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Climate Information as A Support for Optimizing Agricultural Public Policies: A Comparative Analysis Among Peasant Communities in The Middle Couffo (Benin) And Kpékplémé In the Middle Mono in The South-East of Togo

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Abstract:

Responses to climate change often take the form of strengthening the resilience and adaptive capacities of communities vulnerable to hazards. To this end, climate information is very crucial and must constitute an essential element of local public agricultural policies. In this perspective, how do local communities participate in the popularization of climate information in order to establish sustainable strategies for climate resilience? This involves analyzing the role of local communities in agricultural extension through the dissemination of climate information. The methodological approach taken is based on the observation of the agrarian landscape and the modification of the finage, the techniques of resilience of the peasant communities and semi-structured interviews carried out with 221 targeted actors in three agricultural communes of Moyen-Couffo in Benin. and in Kpékplémé and Aklakou in southern Togo. The analytical approach oriented from the perspective of local agricultural public policies has made it possible to bring climate information closer to a competence of local communities. This article, based on a corpus of resilience itineraries, sheds light on the role of local authorities in anticipating and adapting to climate change. It appears from the cases studied that the promotion of sustainable adaptation strategies depends on a local public agricultural policy supported by planning and agricultural innovations based on climate information and their popularization by decentralized territorial entities.

Keywords: Resilience – Climate information – Public agricultural policies – Middle-Mono – Middle-Couffo.

Introduction:

Climate change today constitutes both an essential development concern and a multivariable equation for peasant communities who are constantly suffering the effects of this phenomenon. Agriculture is today subject to climatic conditions to which societies must, and will henceforth have to adapt to varying degrees, however, depending on the territories (spatial variability), and according to the overall level of mitigation achieved (temporal variability) (E. Richard, 2017, p. 3).

> The "climate crisis" poses with acuity the questions of equity over time (between generations) and in space (between territories), in particular because mitigation measures can only be effective in relation to the final objective pursued if all territories subscribe to this objective and simultaneously aim to achieve it in their actions (F. Bertrand, 2016, p. 4).

Indeed, most countries are highly exposed to bad weather and the impact of climate changes that make it difficult to control the environment and natural resources. The consequent distortions also lead to difficulties in food security planning. However, achieving the objectives of adaptation to climate change implies not only aiming at the protection, resilience and reduction of the vulnerability of communities; which presupposes a territorialization of actions and an objective capture of climate data which must be popularized and taken into account in the decisions guiding agricultural action. The breakdown of climate information proving to be basically the basis of the control of the agricultural calendar. In this perspective and with reference to the local dimension of agricultural policies, local authorities now constitute relay actors. According to R. Dantec (2021, p. 4),

> "the local authorities, by virtue of their role as initiators and coordinators of local projects and by their proximity to the inhabitants and the territorial actors, are the privileg§ed entities to implement the logic of partnership and systemic approach that the SDGs bear as part of their climate action..

Indeed, climate change is illustrative of a real entanglement of causes, consequences and especially links between all sectors (agriculture, energy, water, forests, etc.) and between all actors. It reveals its effects at all scales in a total interdependence, from local to global. The diversity of causes, mainly anthropogenic, and political, economic, social and environmental consequences justifies the transversal nature of the problem and the need for it to be treated as a local governance issue.

Considerable efforts have therefore been made from this point of view in terms of international instruments to promote a holistic and local approach more adapted to the issue. Nevertheless, it still remains plagued by the inadequaciesrelated to the control of hazards and a failure to grasp the traditional precepts that once structured finage. At the meso level, while the objectives of mitigation and adaptation are imbued with an intrinsic transversality, public action in climate matters is still characterized by the fragmentation of policies and the partitioning of Community initiatives. Also, in most countries, most of the sectors concerned by climate change have been the subject of skills transfer for the benefit of local managers, but whose inadequacies in terms of design and institutional and legal constraints hinder their action while the stakes are considerable for their territory.

In the agricultural areas of the Moyen-Couffo and Moyen-Mono, agriculture is subject to climate change, the effects of which are manifested by a disruption of the agricultural calendar, decreases in agricultural yields and market disruptions. These indicators have a significant impact on rural life and peasant lifestyles while modifying the primary objectives of agricultural public policies. Considering the global framework of interventions in agricultural matters, it follows that the climate constitutes the variable regulating yields

