# From the genes to the territories : Developing sustainable sorghum multi-purpose value chains

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* Invited Speaker to the Conférence Intensification Durable 2017 Biodiversité et ingénierie écologique pour une intensification durable de l'agriculture. April 24th-26th 2017, Dakar, Senegal

To face global warming and fossil fuel depletion crisis, plant biomass will provide a renewable source of energy, materials and chemicals. Accordingly, agriculture will have to adapt not only to avoid competition between food-feed and non-food non-feed uses but also to ensure the economical and environmental sustainability of these productions. In this context, we are developing an integrative strategy merging genetics, breeding, material sciences, energy production, animal nutrition and socio economic analyses to accelerate the development of

multipurpose sorghum value chains for both Mediterranean and tropical semi-arid conditions (West Africa).
As a first step, new products (biocomposites) and uses (biomethane production) are being developed. Then the plant traits impacting the production and quality of the different end-products and uses are being identified taking advantage of the genetic diversity of sorghum. As a third step, the set-up of these key traits in the plant is being analyzed in order to describe their patterns of development / accumulation, their susceptibility to environmental constraints and provide some insights regarding their molecular determinism. Taking advantage of these functional information, the genomic regions impacting the key traits are being deciphered and used to develop new breeding tools and breeding strategies. In parallel, to maximize the probability to convert scientific results in local impacts, the different stakeholders of the value chains are being mobilized and territorial analyses aiming to assess the relevance of the different value chains are performed.

**Keywords** : sorghum, multi-purpose, genetics, breeding, histology, biochemistry, ecophysiological modeling