Towards an evolving conceptual framework to effectively capture the complexity of collaborative research

New approaches for carrying out agricultural research need new concepts and models to improve understanding of synergy dynamics among researchers, farmers and developers

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In the Niger case study², we have analyzed the experience of Aguié and the research carried out in order to understand the many changes underway in the wake of a genuinely collaborative program of agricultural research. In this paper, we provide some conceptual landmarks and theoretical orientations for analyzing new approaches for analyzing change in agricultural research. So, we need to clarify some basic concepts and representations to be able to debate more meaningfully on methodological issues. The theoretical developments partly rest on what we have scrutinized in Aguié. That is the reason why we invite the reader to explicitly refer to this experience as we have frequently done in writing down our ideas.

Changing a situation does not simply mean changing the words to talk about this situation. In my first paper, I have tried to schematically suggest the outlines of the complexity that is implied by any program designed to bring about actual changes in the surrounding world. Now, time has come to focus the discussion at a higher and more conceptual level in order to analyze more specifically the synergy that is more and more expected to happen between all the stakeholders of an agricultural research dealing with on-farm and pro-poor development perspectives. This paper is an attempt calling for new conceptual investments at the service of an effective development action at grassroots level.

1. An urgent need for stronger concepts, models and paradigms

Working with farmers (not for farmers) is still quite a new business. Despite the fact this intention has been on the agendas for several decades³, we cannot avoid recognizing that the concepts available for a scientific discussion concerning this desired shift are rather poor⁴, pointing out to what we believe is a serious lack of basic theoretical orientations. Is there even any integrated theory? Are the current models to collect and interpret facts sufficient to launch a sound debate on scientific grounds? What is even a fact in the field of the so-called “participatory research”? With regards to what

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³ For a brief historical overview of the many attempts to establish a real synergetic relationship between researchers, developers and farmers in West-Africa, see De Leener 2000, pp.3-8.

⁴ What exactly words like “participation”, “empowerment”, “diffusion”, “adoption”, … mean in our mouths? To which theory or models do they refer? Where and how these models are discussed and confronted with what facts? How are the facts built through which observational procedure? When agronomists carrying out on-farm researches use the word “photosynthesis”, we all know what they are talking about, provided we have been taught and still aware of some basic biological information. But when the same researcher talks about farmer participation, what does he mean exactly?
conceptualization? To what extent the focus has been exceedingly put on the technology outcomes? Why not on people at the same time since separating technology from people is adventurous?

Embarking on a new collaborative approach aiming at bringing about synergetic effects is a complicated social process in which the researchers and the developers are involved. Adopting a new technology is another deeply transformative process in which farmers are deeply involved. In both cases, we need a paradigm to refer to. We also need concepts and theories to firmly locate and circumscribe these concepts. Models are common devices to stabilize the meaning of concepts in a scientific environment. So, in this section, we would like to roughly contribute to sketch some models. We would like also to take this opportunity to refine and, at the same time, reframe some usual concepts in view of a sounder discussions serving the objectives of the GFAR seminar in Roma.

Four basic concepts particularly need to be revisited although briefly: technology, change, adoption and poverty. They all are central in our context. In addition, I would like to draw some conclusions on the future mandate of research.

2. A three-faceted paradigm for better addressing social and technological change

An area where we absolutely need a stronger conceptual framework is the field of change itself. Talking about creating a synergy between several families of stakeholders means aiming at provoking a radical disruption. We need a theoretical framework to address such a phenomenon. Of course, I do not intend here to develop a comprehensive theory of change likely to embrace a sufficient amount of rural events and facts. I just want to provide the reader with enough insights to support the deepening of such a subject matter.

When talking about changing the relationship between researchers, developers and farmers, some assumptions are needed. We have already implicitly suggested to tackle change processes from several complementary angles. This is the reason why all along our presentation of the Aguié experience we have briefly discussed institutional and personal changes in addition to providing some comments on what has actually occurred at village level. In doing so, we have implicitly highlighted three closely intertwined dimensions, the persons, the institutions and the society at large.

These three levels turned out to be particularly relevant at the end of the first year process. They have provided the grounds to consolidate a basic embracing assumption that can be spelled out as follows: as far as changes are concerned, bringing about an innovative disruption is lastingly possible if and only if:

- Changes are triggered out simultaneously at three levels, persons, institutions and society at large.
- Changes at these three levels mutually reinforce, that is to say that they are interconnected.

