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HOUSEHOLD TYPOLOGY FOR RELATING SOCIAL DIVERSITY AND TECHNICAL CHANGE.

The example of rural households in the Khambashe area
of the Eastern Cape Province of South Africa.

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Abstract:

Various South African policy statements and strategy proposals argue that farmer focused planning and farming systems research approaches are required to develop policies, strategies and project activities to serve farmers efficiently. Then, the question is how to give a practical content to these requirements, and how to avoid that technical farm relations could be emphasised without recognising the diversity in farming situations and without contextualising such technical relationships in the wider social, economic and political environment. In this prospect a research, based on rural household surveys, has been carried out in the Khambashe area of the Eastern Cape Province. On the basis of this example, the authors discuss the usefulness of household typologies to link social diversity and technical change.

Key words: agriculture, households, typology, technical change

Résumé :

En Afrique du Sud divers textes d'orientation politiques stipulent qu'il faut promouvoir des recherches en termes de systèmes agraires et de systèmes de production pour concevoir et mettre en oeuvre des mesures qui permettent d'accompagner efficacement le développement agricole. Dès lors, il s'agit de donner un contenu concret à ces approches, en évitant que la dimension technique soit mise en avant indépendamment de la diversité des formes d'exercice d'activité agricole existante, et en la remplaçant dans son contexte social, économique et politique. Dans cette perspective, une recherche basée sur la réalisation d'enquêtes auprès de ménages ruraux a été réalisée dans la zone de Khambashe dans la Province du Cap de l'Est. A partir de cet exemple, les auteurs discutent de l'utilité des typologies de ménages pour relier diversité sociale et changement technique.

Mots clé : agriculture, ménages, typologie, changement technique

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1. INTRODUCTION

Various policy statements and strategy proposals in South Africa argue that farmer focused planning and farming systems research approaches are required to develop policies, strategies and project activities if farmers are to be served efficiently (Draft Agriculture Policy Green Paper, 1998). The question is then how to give a practical content to these requirements, and how to prevent the technical aspects of farming development programmes from ignoring the diversity of farming situations and from overwhelming the social, economic and political contexts. Research based on rural household surveys was carried out in the Khambashe area of the Eastern Cape Province. On the basis of this example the authors discuss the usefulness of household typologies for relating social diversity to technical change.

2. ECONOMICS, TECHNOLOGY AND AGRICULTURAL DIVERSITY

The use of farm typologies emanates from a view of agricultural development where diversity (of structure, of agricultural practices, etc.) is not considered to be an obstacle or constraint to the modernisation of the agricultural system. Diversity is rather viewed as a manifestation of the capacity of the agriculture system to adapt to and sustain different situations. This approach recognises diversity as an important element to be noted and interpreted in rural development policy and planning. It does not contest that differences in economic size (capital, hired labour, land) are a source of inequality in economic performances, but it rejects the Taylorist principle that there is such a thing as "one best way". Within the same range of economic size, it is accepted that good economic and technical performances can be obtained through different ways of production and farm organisation. When comparing small scale and large scale farms, the differences in the production processes may be not only quantitative (more land, more labour,...) but also qualitative (different ways of taking into account the variety of available factors *i.e.* genetic diversity of crops and animals, physical environment, etc., and specific techniques to crop, breed and transform products). A wide range of empirical studies (Brossier et al. 1994, Sébillotte Dir. 1994) supports these latter points.

The notion of a technical optimum is increasingly questioned in the economic analysis of productive systems for all the sectors of activity (Dosi *et al.* 1988). Many comparative studies give evidence that the heterogeneousness of productive configurations persists at national, regional, local and enterprise levels (Foray, Freeman Dir. 1992). Conversion to a single best structure is not an emerging feature. Diversity is maintained. Moreover, the economic crisis faced by most developed countries showed that progress in technical and scientific knowledge does not necessarily imply economic growth *per se*. Analyses of the economic and sociological mechanisms that influence technical changes and development paths are found to be crucial to develop recommendations for political and intervention programmes.

Therefore, a wide range of research work from different theoretical standpoints stresses the need for analysing the diversity of the relationship between economic processes and technical change. This is stressed for example in the field of historic economics (Dockès 1990) and in the "Regulationist Programme" (Boyer 1988), where technical dimensions contribute to explaining the mode of regulation at a macro-economic level, and the functioning of various economic sectors; it is also stressed by the "Evolutionary" approach (Nelson, Winter 1982) which accepts: the heterogeneousness of the agents, characterised by bounded rationality (Simon 1986, Lucas 1986) and of the ways of producing (*i.e.* there is no single technical optimum); the irreversibility of the innovation processes and "technological trajectories" (path dependency) (David 1988), which limits the flexibility for conceiving and adopting innovations; the consistency of scientific and technical principles which enable the addressing of technic-economic problems, *i.e.* a technological paradigm (Dosi 1988); and the materialisation of these links between the economic system and the technological paradigm into "national systems of innovation" (Lundwall 1992).