because it influences and redefines the trends of results. The recommended solution was to formalize an agricultural extension protocol involving local authorities through a formalization of territorialized agricultural strategies and take into account geolocalized specificities. However, the inaccessibility to climate information and not the control of hazards prevent peasant communities from fully understanding the variability and the current and future evolution of the climate. It is therefore imperative to ask how the consideration of climate information in the formatting of public agricultural policies makes it possible to establish strategiesand take into account geolocalized specificities. However, the inaccessibility to climate information and not the control of hazards prevent peasant communities from fully understanding the variability and the current and future evolution of the climate. It is therefore imperative to ask ourselves how the consideration of climate information in the formatting of agricultural public policies makes it possible to establish sustainable strategies for the resilience of agricultural communities? Based on a comparative analysis of the two agroecological zones, namely the Moyen-Couffo in Benin and Kpékplémé in the Moyen-Mono in the South-east of Togo, it is a question of justifying the contemporary opportunity for implementation in the rationalization and optimization of public agricultural policies; local authorities playing a role of key actors.

Methods, Materials and analysis model:

Methods and materials:

The present work is part of an exploratory and comparative methodological approach. The methodology used proceeds from a combined use of documentation and empirical research work. The empirical data collection work took place in periodic phases and is based on the observation of the agrarian landscape and the modification of the finage, the techniques of resilience of peasant communities and semi-directive interviews carried out with 221 targeted actors in three agricultural communes of the Middle Couffo in Benin and Kpékplémé in southern Togo. In addition, the maintenance guides were pre-tested during this exploratory phase in order to adapt them to the realities on the ground. Similarly, occasional interviews have been conducted to solicit clarifying answers as soon as new information appears that elicits reflections (Diarrassouba et al., 2008). The analytical approach oriented from the angle of local agricultural public policies combined with the conceptual assumptions of the sociology of mutations has made it possible to bring climate information closer to a competence of local authorities.

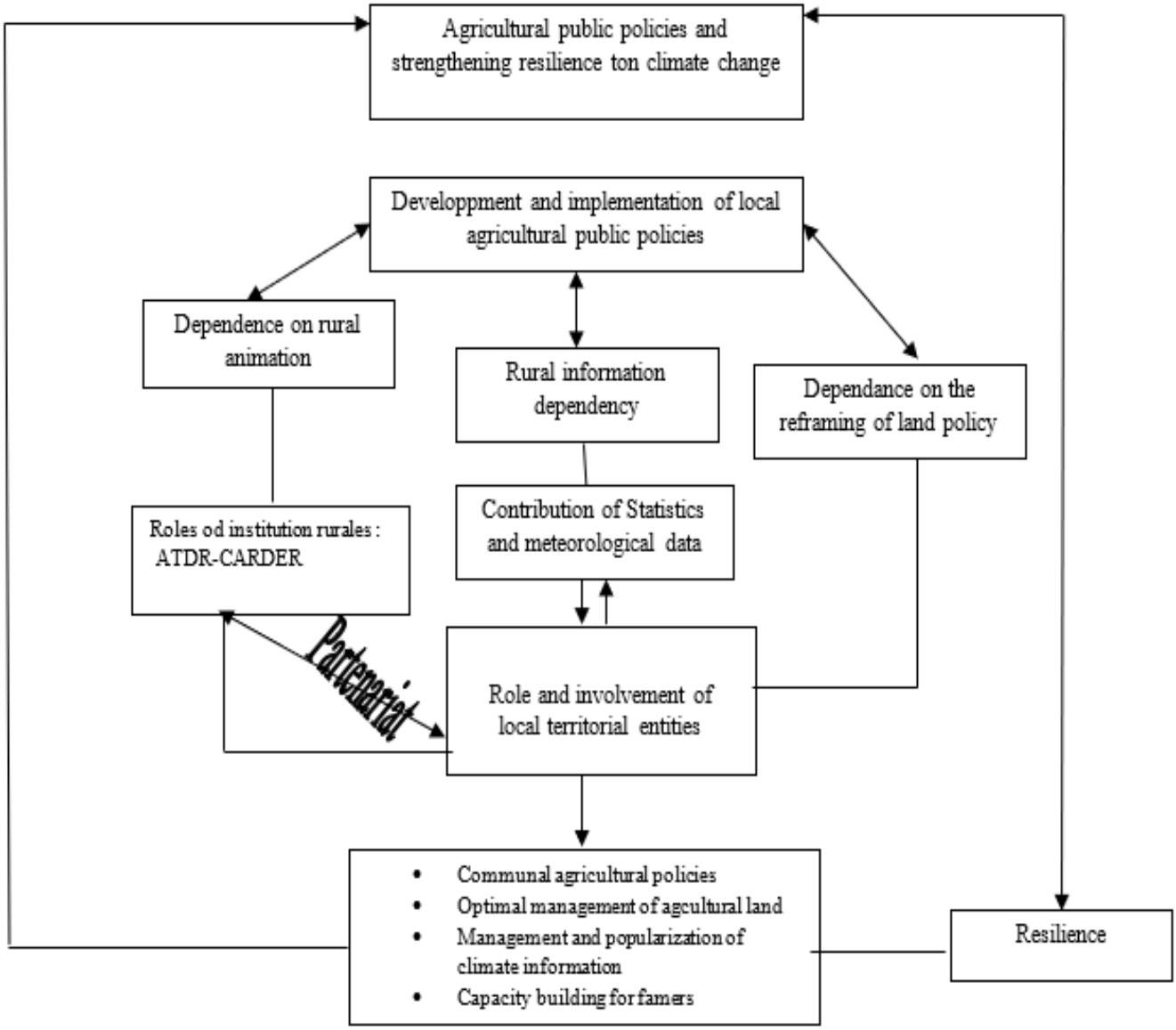
The table below gives an overview of the statistical distribution of the sampling.