In more explicit terms, this means that if you work at provoking a change in one of these three poles, you must work at the two other poles or, at least, make sure that you modify the three poles at once in directly influencing only one of them. From a process-focused research standpoint, this entails that you cannot restrict your examination to only one of these poles, you must build a sufficient understanding in investigating all the sides of the three-faceted change landscape (figure 5.1). In Aguié, the successful radical change process totally depends on the fact that everything has changed at the same time --but harmoniously-- in the three poles. The changes at personal level kept pace with the changes at the other levels, particularly the institutional one as we have tried to suggest.

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5 I've deliberately avoided to use the word “participation” which has progressively become.
6 For an in-depth discussion of this basic assumption, see De Leener 1998.
We have already said a word about the identity dynamics at work when one modifies the relational context and particularly when one changes the rules of the game of the interaction. It is one aspect of the personal change pole, but not the only one and not necessarily the most relevant everywhere. Whatever the theory one refers to (Rowan 1999), one cannot fail to probe what is all about central notions such as self-concept (Bracken 1996), self-esteem (Bolognini and Preteur 1998, Rosenberg 1979, Rosenberg et al. 1995), power relationships, and so on. That means that in order to capture the whole change movement underway, one must scrutinize at least four levels: the way people involved in the change dynamic think, the way they talk, the way they do what they usually do and, of course, the way they behave in so-called participatory or interactive situations. Looking in particular at change in the way people think means examining thoroughly the way they produce their thoughts—and which thoughts—about their work and about themselves at work in the footsteps of the synergetic process.

7 Self-concept and self-esteem both prove to be key issues at stake in the Aguié change process, whatever the situations, the offices, the fields or the villages.

8 In order to be able to visualize such cognitive changes during our stay in Aguié, we have implemented a rather sophisticated procedure of assisted self-analysis. The use of videotaped self-images proves to be a powerful means to help elicit mental schemata or patterns, especially with regards to the entry into consciousness field. The change in the questioning structure when the PAIIP staff is in interaction in village real life situation provides us with an interesting example. In short, it appears that the questioning structure (the practical way to formulate and combine questions during a village meeting) has evolved from a basic structure of the type [what? —> how?] to a more sophisticated structure of the following type: [what? —> how? —>why this way? / what does it bring about?]. In practice it has turned out to be a major shift probably closely linked to the better farmer involvement. In other words, in changing the pattern of questions addressed to the farmers they significantly have changed the level of the commitment of those farmers. This example illustrates how a change at cognitive level (inner space) can bring about a change at social level (outer space). The mechanism involved can be roughly elicited: as you think otherwise, the others you work and interact with are forced to think otherwise and to behave, act and react otherwise accordingly. Despite its great interest, this finding probably supported by the researches carried out elsewhere by pragmatic conversational psychologists (Trognon and Kostulski 1996 and 1998, Kostulski 2000) has still to be scrutinized and validated by further on-the-spot researches.
The same with their emotions which is another cornerstone, as we can never completely separate thoughts from emotions and vice versa (Harré and Gillett, 1994, pp.144-161).

When you look at the institutional pole, we must pay attention to structural and organizational changes, which are two major fields of interest. Which new structures emerge, which previous structures disappear, how, why, why this way with these people,...? These are examples of relevant questions for the structural change quest. If you consider the organizational side of the institutional reality, you'll have to examine the wide array of in-team working practices, learning processes, decision-making patterns, and so on. At local society level, some aspects are particularly relevant such as gender issues, power balances, social rules of the game, norms and regulation patterns, inter-group relationships,... Working in a collaborative manner with farmers sometimes abruptly disturbs the interaction patterns and, through this channel, upsets the rules of the social game locally.

Another sometimes-complementary angle to address the same question of change is to consider what spaces are affected by action, virtually or effectively, directly or indirectly, to which extent and what are the connections between these various spaces. Here we talk about social and physical space at the same time as we start from the point of view that any physical space is also –first and foremost– a social space, at least in the eyes of those which perceive it as a space as such. The mere fact to delineate a space, verbally or pragmatically, is an implicit way to circumscribe a social space, that is to say a space where people construes and relate to each other.

We can rewrite our basic assumption in complementary terms: to wholly understand significant and lasting changes in one of the spaces considered, the project sphere, the village world or the others, we must examine what is changing in the other spaces. This is why, during our stay in Aguié, we were so interested by tracking changes in the three spheres at once, the regional research station, the villages and the PDRAA/PAIIP. How these changes reinforce themselves? We have tried to understand the change dynamics in considering what was at stake and in motion within these three social spaces.

