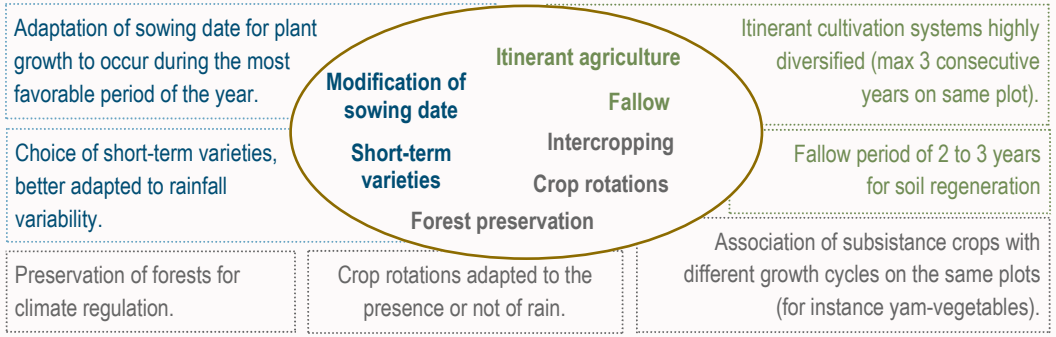
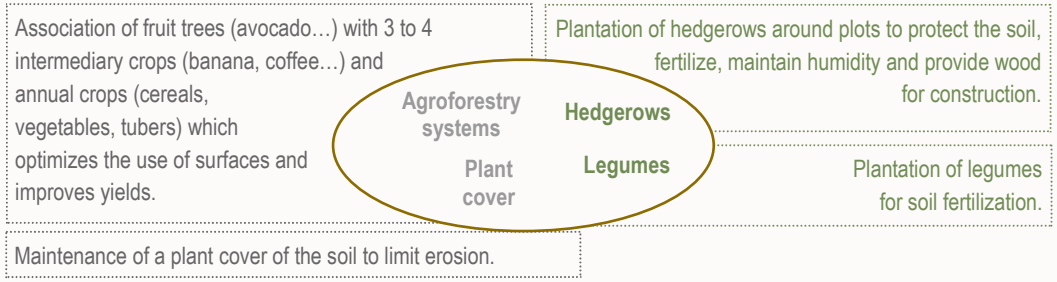
Example of combination of practices in the sub humid zone : in North Côte d'Ivoire

In sub humid zones, climate change accentuates the challenges posed by temporary droughts, reduction of pastureland surface and extreme climatic events. In Côte d'Ivoire, Sénoufos peasants have practiced agroecology for centuries. They implement techniques to adapt rain-fed production to rainfall patterns' variability and preserve soil fertility.



Example of combination of practices in the humid tropical zone : in West Cameron

In humid tropical zones, climate change makes more unpredictable the availability of water in time and space and accelerates soil degradation. Extreme events also threaten crop and animal productions. In West Cameron, peasants have developed highly diversified farming systems based on agroecological principles.



Innovative combinations of agroecological practices are implemented by peasants in various regions of Africa to strengthen farming systems regarding climate changes. These practices contribute to the improvement of living conditions and food security of rural populations, by securing their activities.

Brochure extracted from the study « Agroecological innovations in a context of climate change in Africa » led by CARI and AVSF (Valentine Debray) in the framework of the project PAMOC 2 of the Climate and Development Commission of Coordination Sud. The complete study will be available at www.coordinationsud.org from September 2015. The results presented in this document come from interviews and literature review and are therefore not exhaustive.

Agroecological innovations in a context of climate change in Africa

What climate change in Africa ?

Climate evolutions are already observed and expected in many regions of the world. These changes will have multiple consequences for human societies. African populations are amongst the most vulnerable, because they are highly dependent to primary activities such as agriculture, which success is closely linked to the climate. Climate change affects peasant farming systems and therefore threatens food security.

Global trends of climate change are observed in Africa, although variations must be studied locally.