Localities	**municipalities**	**Actors**				
		Peasants	Women'sgroups	Agricultural extension agents	Market players	Total
Moyen Couffo	Klouékanmé	27	31	5	12	
	Toviklin	11	19	3	8	
	Lalo	18	22	4	9	
Kpékplémé	Kpékplémé	22	15	2	13	
Total		78	87	14	42	**221**

A total of 221 actors were surveyed in order to understand the link between the information vehicle on climate issues and the performance of agricultural development strategies.

Conceptual and analytical model:

To analyze the data collected on the ground, the analytical approach oriented from the angle of local agricultural public policies has made it possible to bring climate information closer to a competence of local authorities.



Source : ourselves, january 2024

2. Results

2.1. Comparative agro-sociological specificities middle Couffo (Benin) and Kpékplémé (in the Middle Mono in the South-east of Togo)

The research takes into account three municipalities of the Middle Couffo, namely: Lalo, Klouékanmey and Toviklin and on Kpékplémé in the Middle East in the South of Togo. The Middle-Couffo is located in the south-West of Benin and covers an area of 946 km2. It is an area of great agricultural production and enjoys a very good rare and exceptional geographical location favorable to all kinds of crops: perennial crops and vegetable crops. The maps (geographical and administrative) below provide more information on the investigation sites

