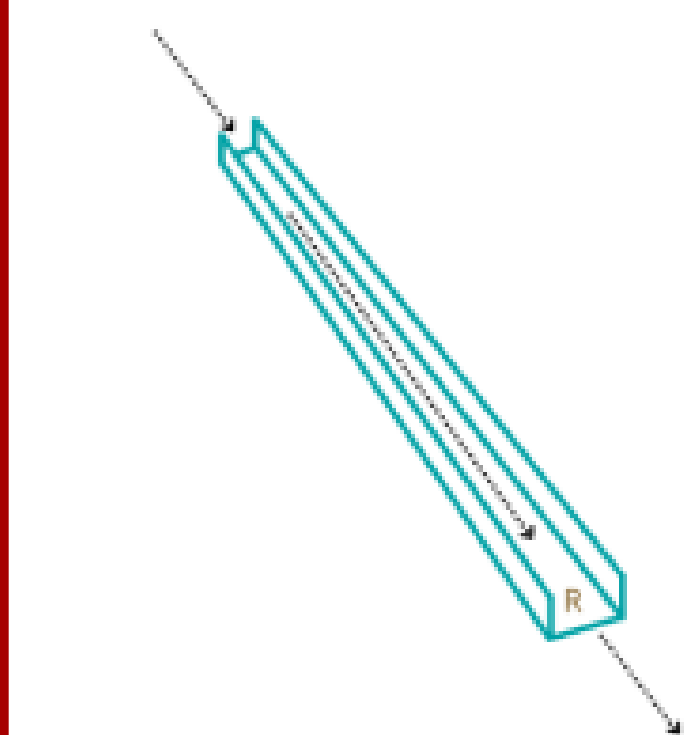
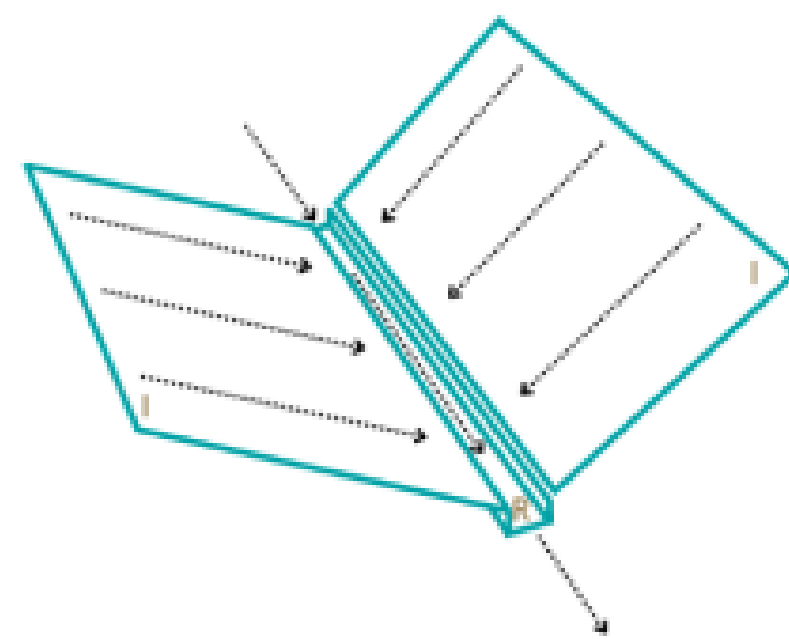
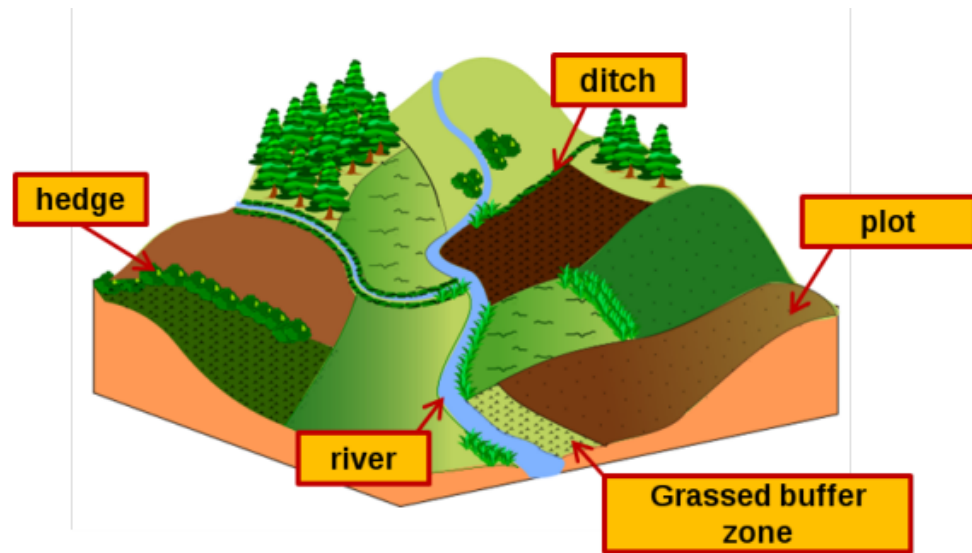
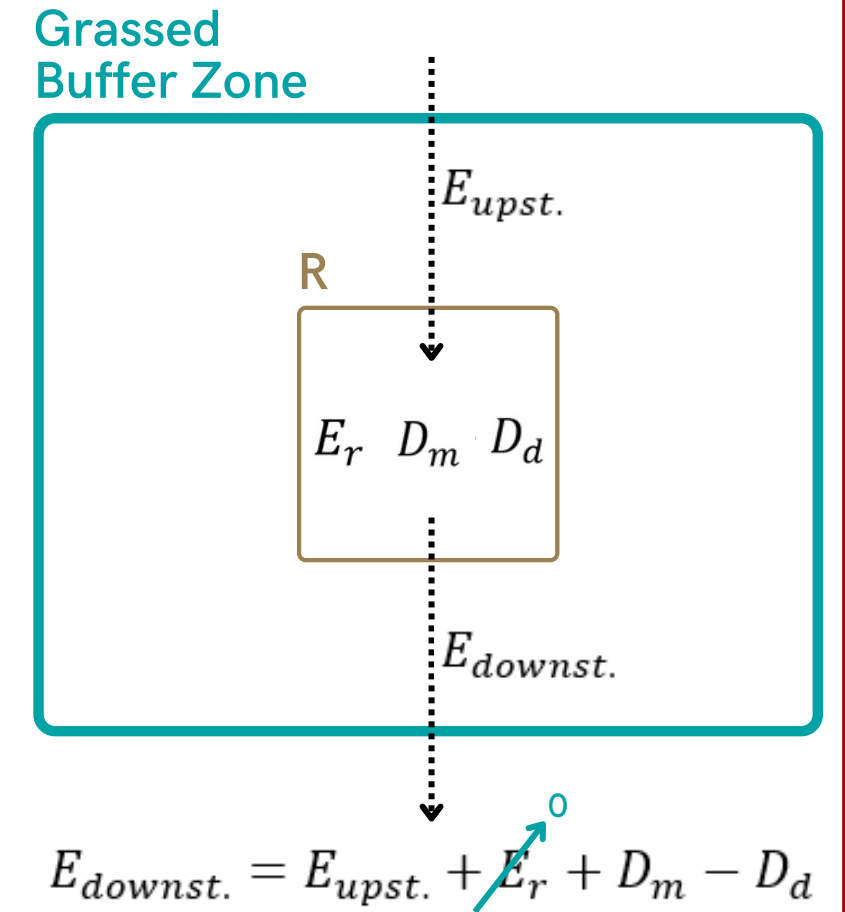
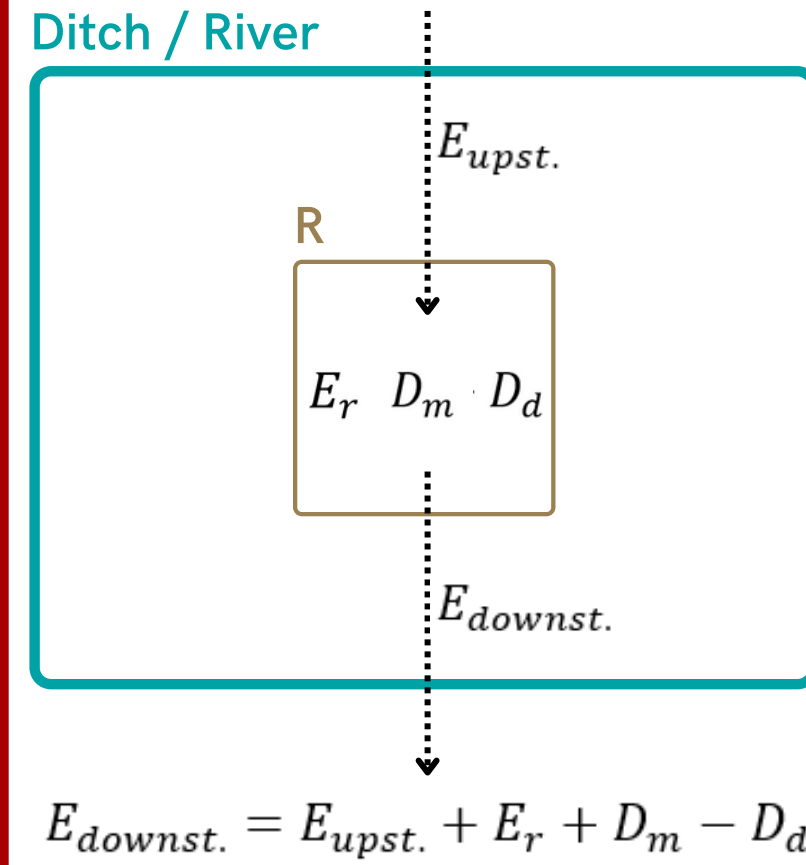