These approaches provide the theoretical basis which support the argument that there need not exist "one best" technical solution to cover all situations and that, in agriculture too, it might be necessary to account for diversity of (farming) production systems in order to deal with technical change and innovation in an effective and responsible manner. This is especially important in farm technology transfer programmes where great diversity in rural households is observed.

3. DEFINING FARM TYPOLOGIES

Agriculture and rural development planning in South Africa often looked at diversity only from a macro level, *i.e.* agro-ecological zones, administrative districts and commodity based technical farming systems, such as livestock ranching, summer grain production, etc. In reality however, micro level diversity is much greater due to the highly skewed distribution of the economic status of farming units (access to resources, markets, knowledge, etc.). These differences are also generally exacerbated by transitional forces observed in many rural communities *i.e.* migration of people, cultural changes, changes in political power structures, etc. This changing diversity should also be attended to in planning. Having accepted the importance of diversity and rejected the idea that there is such a thing as "one best" technology, a further issue is how to describe the diversity of farm production systems, whilst avoiding the pitfalls of singling out each and every production system as unique.

Typological approaches (Lazarfeld 1937, Escobar, Berdegué 1990, Landais; Perrot 1994) are among the possible "technical" responses to these economic questions, a means of building models that give a concrete content to these preoccupations. There are various

methods for building typologies, but most approaches aim at providing a framework which enables "the significant aspects needing comparison to be singled out, giving them meaning in an intelligible group structure; then units become comparable since they are analysed within the same dimension, *i.e.* the space relative to their attributes. Lastly, typologies allow these units to be placed in relation to one another and therefore to respect their particulars" (Jollivet 1965).

In an agricultural analysis of a rural situation, diversity could be described by identifying different farm/households types, which could be included in a larger typology. Ideally, a typology should include a number of types, each differing significantly from the other in terms of certain major criteria. The main issue "is not to set up the means of comparing the different types of farms (/households), but to make comparisons between farms (/households) considered sufficiently similar to allow them to be classified in the same type and their functioning to be analysed by using a single reference base. Nothing then stops each type to be characterised with the help of a specific set of indicators. This avoids the use of all-purpose variables which are inevitably poorly adapted to cope with situational diversity" (Landais, Perrot 1994).

The fact that relevant criteria for characterising types may differ from one type to another does not prevent one from actually comparing these types in a separate step (this is possible through illustrative variables, for instance income level) or from situating them in an overall analysis (for instance insertion in development programmes) (Laurent 1988, Bonnal *et al.* 1994).

However, one should keep in mind the characteristics of the entities that one wishes to compare, as well as the limitations of the comparison: the objective (economic, social, ...) of the production units and the economic behaviour of the farmers (/ or households) may vary from one type to another. Similarly, caution should be exerted before extending geographically a typology that was designed for a given area. A typology describes the diversity of farm production units within a designated spatial environment. Types within a particular typology can be compared against different typologies in other spatial situations (zones), but it is seldom relevant to make a mere transposition (Laurent, Centres 1990).

The points mentioned above support the need for constructing farm household typologies that are based on the identification and description of groups of farms with similar characteristics. Planners can then use these typologies to describe and classify categories of households and/or farms with common needs and requirements with regards to policy, programme and project interventions. This approach was tested in an area of the former Ciskei.

4. BUILDING TYPOLOGIES FOR AGRICULTURE AND RURAL DEVELOPMENT IN THE KHAMBASHE AREA

The Khambashe area forms part of the Amatola District Council in the central zone of the Eastern Cape Province. It is situated in a relatively high rainfall zone (± 650 mm per annum), 20 kilometres from the Indian Ocean and about 15 kilometres from and well connected to the urban area of East London. The Khambashe area is about 200 km² large. The topography is hilly and the field cover is well suited for animal grazing. Soils are complex, with some high potential crop producing sites throughout the area. Mixed farming is practised. Three main land tenure systems are observed *viz.* freehold areas, traditional or communal land areas, and areas where people were resettled with limited residential rights, after land removal programmes during the 1970s.