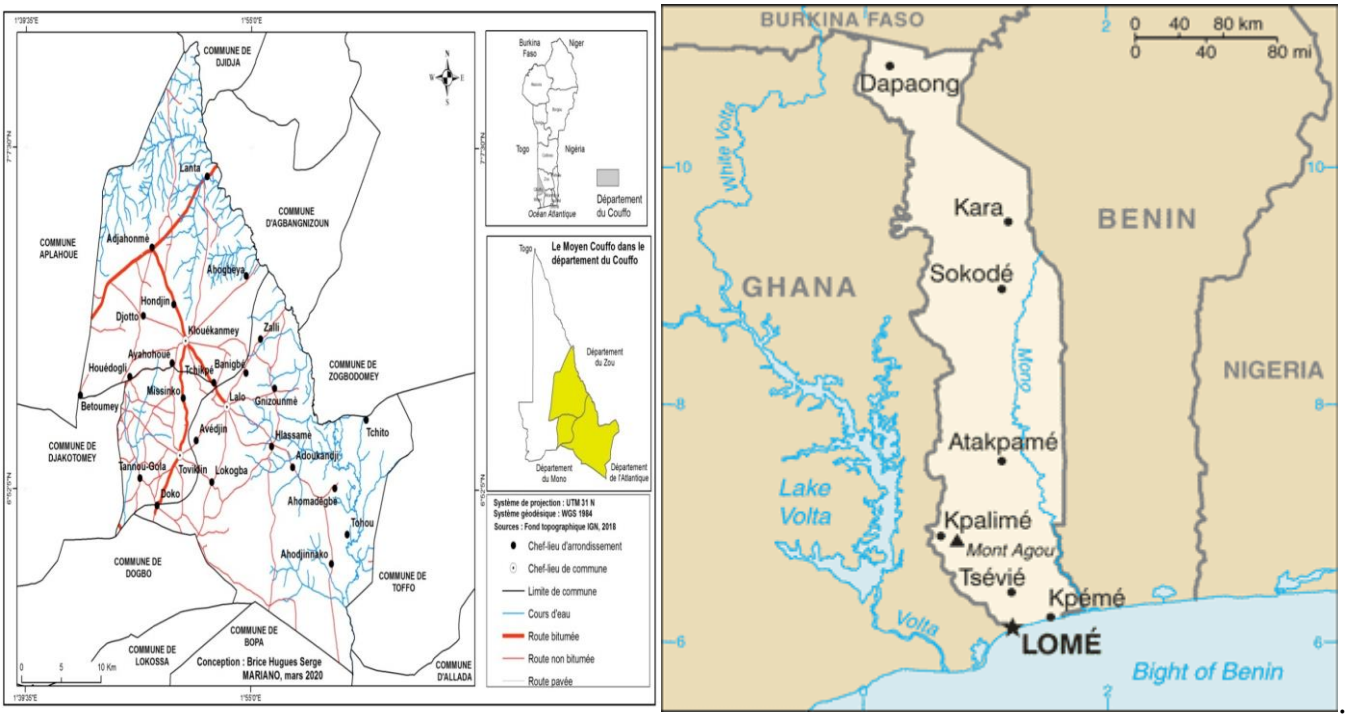


Figure: Geographical map of the two study areas

Although these two areas are one in Benin (moyen-couffo) and the other in Togo (moyen-mono), they benefit from relatively the same climate and the same agroecological characteristics.

2.2. Climatic dependence of agriculture in the Middle East and Kpékplémè in the Middle East: correlation elements

Peasant agricultural life and elements of climate dependence

The agrarian life among the peasant communities of the middle Couffo is essentially based on agricultural production. The latter defines a set k of five elements that animate the market: agricultural yields, agricultural rents, factors of production (producers' own capital), prices of agricultural commodities on local markets and local agricultural public policy (institutions, operating mechanisms).

k1 = agricultural yields ;

k2 = agricultural rents ;

k3 = factors of production ;

k4 = prices of agricultural products on local markets ;

k5 = local agricultural public policy.

The components of the variable k thus identified, it follows that the spectra of climatic mutations and the elements of resilience of agriculture in the middle Couffo and Kpékplémé are to be searched around the variable. These components make it possible at best to assess the adverse effects of climatic risks on agrarian systems. In the nomenclature of risks, the abundant existing literature and the observations and field surveys indicate: prolonged droughts = c1, the random nature of the rains = c2 and the invasion of the fields (flood and locusts) = c3 as justified causes. They are confirmed by 100% of the actors approached.

The assessment of the impacts of c on k makes it possible to carry out a real reading of the effects of climatic mutations both on the agrarian system and on rural community life in the middle Couffo and in Kpékplémé. Assuming I the impact of c on k, which ratio makes it possible to assess the climate dependence, it emerges that I takes the variables: decrease in agricultural yields, decrease in agricultural incomes, decrease in the

purchasing power of agricultural producers, indebtedness of agricultural producers, deterioration of the living conditions of agricultural households, rural exodus, amplification of rural poverty, economic precariousness of agricultural producers, soaring prices of agricultural commodities, scarcity of basic commodities, difficult access to basic social services, increased solicitation of humanitarian actors, increased solicitation of agricultural institutions, disruption of the functioning of local agricultural institutions, disruptions in the implementation of agricultural development strategies at the local level, reversal of rural-urban relations, the appearance of new social conflicts, the crumbling of family places, ...}.

Plate n° 1: Spatial overview of one of a rural hamlet in Kpékplémé
Shooting: Marius K. VODOUNNON TOPIN & Appolinaire D. GNANVI, 2024

These empirical surveys, even if they make it possible to account for the changes taking place in the rural world, nevertheless constitute real indicators for assessing the climatic dependence of agricultural activities. For S. F. (57 years old) agricultural producer residing in Klouékanmé :

> "the new climate has changed everything. Nothing is practically the same as before. We grow a lot to harvest a little. The rain no longer comes frequently; or if it has to come, we don't know the end. We don't have much control over anything anymore. The village empties and sometimes it is from outside that we bring the food. We no longer had enough money to pay for urgent things...".

This short statement by the peasant exposes the point of view of all peasant communities and reveals beyond, both the economic and social dimensions of the crisis and its effects on the accentuation of poverty in rural areas. Indeed, the social and economic scope of climate change, the induced collateral effects, the not irreversible consequences and the resulting societal and structural transformations base peasant community perceptions and legitimize their vulnerability. Both their agricultural practices and their social system depend heavily on the climate.

Dependence versus vulnerability

Conceptually, vulnerability summons, as shown by H. Thomas (2010: 43), two notions: the crack on the one hand (the sensitive, fragile area, through which the attack will arrive) and the wound on the other hand (which materializes the attack). It expresses the level at which a natural or human system can be affected and then degraded or damaged by the impacts of climate variability and change, including extreme events. It depends on both physical and socio-economic factors. In the current context, vulnerability refers to the influence or direct or indirect effects of a modified climate on agricultural systems and practices, finage, yields as well as on the magnitude of their self-adjustment. In the Middle Couffo, the impacts of the direct or indirect effects of the modified climate are expressive through the climate dependence indices. They are revealed through the prism of a correlative analysis highlighting climate change and agricultural yields.