3. A practice or a technology is first and foremost a socio-political fact

There is no technology as such, in essence, there is only a complex made of three inseparable elements: technology, persons, and situations. In other words, it is a non sense to talk about a technology without immediately referring to a person or a group of persons actually –or even virtually– called to make use of it and at, the same time, to a particular situation or set of situations wherein those persons ascribe (literally construe) a practical meaning to the technology concerned. In other words, we should always talk about that particular technology, these particular people and that particular situation. This is a very basic point that highlights what we try to suggest when underlining the lack of conceptual landmarks.

Let us further examine the central concept of technology as we have already begun to revisit it. As scientists for development, we all are concerned by this key concept of technology. We all are probably involved in some programs aiming at improving some technologies or, let's say technical arrangements. We all are keen on technological innovations. For the vast majority of national and international research institutes it even appears to be a raison d'être. If this is the case, we all know that a technology is never only a matter of technology. We feel it intuitively and we are right. In the shade of any technology, there is always a social genetic code and consequently a political code in addition to a specific economic scheme. Any technology always implicitly refers to a particular way to

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10 Of course, the purpose is not to scrutinize everything at once, which is practically impossible and scientifically irrelevant. The point here is to identify what is changing at institutional level in connection with what change at personal level, what in-house change echoes what change at local society level. Unfortunately, we cannot say more in this paper on this intricate issue.
organize in order to make value of its action potential, that is one aspect of its social dimension. Any technology refers to a particular way to share power, to a specific way to make decisions and to regulate the relationships between the persons concerned by the activity in which the technology will be used, that is the political dimension. Any technology is produced to fit certain economic criteria of profitability and, at the same time, to consume certain resources at the expenses of some possible other optional activities: these are some features of the economic dimension. You may also consider a cultural dimension if you examine, for example, the way you think and talk about components of the world through the use of a particular technology. If you promote a particular technology, you deliberately promote a specific social, political, cultural or economic order. Thus a technical practice or a technology is never only technological. Any technology implies a particular concept of the world, more precisely a complex set of running world models\footnote{The famous RWM as Gerd Sommerhoff defines it (see for example 2000, pp.12-13).}, which are more than a personal understanding, but really a sort of socio-political genetic code deeply enshrined in the "flesh" of cold purely technical instructions. Simply because the way one does things may be socially or politically pertinent or irrelevant. Simply because the relevancy of our achievements is first and foremost a matter of social assessment in addition to technical outcomes. That is one of the many reasons why adoption is not only a matter of technological performances, at least in a still rather uncommoditized environment as it is the case in the vast majority of rural poor West-African villages. The same rationale we have applied to technology can be applied to any knowledge, as Giordan and de Vecchi (1987) have so elegantly—and so judiciously—demonstrated.

That is the reason why discussing about technical innovations with farmers is not simply a gentle technical conversation about "how to do what otherwise?". A lot of sensitive balances are at stake beyond the choice. In reality by addressing the "how to do" hill-side people discuss more around another crucial question "what brings about what?". That is the reason why researchers were rather upset in Aguié: they could not limit themselves to technological aspects, they were forced to address all the other facets at the same time. They were not necessarily eager to tackle these other facets of the problems, but they had to simply because it was the only way to keep on collaborating with farmers. For instance, concerning the specificity of women’s situation, researchers had to facet this deeply disturbing fact: improving cereal yields in the Aguié area often means impoverishing and even aggravating child and mother starvation. How such a horror is possible? In this Aguié Haussa society, men and women do not necessarily live together. In other words, usually husbands and wives do not eat in the same pot, they do not share the same budget, they even do not sleep under the same roof and sometimes they do not converse together. In brief, there is no household in our usual westernized meaning of the word. As one woman states it clearly, "Here, there are two villages, the village of men and the one of women […] We live together but we are not together"\footnote{A young woman member of a village structure in Sabon Moussou (30/08/2001, 4.00 p.m.)}. Paradoxically, men and women live together separately and this strange partition can be found back in the fields since fields are quite often the projection of the social discrepancies in the agrarian space. They often use the same space, but they do not harvest the same crops. Sorghum and millet are considered male crops whereas cowpea and other vegetables usually are perceived as female crops\footnote{In reality, the picture is much more complicated so that we should make finer differentiation but it is impossible in the framework of this paper.}. When harvesting, the bad millet or sorghum ears, those which are infested or spoiled by pest attacks or abnormally small, may be collected and stored by women in order to feed the children. Women and men harvest the beautiful and large ears, but usually the men sell the major part of the harvest after having left a modest share to their wives. So, in this very particular social context, it is easy to understand that if you improve the cereal yield you do not necessarily improve the women living conditions. It may even be worse simply because by virtue of your improved pest management there are fewer bad ears to be collected.

