



SOCIO-ECONOMICAL IMPLICATION OF GRASSES (MISCANTHUS & ALFA) FOR A SUSTAINABLE PRODUCTION OF BIO-FUEL: “FEW CONFLICTS OF INTERESTS TO AVOID IN TWO MEDITERRANEAN COUNTRIES”

1. INTRODUCTION.

- . Engineering Department of HEXABIO led studies about the strategic coherence for the Bio-Energy developments in 2 Western Mediterranean countries: miscanthus and alfa grasses concerned.
- . Business plan aggregates the data of agriculture plantation, harvesting, converting into bio-fuel (pellets or briquettes) and commercialization in the supply chain (particulars: family kitchen, heat furnaces, or industry: power plants)
- . Objective was to unblock all the sociological conflicts while the biomass is a renewable resource which can deliver an important Calorific Energy as presented in the figure 1.

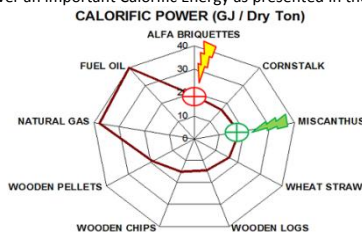


Figure 1: Position of Miscanthus & Alfa grasses versus other fuels: Inferior Calorific Power in Giga Joules by Dry Ton. Source: Hexabio R&D

2. CASE STUDY N°1: MISCANTHUS AS BIOFUEL.

2.1. Experimentation. Limited plantations of Miscanthus x Giganteus, a sterile hybrid genotype of the perennial grass, have been carried out in the Southern of France.



Figure 2: Miscanthus BetaTest based in MANO (40) – 2 years old. Photo: Hexabio

2.2. Production. The yield potential of this annually harvested bio energy crop has been demonstrated to be largely superior to 15 t/ha dry weight. For a distance of 50 km between the place of harvest and the boiler according to the supply (in balls or in briquettes), the miscanthus is situated in a very wide range of energy cost price (figure 3).

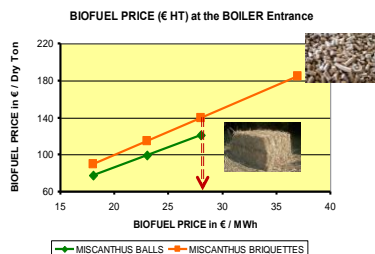


Figure 3: Economical balance of miscanthus delivered at the heat plant. Source: HEXABIO R&D.

2.3. Limited perspectives. The plantation of the miscanthus would bring of the energy biomass to complete the wooden industrial supplies energy, but the forest management systems is yet optimized as for energy wood residues which are currently largely available.

3. CASE STUDY N°2: ALFA AS BIOCOMBUSTIBLE.

The named (H) Alfa project [2] was designed and proposed in the Moroccan Country in order to produce 150 000 tons of compressed briquettes. This agro-industrial model was presented to the farmers which have today the only solution to conduct pastures and to build or to select a co-operative structure which will govern from the feedstock culture to the combustible.

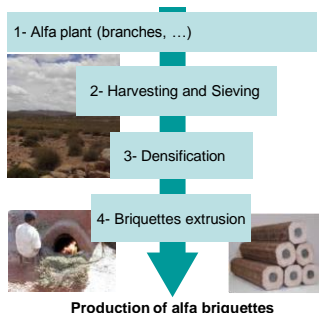


Figure 4: Structure of production of Alfa briquettes. Source: Hexabio

4. CONFLICT OF INTERESTS AND SOCIOLOGICAL IMPACTS.

4.1. Agro-forestry & crop combination options vs local competition and biodiversity.

The maintenance of the zones covering high-voltage electric lines (figure 5) could be dedicated to the realization of economical developments in favor of the environment policy and of the biodiversity. The plantation of miscanthus enters competition with the current systems of fallow financed completely by EDF (ENEDIS) or by some projects of development of these available surfaces introduced by associations of hunters: after a realized clearing, and vegetable plants implanted to bring zones of reproduction and food for the local wild animals.



Figure 5: Large areas with electric high-voltage equipments. Source: RTE/ EDF

4.2. Agro-energy: vision about the local interest.

The steppe ecosystems, in Oriental Morocco, are marked by important landscape diversity in relation with a great variability of ecological factors. Areas with pastoral tradition, their population are made up primarily of pastor-stockbreeders, formerly nomads for the majority, with an important sedentary tendency nowadays. The lack of consultation between different actors of development are as much factors that contributed to lands and natural resources degradation, and to the rupture of environmental equilibrium. The (H)ALFA project [2] has been proposed but how to solve the current dilemma occurred in this region as designed in the figure 6.

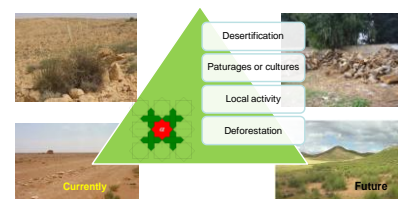


Figure 6: Country and sociology dilemma to produce alfa briquettes. Source: HEXABIO R&D.

5. KEY FINDINGS.

A. Southern of France: The efforts that private companies have devoted to sourcing biomass at their facilities warrant a closer look to evaluate their level of success. From diverse lobbying actions (providers of Electricity, public helps, ...), in order to produce heat, steam or electricity (co-generation) the regional paper industry has taken the choice to select forest wastes instead of natural grass developed in some cultural zones.

B. Oriental Morocco: In this field, personal relations, family links, tribal affiliations, groups and clients are still the most determinant levels of political positions. In this framework, the change can only be gradual to enable the political elites, which are slow to change, to digest the stages. That is the case within the rural Wilayas where any agro-resource change is occurring. Currently it is still faced with several limits and difficulties to be overcome in order to firmly establish its vision and action with a view to real sustainable development. It is necessary to build a sort of revolution in behaviors: (1) farmers planting and harvesting the alfa grass, going to the cooperative to compress it and selling the briquettes to them local use or to the industry // instead of moving back to the city and to quite this rural healthy life. (2) Commitment of the local notability to invest in these projects.

6. CONCLUSIONS.

Biomass energy from those **two natural grasses, miscanthus and alfa**, in the **Western Mediterranean regions** could be promoted by:

- Creating a technological breakthrough – bio-fuel built from grasses within the forestry or agricultural sectors around of the existing power utilities (boilers in the paper or cement industry).
- Looking for Local champions and long term commitment – which should demonstrate long term commitment and should have significant control over the design and implementation of initiative.
- Attracting some Income generation and revenue sharing.

7. REFERENCES.

- [1] About miscanthus as bio-fuel – ENERMAS International School – Montpellier –France (2014).
- [2] Scientific Book “Projet (H) ALFA” Edited by Editions Universitaires Européennes (2018).