In this perspective, a corpus of vulnerability indicators has been established. The elements of vulnerabilities indexed by the peasants result from the meshing of the specificities of the agricultural sector and the landscape, economic and social characteristics of the Middle Couffo. Therefore, it emerges from the factors that the decline in the fertilization momentum of agricultural land and land insecurity are the main factors of vulnerability of the agricultural system to climate risks.

Indeed, the first includes the hazards of rainfall, the degradation of cultivable land, the low resistance of agricultural varieties to drought, etc., while the land issue is related, among other things, to the low security of land and the new problems related to speculation and selling. To this are added the deficit in the adoption of agricultural innovations, the low appropriation of state interventions in rural areas, the dualism between

> "times have changed. Rural life is totally transformed. The drought is prolonged every year making our lands not very productive. Poverty and the needs of the hour lead us to sell our fields at a low price. And all this, because the state or the city council is not helping us. We are under-informed; we don't understand how things are going and what needs to be done..."

The analysis of these statements highlights the submission of farmers to climate change and their poor ability to contain potential risks and respond. In environments with low post-disaster recovery capacities, the permanence of risks persist and generate speculative dynamics that try to exacerbate poverty in the medium and long term. In development, an information system for monitoring and climate intelligence, one of the major challenges of a local nature related to agricultural control would be addressed in order to increase the response.

Plate n° 2: Landscape overview in times of drought in Kpékplémé
Shooting: Marius K. VODOUNNON TOTIN & Apolinaire D. GNANVI, 2024

Moreover, by visualizing the indicators of structural vulnerability which take into account the manifest forms of rainfall, the deficient aspects in agricultural public policies, the poor access to seasonal agro-meteorological forecast information, the level of education of producers, the failures in the functioning of Community institutional frameworks for the prevention and management of climate and disaster risks, the inadequacies in integrating the risks of droughts and floods into the development strategies of the agricultural sector at local level, it follows that agricultural information and its popularization would be a potential lever for the response to ongoing climate change in rural areas.

2- Climate information: an essential element of local agricultural public policies

Agricultural policy as a set of economic policy measures specific to the agricultural sector generally consists either in supporting agricultural production, or in stimulating production, or in stabilizing the market, or even in combining the three. Its purpose is to increase agricultural production in a sustained, progressive and sustainable way. The strategies to achieve this objective are based on: the control and rational management of climate information. Indeed, agricultural policy can be defined as public intervention in the agricultural sector. It is a set of public intervention measures that focus on national agricultural production or on imports and exports of products agricultural. According to (Ribier 2008), it is generally characterized by "a set of regulatory measures, structural devices, interdependent financial and human resources, implemented by public authorities to contribute to the progress of the agricultural sector".

For Benkahla (2010), agricultural policies concern actions carried out directly by the State at the level of its centralized structures, or at the level of decentralized levels, but also actions aimed at orienting the behavior of private actors. This definition of an "ideal" agricultural policy is based on a number of conditions that are rarely met in the African context. It assumes: (i) that there is a global coherence throughout the agricultural policy process, from the choice of strategy, the formulation of specific objectives, the identification of instruments and measures, their implementation and evaluation, and that there is consistency with other sectoral policies pursued (commercial, environmental, etc.); (ii) that there are long-term means to implement these measures, without interruption in financing, so that the policy is applied in a stable manner.

Everywhere, the first generations of agricultural public policies in the face of climate change are primarily organized according to a sectoral and quantitative approach. Local authorities are recognized only rather late in national strategies as a lever for climate information and also a major relay to multiply actions. This top-down institutionalization has effects on local forms of action in the face of climate change, in particular in terms of agricultural profitability and environmental protection objectives.

The effects of human activities on the climate system are emblematic of the environmental crisis (Vodounnon Totin M. & Montcho R. 2020) and remain unpredictable or even irreversible in places (Bourg, 2002, p. 184). Faced with this, local public action is essential and must be based on the question of public decision-making in a context of uncertainty. Agricultural policies have therefore begun to integrate the objective of adaptation, especially for family farming. Whether at national or international level, faced with the observed and projected effects of climate change, the issue of adaptation, and in particular that of agricultural adaptation, has increased in power over the last decade, as evidenced by its place in the Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC). At the local level, this implies a change of frame of reference and an inscription of choices in a planetary perspective (F. Bertrand, L. Rocher, 2011, p.1). For several years, some initiatives have appeared at the local level. They aim to demonstrate the capacity of local and regional authorities to act on climate change.