Now let's come back to our researchers who are all skilful cereal breeders. When they discovered this situation, their challenge changed at the same time as the scope of their research did. A new broader question arised: how to improve the cereal economics—and not only the plant of cereal itself—so that it actually improves the well being of all the stakeholders involved in the production process? A
question rather more complicated than the former one, which was mostly restricted to increasing physical yields through climatically appropriate germplasm and better pest or fertility management.

This case provides us a clear-cut example of the absolute necessity to take into consideration all the social, political and economic aspects when innovating. It clearly turns up that any technical innovation, whatever its intrinsic technological efficiency, always triggers out a socio-political transformation process, often incognito. This transformation may be consistent with its context at large but also unbalanced and unbalancing. That is why research must also be carried out at the same time in these other fields of relevancy. That is why a an agricultural research can not be undertaken without any reference to a particular socio-economic environment. That is why it is so harsh to produce technologies likely to fit all situations whatever their intrinsic performance. That is also why it is so difficult (impossible?) to manipulate criteria like "adoption" or "adoption rate".

A first lesson can be formulated from this experience: be less product-focused but more real life people-oriented. However in order to be able to draw such a lesson, we have first and foremost to entirely mentally reshape our conception of what a technology means and implies. We think that the multi-faceted conceptual approach we have grossly outlined may be of a great help for everybody eager for capturing the essence of the synergy we are looking at. Fortunately the farmers themselves can help us to embark on the right boot as for them you cannot address agrotechnological topics without simultaneously tackling social issues. We just need to listen carefully to them.

4. In agriculture, adopting a new technology or practice basically means reinventing it

A lot could be written on technology adoption as it is a touchy and still fashioned issue. As a matter of facts, for several decades one talks about adoption as if it was a self-evident process. Are people interested by a new technology? They just have to adopt it! So, in its most reductionist version, the only problem would be to propose the right technology at the right time. It is all that simple? In a previous synthesis paper, we have already explained and demonstrated that the concept of adoption is rather deceitful (De Leener, 2000, pp.8-13 and pp.19-30). Adoption is a paradoxical process. No farmer adopts a new agricultural technology without changing a lot of things and, surprisingly, the adopted technology itself. Adopting a new agricultural technology or a new practice is not like adopting a new pill against headaches or a new software: take it as it comes or leave it. Paradoxically adopting a novelty in the field of agriculture precisely means changing the novelty that you are just adopting, hence failing to adopt it as has been introduced. This apparent paradox is not so hard to decipher. Just bear in mind what we have discussed previously about the multifaceted nature of any technology (see above section 5.2). A new technology must technically fit the situations faced by the adopter, but it must also match all the non-technical objectives and particularly the equilibrium between these objectives. In addition, each farm is a singular one and each farmer holds in mind its own decision-making framework. This means that practically, he or she has to reshape, sometimes entirely, the new technology before adopting it in order to make it match his or her particular situation. Here, reshaping involves two complementary processes: ascribing new meanings to the adopted novelty and transforming it both physically (its structure, its feature) and pragmatically (its use).

14 Here we should more thoroughly introduce and develop our concept of *inner compass* in addition to the concept of *circumstantial optimum* (De Leener 1986, 2000, Dupriez and De Leener, 1988 and 1989). They both refer to the fact that any farmer has at the same time to balance out several contradictory and sometimes competing objectives related to the same technical gesture, practice or technique. According to our field works in West and Central Africa since 1980, six objectives have most frequently to be balanced out when carrying out agricultural activities at village level: self-sufficiency (food security), income generation, peace maintenance both at kinship and village level (quite often bound to the management of fear, spirits and invisible forces), prestige or reputation (public self-image, public identity dynamics), wealth redistribution, hazard and risk prevention. All these six basic objectives must be attained at the same time when cultivating as they are the keys of honourable life at village. We have demonstrated that any agricultural decision is carved right out of these various objectives.

