ILLIAD project: Sustainable, local or localised, innovative food chains – application to apricot production

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ILLIAD (a French national project, 2012-2015) proposes a method to analyze the system sustainability of food chains. The sustainability of food systems has been defined in terms of their effects on environment, economics and society, until now. ILLIAD aims to propose a method that allow to take into account the ability of these food systems to perdure or develop, in the long run, and aims to access their ability to increase their positive effects on environment, economics and society.

Methodology to analyze the systemic sustainability of the food chain

Four practical cases describing the three typical trajectories (Figure 1):

- the chain innovation / creation of a new chain (peach and apricot) (Figure 2)
- the chain differentiation / development of distinctive products (rice and spelt)
- the territorial embedding / strengthening interlinkages between economic activities (wheat and equestrian centers).

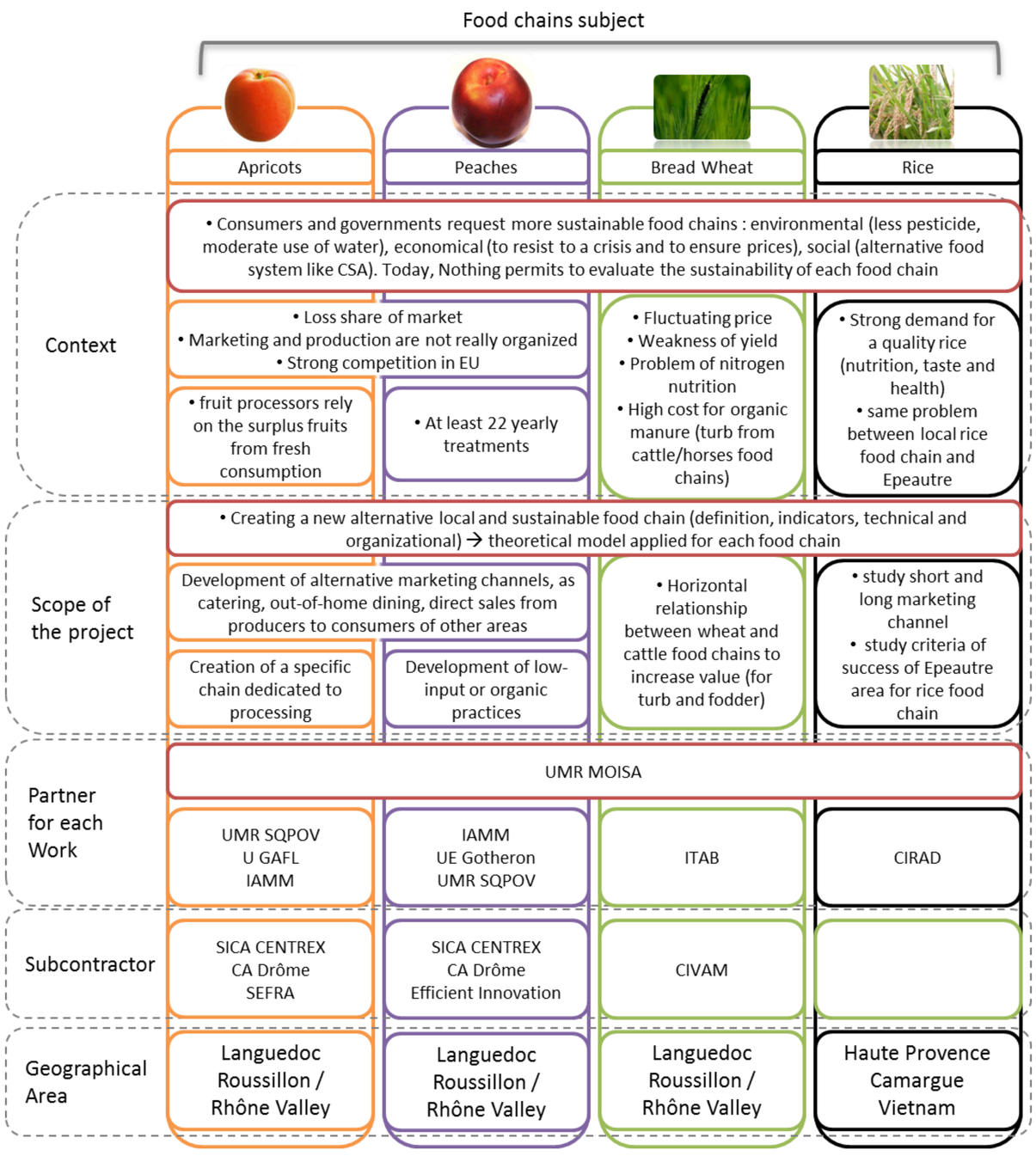


Figure 1: Food chains studied in the ILLIAD project

The expected results for apricot chain could be of great interest in defining both fresh and processed fruit ideotypes. One hindrance for development of orchards dedicated to processing is the high cost of manpower. So, our project includes the experimental analysis of mechanical harvest of orchards (see poster Gouble et al.).

Apricot chain: system sustainability

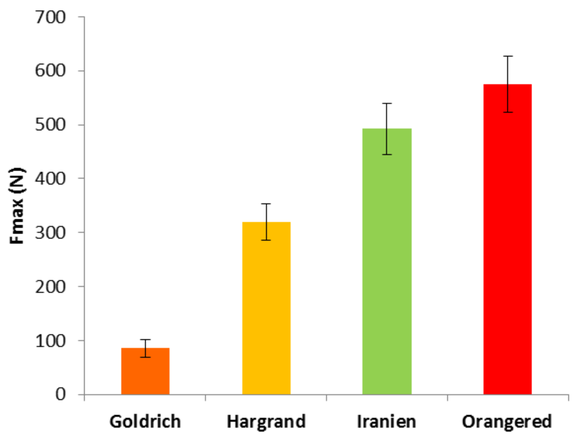
- Definition and building of indicators (bibliography)
- Understanding relationship between producer and consumer (experiments)
- Evaluation of barriers to sustainable food chain development

sub-task 1 : apricot sustainable food chain

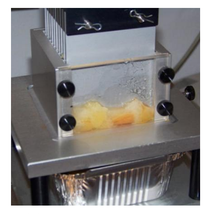
- Analysis of existing apricot food chains (// peach)
- Proposition of new alternative marketing channels (// peach)
- Design of the apricot processing chain

sub-task 2 : Identification of apricot lines suitable for processing

- Identification of the relevant quality traits in apricot (texture, composition).
- Relationship between texture of fresh and processed fruit (Figure 3) / identification of physical, chemical, physiological and genetic factors related to this trait.



For the same initial firmness, very different textures can be obtained after cooking in a syrup (Figure 3).



Kramer test

Figure 3: Firmness (Fmax in Newton) of processed halved apricots crushed with Kramer cell. Apricot halves were cooked in a syrup until 80°C in core. Means +/- SD of 3 measurements).

sub-task 3 : technical constraints of an orchard adapted to processing

- Selection of apricot varieties according to fruit texture (mechanical stress), tree architecture (upright tree), fruit maturity (homogeneity) and agronomic traits (productivity).
- Orchard management according to harvesting machine: distance between trees, trunk eight, width of aisles and irrigation system.

A new sustainable apricot food chain

- Tests in new orchards: harvest and quality evaluation
- Apricot processing at pilot scale
- Acceptability of apricot by consumers

Tests/validations

Figure 2: Focus on apricot chain

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