The ability of local populations to implement adaptation strategies and options depends on a set of conditions. The identification of these conditions is necessary in order to better identify the public policies likely to

influence them and therefore facilitate adaptation to climate change. Indeed, apart from the initial climate situation and the magnitude of climate change, most conditions can be influenced by public policies: general "good health" of family farming, economic and social conditions of theagricultural production, access to information, knowledge and know-how, organizational skills.

Also, all the conditions favorable to the economic development of agriculture also contribute to improving its ability to adapt to climate change: conditions of access to land and natural resources, to other productive resources (equipment, inputs, financing), conditions of access to markets, conditions of access to information and knowledge, existence of collective solidarity mechanisms or individual insurance.

The availability of climate data with the necessary geographical details is currently a major source of public policy formulation, especially in the agricultural field. Climate information is climate-related data on variables such as temperature, precipitation, wind, soil moisture, ocean conditions and extreme weather indicators. This climate information remains essential to support agricultural policies. Thanks to climate information, farmers preserve the achievements as well as economic progress in agricultural development. Communities and local institutions are able to provide the necessary resources, in particular climate information that allows them to be resilient to climate hazards.

They are essential to enable farmers to make informed decisions and to put into practice the information received. The information needs of the communities concern the following areas: low-cost water and soil conservation techniques (rainwater harvesting; barrier through the slope to reduce the speed of runoff and soil losses), locally relevant climate data, drought and flood adaptation measures, information on livestock and crop markets, termite control measures and awareness raising on climate change adaptation measures; sustainable management of agricultural land.

In the short term (agricultural cycle) and very short term (coming days and weeks), information on climatic risks or those arising from climatic conditions can help producers to modify the management of the production system (sowing dates, plant species and varieties used, constitution of fodder reserves, etc.) and to protect agricultural holdings

> "Climatic disturbances are here and we need to have as much information as possible on agricultural calendars, cropping systems, seed availability, conservation systems, etc. This not only allows us to have an idea of the likely start and end date of the rains, but also of precautions to be taken in order to resist the harmful effects of climate change".

Extract from the words of BT, producer, interview conducted in the municipality of Klouékanmè, on 02/02/2024.

However, the integration of climate objectives into local agricultural policies does not exclude the development, upstream, of a strategy and local climate action plans, even if they are integrated into the municipal development plans. Indeed, these allow us to give ourselves the means to define a true localized vision related to climate change, a local roadmap to achieve it and the respective role of each sectoral division of the municipality. They thus contribute to stimulating and monitoring the integration of objectives into sectoral and transversal policies and to promoting complementarity and coherence between the various actions implemented within the framework of these local public agricultural policies. Community-based adaptation therefore aims to support local populations to understand the changes they face and to take appropriate

measures based on this understanding. It is therefore essential to make climate information available to these peasant communities to enable them to manage the lives of their livestock, and therefore to minimize risks through the adoption of appropriate adaptation strategies. To do this, it would be necessary to use relevant information and accessible and understandable language, and also to de-dramatize the problems through simple, reliable and actionable examples in such a way as to facilitate the understanding of farmers to enable them to make the right decisions at the appropriate time.

Traditionally, farmers rely on indigenous knowledge that is transmitted from generation to generation in their decision-making in terms of cultivation and agricultural practices. Thus, the availability of climate data that will strengthen the integration of Indigenous knowledge in crop planning can contribute to a more judicious targeting of measures to be taken and also harmful or inappropriate actions to avoid.

The strengthening of local meteorological surveys and forecasts, the dissemination of available climate information (radio, community mobile phones) and the implementation / revitalization of early warning systems are useful measures to enable producers, local populations and public authorities to anticipate possible climatic accidents and their consequences (droughts, floods, violent rains, parasitic attacks). It is important that the information disseminated is easily interpretable by all producers, including family farmers; which is often not the case today. This information must then be able to be interpreted and used by political decision-makers, as well as by local populations within the framework of participatory processes.

The recent changes in the climate felt by the producers are the delay of the first rains, the irregularity of the rains and the shortening of the rainy season. This constitutes a major risk for the growth of crops especially at the stage of young plants as shown in plate 3 below.

Plate 3: Vegetable crops under water stress due to delayed rains

Shooting: Marius K. VODOUNNON TOTIN & Appolinaire D. GNANVI,2024

Moreover, knowledge of forecasts relating to the future evolution of field parameters is necessary to allow producers to anticipate future risks. The improvement of this locally relevant information on agrarian life, in particular thanks to the dissemination of notices to farmers, advice on crop protection and information on inexpensive techniques for water and soil conservation, has allowed a significant reduction in factors limiting productivity, losses and damage caused to crops. This makes it possible to improve agricultural productivity and community food security despite climate change for the success of agricultural policies as highlighted by this respondent. The advice provided by the agricultural advisers has particularly helped me. The harvests of previous years were catastrophic for me. I didn't know anything about protecting crops from rodents other

than the traditional methods that our parents used. But since I started by participating in farmer meetings and trainings, there has been improvement. I gained knowledge not only about production systems but also about conservation.