Mean temperatures are increasing and should reach a 3°C raise by 2050.

Rainfall patterns are becoming more and more unpredictable, with a higher variability in time and space.

Extreme climatic events, of different nature depending on the regions (heat waves, droughts, heavy rains, floods...etc.), are becoming more frequent and more intense.

These climate changes have and will have direct and indirect effects on rain-fall agriculture generally practiced by African peasants.

Which consequences for agriculture ?

Warming accelerates soil degradation and thus contributes to the loss of arable land. Temperature raise also limits animal and crop productivity: it accentuates heat stress, stimulates evapotranspiration et favors the development of pests, parasites and diseases. Furthermore, higher temperatures alter the quality and density of vegetative covers. Yields of rain-fed crops could indeed decline because of warming.

Rainfall increasing variability further restricts access to water for peasants and shortens growth season of rain-fed crops. Furthermore, this instability alters the quality and quantity of available pastureland. More globally, in regions subject to aridity, soils degrade more rapidely. These factors limit animal and crop productivities.

Extreme climatic events could also have significant effects o, agricultural produciton. Crops and animals are sensitive to droughts and heat waves which increase heat and water stresses. They can also be affected by floods which favor diseases vectors. Finally, heavy rains indirectly impact agriculture by altering soil quality.

Which adaptive strategies of African peasants ?

African peasants will have to face the challenges of climate change which threaten their farming systems. In various African countries, peasants implement innovative combinations of agroecological practices which favor the functionning of each of the component of the agroecosystem and their interactions. The management of farming systems is thus improved, which secures their maintenance. Each combination is adapted to the environment it is implemented in and contributes to adapt farming systems to novel climatic contexts. Here are some examples...

Example of combination of practices in the arid zone : in Mauritanian oases

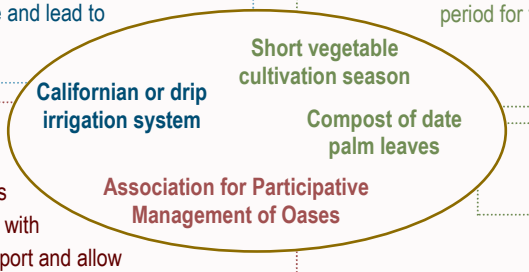
In arid zones, climate change accentuates the major challenges of water and soil fertility management. In Mauritania, peasants work at plot scale to improve their management of both resources. In parallel, they organize themselves in peasant groupments in order to work collectively on oasis preservation and improvement of their functioning.

Irrigation systems which are more efficient than those based on submersion, and supplied by solar pumps. They save water and time and lead to important yields.

Production of vegetables from October to December, followed by tillage before organic fertilization and rest period for the soil. This technique prevents accelerated soil degradation and maintains fertility.

Gathering of peasants of oases of the zone in a peasant organization. This groupment provides them with technical training and support and allow them exchanging knowledge (farm visits)

Use of compost of date palm leaves as fertilizer



Example of combination of practices in the sub-arid zone : in Burkina Faso

In sub-arid zones, issues of water and soil fertility management are accentuated by climate change. In Burkina Faso, some peasants combine techniques to efficiently collect and use available water and to improve soil quality and avoid its degradation.

Collection of rain water (roofs, catchment areas), run-off water (reservoirs, mini-dams) and groundwater (wells).

Alternance off season vegetable production (thanks to water reservoirs) / cereals in wet season.

Seed scoating (clay soil, compost, cereal bran) before sowing in zaï holes to maintain humidity and avoid consumption by animals.

Mecanization of holes digging and fertilization with compost instead of household waste.

Enrichment of compost: with trichoderma acting as fungicide or with natural phosphate.

Maintenance of organic matter and humidity in plots thanks to stone bunds, contour bunding...

Plantation of cereals in *Acacia* agroforestry parks (fertilizer tree specie)

Biogas fabrication from animal excrements and use of effluents for fertilization.