15 Practically that may mean using it unconventionally, otherwise than technically prescribed, in a typically catachresic way (Clot, 1998).
The simple fact of talking about synergy in a development context means that a simple adoption is hardly believable. The synergy precisely prevents the potentially adopters to readily adopt the proposals as they receive them. Why? Simply because any invention whatever the domain is always a reinvention and at the same time a rediscovery. Both for the inventor himself/herself and for the adopter. To be capable to adopt the innovation, the latter needs to unbuild and rebuild the way he or she mentally conceives the situation relevant to the innovation. Not only the physical frame in a synchronic here-and-now perceived perspective but also himself/herself within this physical frame. In other words, the innovation forces the would-be adopter to represent things and himself/herself among these things in a new way. In doing that, he or she is forced to transform the innovation conceived by an inventor unaware of the details of his/her situation and particularly unaware of his or her circumstancial optimum precisely when he or she decides to adopt the novelty, that is to say to make use of it. This work which simultaneously takes place internally (mentally) and externally (in the physical world) elicits the first transformation, at the adopter level. The innovation as has been adopted is in no case the same as has been introduced by the inventor. It has been literally reinvented mainly through ascribing new meanings and goals. One can observe a similar work at the inventor level provided he or she is the witness of the adaptation endeavors by the adopter. Seeing the transformation done by the adopter on his/her own invention and examining the outcomes of this transformation forces him/her to reconsider what he/she has proposed. Quite often this encounter brings about the generation of new ideas and, by the same way, new representations at both level, the self-representation and the new technology itself, its features and context of relevancy. Here lies the core of the synergy on the side of the inventor.

A concrete example in Aguié will help us to better visualize what we are talking about. Let's come back to the case of this tree (Piliostigma reticulata) whose freshly cut branches would repel some insects ravaging millet ears at the very sensitive blooming phase (Pennisetum sp.). Originally this was a practice implemented by women to protect their marrow and bottle gourd grown in small plots (Cucurbita moschata and Lagenaria siceraria). During the diagnosis phase, they explained how they scattered the branches of the tree to protect the plots. This gave the idea to the other farmers to try out the same technique in their cereal fields. In order to do that, they had to adapt the initial proposal made by the women to their particular case as millet fields are quite different from small plots of marrow cultivated next to the compound. They had to rethink and at the same time to reinvent the technique. This is the first side of the reinvention process: those who need the technology mentally refine it in order to practically make it fit into their own particular perception of what should wisely be done, why and how. At the same time, the researchers of the CERRA (Maradi), which were present and active during the same diagnosis phase were extremely eager for verifying the effectiveness of such a promising practice. They immediately thought about scientific reasons to explain the potential protective impacts of the fresh branches. But they had also to take into account the experience and the explanations of the women, as a first assumption. This is how the second side of the reinvention process was launched. Farmers, men and women, and the researchers debate on what and how to experiment in order to verify the potential of this technique. In doing so the researchers had to challenge all the knowledge they usually mobilize in order to be able to discuss with the farmers. These farmers were pleased to do the same, consequently it was a true exchange. Eventually several fields were chosen to test the practice in conformity with an agreed experimental protocol.

The encounter of two different sets of perspectives around the same situations, the farmer explanations on the one hand and the scientific conceptualizations proposed by the researchers on the other hand, was probably the most interesting and fruitful issue. Both families of stakeholders had to revise their own representations, that means thinking otherwise the situation they were both examining. This was an important aspect of the synergy, let’s say the cognitive side. But, of course, it was not the only one. More practically, the exchanges have raised a lot of hopes both sides: the researchers dream of

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16 See, for example, Giordan and de Vecchi (1989) for an accessible in-depth exploration of the complex mechanisms at work at this level.
discovering new pest management resources that could be certified and disseminated in the wide scientific family as we have already mentioned, whereas farmers were very motivated to work out a new practice likely to secure their yields. On the other side, the PAIIP officers strived to create the best exchange conditions, not only between researchers and farmers but also between farmers coming from next-door villages. For them, a promising synergy is underway in the field of facilitation.

Some lessons can be drawn from this example. Clearly if you are a researcher about proposing an innovation you should conceive it in such a way your technical proposal can be adapted, even radically, in order to fit as much particular situations as possible. That means that exchanging with the potential users and to let them influence the way you understand the situations proves to be the best – and probably the cheapest– way to keep on innovating, that is to say to make your technical proposal or discovery keep on evolving. Eventually it also appears that a synergetic interaction is basically the mutual and creative actualization of a change in the representational spheres: new mental images of the problems and of what is at stake in which situation, but also new images of oneself, of others and of oneself among these others in the wake of the inner work of representing otherwise the reality.

5. A sound and genuine pro-poor research strategy demands a radically new concept of rural poverty and, consequently, a change in the way we carry out agricultural researches

The question of rural poverty is crucial for most development projects and justifies the efforts made by the researchers at all levels. That is why refining the concept of poverty is not a waste of time. It is even an urgent necessity. The development partners’ concepts should be broadened at least with regards to two points: first, the right perception of what is actually at stake with the so-called poverty concept, second, the nature of the concept itself, probably too narrowly tailored to seriously address practical issues. Instead of talking about poverty, be it rural or urban, we should rather consider the impoverishment process in force. Poverty is a state. As such, it mostly highlights what one does not possess or what one lacks. When you talk about impoverishment, you consider the other part of the reality, that people possess a lot of things and that they are loosing them. One looks at people quite differently in both cases. When mentioning poverty, one means that people are poor because they do not have and the concern is how to get them what they do not have. When thinking in terms of impoverishment, one sees people which already possess something but those people are threatened, they are about loosing what they have. In this case, people are not basically poor, they are becoming poor, which is quite different. So, in my opinion, the development challenge should be formulated not so much in terms of how to alleviate poverty but rather, and quite often more purposefully, in terms of how to stop the impoverishment process the so-called poor have to face. In more provoking terms, one should even say that the right challenge is rather how to save the wealth of the poor!!