The following plate 4 illustrates this reality well

Plate: yield of a tomato crop in compliance with climate information
Shooting: Marius K. VODOUNNON TOTIN & Apolinaire D. GNANVI, 2024

Local authorities: key players in agricultural extension

The demographic explosion, which leads to increasingly important food needs, and climate change which is disrupting production systems, have made the challenge of sustainable food security even more difficult to meet. With a world population that today exceeds 7 billion inhabitants and which risks crossing the threshold of 9 billion in 2050, agriculture cannot sustain a continuous increase in global food demand any longer, unless a readjustment of production systems is carried out on a regular basis with the development and availability to farmers of means, knowledge and new organizational systems that can allow them to reach increasingly important levels of productivity and production.

To meet population growth, global food production will have to increase by at least 70% over the next four decades. However, other challenges remain to be met: climate change, which threatens to reduce crop yields, high post-harvest losses, environmental degradation and rampant unemployment in rural areas. Humanitarian disasters attract the attention of the whole world, but the ongoing challenges that farmers and consumers face are equally important for the future well-being of all. To cite just one example, food prices are experiencing dramatic increases.

As pointed out (F. Bertrand, L. Rocher, 2011, p.6), the action of local authorities in climate matters takes shape in a voluntary framework where they place themselves as a relay of the institutional message, it is stimulated within exchange networks and by a concern for positioning and visibility in a context where the environmental theme is a central element of "territorial marketing". It also takes the form of incentive and contractual measures for residents and economic actors. This relay role takes several forms such as communication campaigns or even incentive measures intended to massively change behaviors. This action by local authorities on agriculture is done according to X. Guiomar 2011, in at least four ways :

- by their global vision of the territory and their ambitions for it, which translate into devices oriented towards this evolution by integrating agriculture more or less clearly into projects and programs.

- by their regulations (standards, authorizations, etc.), it is the famous "stroke of the pencil" that can tip the destiny of a plot or an entire plateau to the agricultural or urban side or promote diversity there. These choices are more or less well known and understood by local and agricultural populations depending on the community's investment in communication.
- by their (co-)financing of projects or structures more or less directly related to agriculture.
- and by their consultation processes which more or less involve the population and the different families of public and private actors at the different stages of policy development.

The global action of a local authority on agriculture can favor one of these paths of action without necessarily declining it in the others. The popularization and theagricultural companies play an important role in sharing research results and technological innovations with family farmers. They provide them with the necessary support to improve their productivity and increase their income. Therefore, the development of agriculture, in order to be efficient and sustainable, must go hand in hand with the establishment of agricultural extension and advisory systems adapted to the needs of producers.

Discussions:

Despite the awareness and commitment of stakeholders, climate change continues to generate new global, multidimensional, interdependent and multi-level challenges, particularly at the economic, social, spatial, environmental and even security levels, likely to annihilate the potential of sustainable development. The climate becoming by essence the domain which specifies the limits of the adage which, analyzing very pertinently the interdependence between the problems and the territorial scales, proposes to "think globally and act locally". The strategic reflection on the climate must situate the place and the role of the local territory as a pivotal actor, and the place of collective awareness, mobilization and creative action. It is therefore a question of taking into account particularities and contexts in order to make public policies climate-compatible.To dedicate the territory as the seat of mutations and innovations means to develop a systemic and inclusive approach starting from the realities of natural environments and human systems, under the leadership of local authorities in partnership with all the families of actors, in the intersection of challenges and scales. The involvement and full accountability of local authorities in curbing the effects of climate change make it possible to identify the aspirations and projects of communities, then to adopt and implement appropriate measures with all the required precision. Achieving this challenge requires bolder decentralization policies focused on climate information, more endogenous and prospective local development processes and a subsidiarity more oriented towards collective action.

As mentioned by the NGO CARE, 2015,

> "climate information is an essential element of adaptation processes, including longer-term climate forecasts and shorter-term information such as seasonal forecasts, early warnings for extreme weather conditions, short-term weather forecasts and local rainfall data. In some contexts, access to this information is difficult, due to the lack of availability, weak communication systems or political barriers to access for local [actors]".