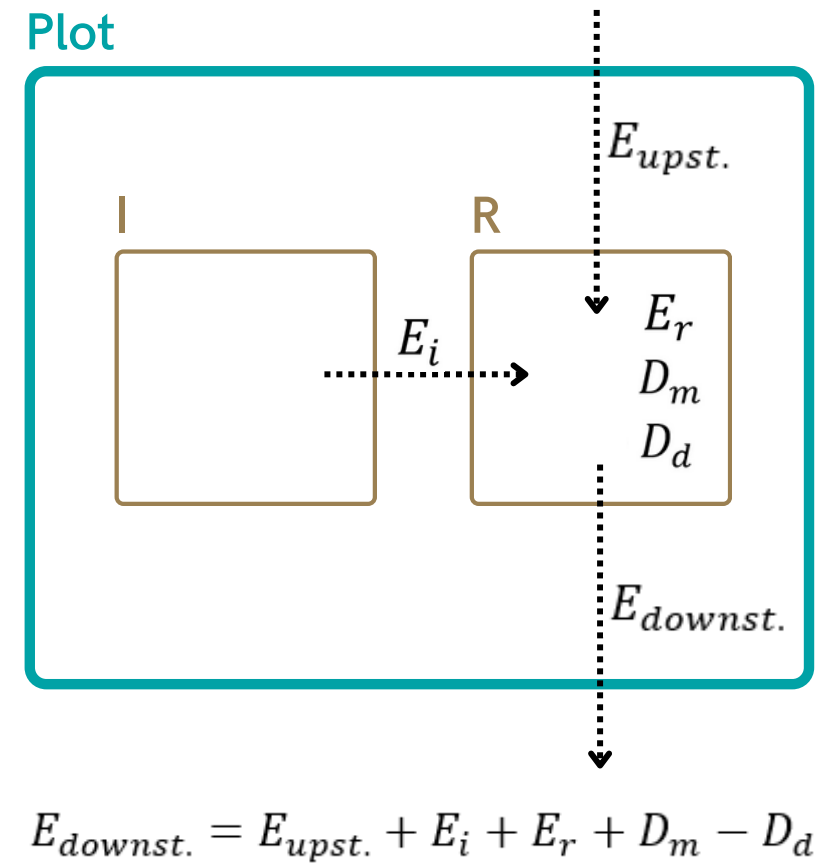


I = Interrill Process ; R = Rill Process

# PESHMELBA

## EROSION MODEL

### Processes representation for each landscape element: Rill Erosion and Deposition



I = Interrill Process ; R = Rill Process



**PESHMELBA**

**EROSION MODEL**

Testing phase

Innovative, continuous, and  
dynamic model

**Strong potential to represent erosive  
processes in a more realistic way !**



Questions?  
**Thank you very much!**