Precisely, among this wealth, one finds local knowledge, practices and technologies. That is why when we help farmers improve their own agricultural practices we contribute directly to alleviate poverty or, more precisely, to increase local wealth. So talking about increasing wealth instead of alleviating poverty, or even instead of reducing impoverishment, forces us to see the world –and the supposedly poor in that world– from a radically different angle. It is still the same world but, precisely because our look at that world has changed, people turn out to be different. They are not poor any more, they are not disabled people, they are just people like us, that is to say, as rich as we are but differently. That is the reason why a genuine partnership becomes possible: only equal but different people can actually collaborate in a synergistic research. Those they do not possess anything cannot truly interact with those they possess everything. Collaboration or synergies are matters of well-balanced relationships, both sides must actually give and receive something and, in addition, they must have the feeling that what they give and receive is of a great value, both for themselves and for the partners. The shift we have to operate mentally and practically can be pictured by the following formula:

17 We should also say, following the same line, how to stop convince them they are poor simply because they do not have all what we possess, simply because we just do not see their riches (Sachs, 1992).
Alleviating poverty —> reducing impoverishment —> Increasing richness

This shift must influence the way we think our role as researcher and, consequently, the very nature of our researches. Instead of claiming we are saving poor people with our brand new technologies, wouldn't it be also purposeful to help farmers better use their own resources and know-how, to back up their efforts to better experiment and innovate in order to improve their well-being the way they conceive it? Isn't this another job and another mandate for researchers and research?

In order to be capable to actually realize such a shift, we have to change our own definition of what poverty –or wealth– are. More precisely, we have to broaden our concepts. Five dimensions are closely interrelated\(^\text{18}\) which allow us to identify five corresponding types or facets of poverty.

**Economic poverty** and **material poverty** are well-known. The former refers to inadequate incomes in a monetary world. Basically, the perspective is more or less always the same whatever the angle one adopts\(^\text{19}\): how to increase the purchasing power? In other words, how to help people buy more extensively what they need as buying would be the only way to satisfy one's existential needs in a commoditized society. The latter refers more specifically to the lack of access to basic services such as health, education, water, food and physical security, infrastructures, means of transportation,… In addition to these two well-known facets of poverty, we should consider **at the same time** the following three other crucial ones:

- **Social poverty** which stresses the degradation of the social networks and solidarity fabrics. People feel more and more isolated, more and more alone in front of the existential challenges everyday more complicated. Exclusion, loneliness, rejection, competition,… are some of the most usual signs of this kind of poverty (De Leener 1994).
- **Political poverty** which emphasizes the ever-increasing difficulty to have access to the places where decisions are made. More and more important decisions directly influencing one's life and well-being are made by unknown, remote or invisible powerful authorities. People feel dominated by and excluded from the decision making processes. Rules of the games are quite often imposed violently whereas people do not even have the means, concepts and power to understand them. Political poverty is frequently associated with alienation and obscurantism.
- **Symbolic poverty** is probably the most thoroughly devastating and, at the same time, the most neglected by poverty fighters. Symbolic poverty refers to the fact that one does not have anymore cultural means, be they conceptual or even linguistic, to explain to oneself and to one's significant others the sense of one's own existence, neither the meaning of the life at large, nor the meaning of what occurs to oneself. One finds dominated by beliefs originated by other more powerful people, whereas one's own history dissolves in the history of those dominating. Frequently oblivion of oneself as a respectable identifiable identity turns out to be the end point of such a pauperizing process\(^\text{20}\). Westernization is often mentioned as an example of such a phenomenon (Sachs 1992).