Just like the implementation of sustainable development, the question of adaptation is gradually emerging on the local scene and constitutes a necessary step for the seizure by public action. In this context, the magnitude

of the changes indicates the need to forge emergency measures concerning ecological planning, the pooling of data, the improvement of observation systems, the exchange of information on best practices, thestrengthening technical cooperation and the establishment of close collaboration with decision-makers (WMO, 2007, p. 5). The territorial anchoring, its transversal and complex nature, as well as the associated uncertainties constitute at least three dimensions of the adaptation problem that make it difficult for the territories to manage the effects of climate change (E. Richard; 2013, p. 6). They require linking the strengthening of the capacities of the actors to the development and support of climate research to protect themselves, in particular from simple conveniences and their harmful impacts in the long term.

The results of this investigation on the two compared sites corroborate previous work and thus testify to the extent of climate change on agricultural systems and the ultimate urgency of rethinking public policies and agricultural development strategies that must integrate climate information into their master plan. By referring to an anthropological modeling of the effects of the climate, which expose the human-cultures-climate relations, it follows that the manifestations of the climate have a human historicity.

The recognition of local corpora of adaptation to climatic variability would serve as a support for the theoretical construction of meaning, in terms of climate information to be taken into account in the formatting of policies at the service of the rural world. This refers to the (anthropological) reading indicators of the climate. It is indeed a question of documenting these indicators in order to establish a base of structural and cultural elements for reading signs and indicators that can inform about the fixed facts of the climate.

Climate information then refers to all the knowledge, knowledge and know-how that justifies the climate manifesto according to the agricultural areas. It is fundamental to optimizing strategies for building resilience and reducing community vulnerabilities. For this purpose, it is therefore important to insist on empirical data to correlate the specificity of the terroirs with the indicators of climatic mutations. The degree of climatic stress depends on the human facts about the climate in the agroecological area concerned.

It is necessary to fully understand this complex phenomenon, to make climate information available and to facilitate the exchange of knowledge and technology. Communication, for the proper sharing of information, has a decisive role to play. The disruption of the climate system linked to human activities is the subject of a recent institutionalization and tends to impose itself as a central element of local policies. The action of local authorities in the face of climate change, qualified as emerging local climate policies, is taking shape in a rather changing institutional context. This point of view is supported by S. Bertrand, L. Rocher, (2011), for whom the integration of climate issues into local public action is based on voluntary involvement at the initiative of local authorities, beyond any regulatory obligation. The interventions of local authorities in this area must now have an incentive character, proposing a framework for action, the elaboration process and the content of which are to be defined by local actors. The central level, producer of a discourse on the need for a collective effort to be relayed and multiplied by territorial entities and individuals, must make available to local authorities, methodological tools and institutional frameworks that tend to be generalized.

Two approaches are generally advanced to promote adaptation to climate change: on the one hand, the "top-down" approach, based on institutional responses, procedural agreements, funding allocations; and on the other hand, the "bottom-up" approach to risk reduction, based on improving the capacities of local authorities to adapt and prepare for disaster (Yohe et al, 2007, p.820). The systemic and transversal nature of adaptation to climate change tends to combine these two approaches, approaching the content of risk management based on the assessment of both hazards and vulnerabilities of the territory (E. Rigaud, 2009), and agreeing with the objectives of sustainable development (Yohe, 2007, p.818).

Faced with the uncertainties associated with climate change, the choices formulated by the territories generally aim either to reduce doubt by seeking to regionalize the models and to integrate more parameters for climate simulations (probabilistic approach), or to develop alternative strategies to the uncertainty described as robust by Trial (2005). This issue of decision-making in uncertain situations is not specific to local climate change management (Essai, 2005; Chalas & Soubeyran, 2010). The most relevant adaptation strategies and options vary according to the territories considered and must be defined by the involvement of local communities and with their participation in the redesign of the action. Local and regional authorities must therefore play a key role in integrating climate objectives into their public strategies, and in particular in the agricultural policies of their territory.

Conclusion:

In short, local public action around the climate and its territorialization must be strategically rethought with regard to contemporary issues raised by environmental issues. The climatic uncertainty that governs the agricultural system and the rural world requires a domestication of information at the service of development policies. Indeed, by taking a retrospective look at peasant routine practices and the current need to optimize agricultural policies, it proves imperative to forge bodies of knowledge and make them available to institutional strategies. Climate information, both customary and meteorological and statistical, now and more than ever the bases of agricultural campaigns. Public agricultural policies, in order to meet their development objectives, must be built on models that consider the vagaries of time and climate information. If agriculture always rises to the first rank of the base of local economic development, and that the local tax is for the most part derived from agricultural activities, the local authorities therefore have the imperative role of coordinating local agricultural development strategies; which will only be fruitful thanks to the control of climate information.

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