No need to say that it is of a prime importance to combat poverty on all these five fronts at the same time. This is why the way to collaborate with farmers when carrying out agricultural researches is so particularly crucial. This why the technical outputs – the new promising technology, the improved agricultural practice or the new more profitable farming system– are not the only expected issues as they usually concern only the two first dimensions of poverty. The way one produces these outputs, the approach and, above all, what this particular approach socially, politically and culturally means, are probably more important than the outputs themselves. Are we to consider that taking into account


\(^\text{20}\) One feels like the other, but intimately one knows that one is not this other, not even like him/her, just some appearances.
One only tries to imitate this admired other. The worse is that one knows this other knows it very well. And one feels it in one's bones. Unfortunately, at the same time, one also feels that there is no other alternative. Being someone is being like others but basically lesser. Symbolic poverty leads to an painful identity deadlock, that is why it is so devastating.
simultaneously these five inseparable facets of poverty is a precondition for efficiency and relevancy? If we scrutinize the Aguié experience, it appears that the PAIIP has fought against impoverishment through two complementary ways: first in binding intimately technical and social researches within the same process, second by making high value of local resources (mainly knowledge and persons possessing know-how). Moreover, in promoting local practices and in triggering out an open debate around formulating a plan of action, the PAIIP has significantly though indirectly combated poverty at both political and symbolic levels. These were no lucky side-effects but deliberate endeavors within the framework of voluntary actions. This is exactly what is expected from an actual pro-poor research program.

6. New roles for agricultural research: producing knowledge or impacts?

Producing new knowledge, challenging old knowledge is at the very heart of the scientific activity. But do farmers need new knowledge scientifically certified? Not directly. On the other hand what they directly demand is changing some existential situations. That is, impacts. Basically, they need knowledge for action at the same time as knowledge from action, particularly their action. They do not urgently need neither new against old knowledge, that is knowledge for knowledge, nor so much certified knowledge from consolidated knowledge. That is sometimes the contrary for the researchers. They are prized for the knowledge they produce in a formal and conventional way provided they match a particular environment. They are eager for this particular kind of knowledge that can be located in a theoretical tradition and recognized by respectful peers. That is the reason why the encounter between researchers and farmers often is so hard to be transformed into joint action, not to speak into synergy. Producing knowledge for impacts is not warranted after forty years of agricultural research. So, instead, can we dream of producing impacts in producing knowledge? This is probably the ultimate way to bring together scientists and farmers. This is also the purpose of the action research approach we have been trying to promote in West-Africa for the last two decades (ENDA GRAF Sahel 1996) as others do in other European contexts (Reason 1988, 1994 and 2000, Heron 1996). For these researchers as for us impacts are defined by the people directly concerned and authors of the research which is at the same time a concrete action. Knowledge is more or less a by-product of this revolving process [action —> research —> action —> …]. Knowledge may be of a great importance if it turns out to be the purpose of the action. But action –and particularly the impact it produces on reality– is always the starting point and the conclusion of the so-called action-research process. This is probably another issue to be debated more explicitly as it is not so unusual to meet researchers that actually believe that producing knowledge for development is the same as doing development.

7. "Deritualize" research tools and devices?

Science is powerful creativity tool. But it is just a tool. Like any tool it is dedicated to particular ends. Often science becomes an unmanageable obstacle when becoming an end in itself, the so-called quest for truth, at least in West-African rural areas where concerns are of another essence. At village level, the only acceptable outcome of any investigation is an affective and efficient local answer to a question raised locally by people preoccupied by some particular existential situation or problem. Whether this outcome fits or not the scientific criteria, whether this outcome is falsifiable or not in the Popperian sense of the word (Chalmers, 1976), whether or not it is replicable everywhere else in the world, whether it rests on scientifically certified and validated knowledge or not, all these concerns are not necessarily relevant in rural areas in the eyes of the village practitioners. These are merely concerned to know whether a given answer is a relevant solution to their problem or not.

As a matter of fact, there is no absolute relation between scientific rigor and impacts on the real life situations. Scientific does not definitely mean neither effective nor relevant. Sometimes so researchers we work with in Maradi felt at odds with the scientific side of their works. One of them clearly have pictured his uncomfortable situation as follows: "On the one hand, I have to work for the farmers, I have to give them relevant answer to their problems. On the other hand, as I am member of a scientific
institution, I have to produce answers that are also scientifically sound in addition to be relevant for farmers. Now, quite often, when I am relevant with farmers, I feel irrelevant vis-a-vis my scientist fellows and vice versa [...] But my career is totally linked to the scientific quality of data and results I produce". One of the head of the Maradi research station was even more embarrassed: "I feel dominated by the international institutes [...] They establish the rules of the games according to their own validity criteria. The science they talk about is more or less their science. I mean a science that fits very well their history and their context, be it economic or political".

This is undoubtedly a touchy and complicated issue. We do not have the room to address seriously this question. In Aguié, something has been clearly established: the collaboration has begun genuinely when researchers have made decision to be less scientifically rigorous but more attentive to what people really wanted to verify or test. The questions remain still open: is producing science our ultimate raison d'être? Or are we rather called to help produce significant, sustainable and practical impacts whatever the way? Now, in the footsteps of the Aguié experience we could also raise the question from a new angle: would our mission, as scientific researchers, be rather to help people find (build) themselves their own answers? That means helping them experiment themselves in order to produce their own expected answer. Whatever the answer, if any, the debate is open. But, beforehand, wouldn't it be preferable to get definitely rid of some cumbersome misleading beliefs (table 5.2)?

### Table 5.2.
#### Misleading beliefs?

<table>
<thead>
<tr>
<th>Some possible fallacies to be discussed</th>
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<tbody>
<tr>
<td><strong>Fallacy 1</strong> ? Strong and coherent scientific backgrounds warrant strong and relevant on-farm impacts [Science =&gt; Impacts] ?</td>
</tr>
<tr>
<td><strong>Fallacy 2</strong> ? High yielding technology ensures attractiveness and impacts [Good technology =&gt; Adoption + Impacts] ?</td>
</tr>
<tr>
<td><strong>Fallacy 3</strong> ? A technology is a technological matter. A technical problem is mainly a matter of technology.</td>
</tr>
<tr>
<td><strong>Fallacy 4</strong> ? Scientific approaches and procedures are the only ways to be rigorous to explain and act on reality. [Science = Rigor] ?</td>
</tr>
<tr>
<td><strong>Fallacy 5</strong> ? Science unites local realities into a global perspective. [Science =&gt; (Local —&gt;Global)] ?</td>
</tr>
</tbody>
</table>

Philippe De Leener, GFAR Workshop, Roma, 9-10/10/2001

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21 A CERRA’s researcher (Maradi, 24/08/01, 11.30 am)
22 A CERRA’s senior researcher (Maradi, 24/08/01, 9.30 am)
23 As a matter of facts, one would be too reductionist in closing the debate in a sort of inescapable dilemma the type of "All science or no science". One way to get out of this apparent –and certainly too extreme– dilemma would be to keep in mind that there is a wide range of ways of doing science. The problem comes where researchers fail to think their scientific approach with regards to the reality where they are called to intervene. To the contrary, should we not consider that sound science adapts to the everchanging and multifaceted reality?
8. Some concluding remarks

We have now revisited some key concepts. At the end of this paper we are in a better position to highlight the meaning and the scope of this attempt. In practice, what all these conceptual reshaping means? Practically, in promoting collaborative research, we are operating a shift from focussing on technical problems and from producing related scientific knowledge onto concentrating on changing lived situations. The concept of situation turns out to become the new key concept encompassing in an united whole previously isolated concepts such as problems, knowledge and technology. But beyond this representational shift there is another one, probably more basic, a professional shift or an identity change needed in order to take into account the fact that the true mission of a research institute is about promoting change.

If we agree that carrying out agricultural research means working with farmers rather than working on agricultural problems, this is quite another job. Obviously, it is not a matter of carrying out agricultural research otherwise, let us say in a more participatory fashion, with new methods or whatever. It is a matter of researching something else, thus basically doing something else. In the case of agricultural research for farmer or community development, this new focus points out another work. The very nature of the research activity is completely changing. In realizing that, we are definitely forced to recognize that the Global Partnership Programs (GPP) which are at the center of our interest in this workshop should probably also be something completely different, and surely not limit themselves to simply re-allocating financial resources or re-organizing the research activity at another supposedly more consistent scale. In fact, are we not talking about how to reshape the very content of our work as researcher for development? Consequently we are not here to put a new mask on an old face, not even to change the face, but to wholly rebuild a new coherent set of missions, goals, objectives, conceptions and practices for a network of international institutions. Since the true nature of the challenges has changed, the very nature of our raison d’être as research center or pool must change accordingly.

Henceforth carrying out agricultural research for development with rural communities or farmer organizations cannot mean any longer producing scientific knowledge and promising technologies to be disseminated. It means collaborating with farmers or village organizations in view of helping them, whatever the scale considered, better cope with complex existential situations whose elements may sometimes be of technical nature but not exclusively so. Isn’t it what is actually at stake?

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24 Unfortunately, we do not have room to more deepen this concept of situation. For further inputs, see for example Pastré (1999) or Daniellou et al (1993). The notion of situation is also of a great interest is the field of personal change or development (Consider, for example, the school of interactionism and situational theory of personality, Magnusson 1971, 1974, 1976, 1981, 1990 or Krahé 1992, pp.69-98 and pp.196-232).


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