Market orientated agricultural production contributes to a small proportion of the household income in the former Ciskei area (Antrobus *et al.* 1994). However, according to natural resource potential and the information gathered during initial surveys, as well as during field visits, it was indicated that livelihoods in the Khambashe area could be improved through agriculture technology innovation. Such possibility cannot be ignored, as this area is one where poverty is especially concentrated (Saldru 1995). Therefore, it appeared necessary to position diverse households differently regarding the required institutional and technical support in order to assess how they could be integrated in programmes aiming at improving their farming productivity.

A number of information gathering activities were conducted in the area ten years ago (Williams, Ward *et al.* 1989) and recently (Zarioh, Laurent 1997). The later included formal and structured surveys (n=194) based on both close-ended and open questions, informal discussions and the analysis of existing data and literature concerning the area. After a first stage of data processing (Zarioh, Laurent 1997), and from the informal interviews, it was possible to build hypotheses to design a typology of rural households. Seven rural household types were identified. They are shown in Figure 1 and appendix 1, and can be designated as follows:

- Type 1. "Moneyless" households (11/194)
- Type 2. "Households depending on social welfare grants and family remittances" (111/194)
- Type 3. "Households earning income from non farming activities" (14/194)
- Type 4. "Households whose main source of income is farming" (36/194)
- Type 5. "Households who derive a minor part of their income from commercial farming" (9/194)
- Type 6. "Landless households" (10/194)
- Type 7. "Households with access to land, who do not farm" (3/194)

These types are based on 194 household interviews. The number of farming units grouped in each type is shown in brackets. The selection of these 194 households was made through (i) a stratified selection of villages according to different potentialities (land tenure, plant cover, size of the villages), and (ii) a random sampling of households within each village.

Type 1. "Moneyless" households (11/194)

People do not farm for the market (*). They have no regular source of income (other money earning activity, pension...) and get a very low total monetary income (less than 1000 R. per year). When they have access to land (10/11) they have a small agricultural activity. For this activity they do not buy inputs (fertilisers, seeds, ...) but they can benefit from some resources from their neighbours.

Type 2. "Households depending on social welfare grants and family remittances" (111/194)

People farm for home consumption, not for the market (*). Pensions are the main source of income for most of them (89/111). Other households (29/111) rely on children grants and family remittances from parents who work far away.

Type 3. "Households earning income from non farming activities" (14/194)

People farm for home consumption, not for the market (*). They get income from non-farming activities.

Type 4. "Households whose main source of income is farming" (36/194)

Farming is their main source of income. They sell on the market and farming is the main source of income for the household who runs the farm. They employ casual and/or salaried labour. They consider themselves as farmers and they are involved in farmers' professional organisations. They may use a high level of inputs in their farming activity.

Type 5. "Households who derive a minor part of their income from commercial farming" (9/194)

Farming is seen as part of a complex set of income and activities. They sell on the market but farming is not the major source of income. They have other gainful activities (salaried activities, self-employment,...). Some earned low cash income from agricultural activity at the moment of the survey but planned to increase it.

Type 6. "Landless households" (10/194)

These households have no access to land, not even a family a garden. They do not farm for themselves. Most of them get pensions and/or family remittances. These households were located in resettlement areas

Type 7. "Households with access to land, who do not farm" (3/194)

These households consist of old people, who get remittances, and are not able to embark on agricultural activity.

Source of Data: Surveys 1997 (M.Laurent, P.Madizikela, P.Mei, N.Monde, K.Tolbat, N.Zarion) and survey 1998.

(*) People can sell a few products during the year without being considered as producing for the market (in the surveys, they earned less than 360 R. per year of cash agricultural income).

Figure 1. Provisional Typology (Kambashe area, Eastern Cape Province)

As stated in other studies and in other areas (Eckert, Williams 1995; Eckert 1996; Bradley, Ntshona 1997; Makhura M. *et al.* 1998), the income structure may vary considerably between rural households. In Khambashe, a great diversity was also observed, ranging from income from farming only, to income from other gainful activities; from income from pensions or family remittances to no regular income at all.

Approximately 20 percent of households farmed to earn cash income; only 10 percent of households were not involved in farming, while the largest percentage (70%) viewed farming as a supplementary or survival activity to support food security. This typology situates farming as an important survival activity, and a significant commercial activity in the Khambashe area where household incomes are lower than what could be forecasted from other sources (Saldru 1995) (appendix 1).

Exchanges occurred between these different types, for food, labour but also technical knowledge. Further investigations should be made on that issue but one can already notice that the knowledge of the exchange pattern between types can help to understanding the economic functioning of a population (Figure 2).

For most people in Khambashe, agricultural activities served at least two different kinds of purposes, or functions: economic and social. (Figure 3).

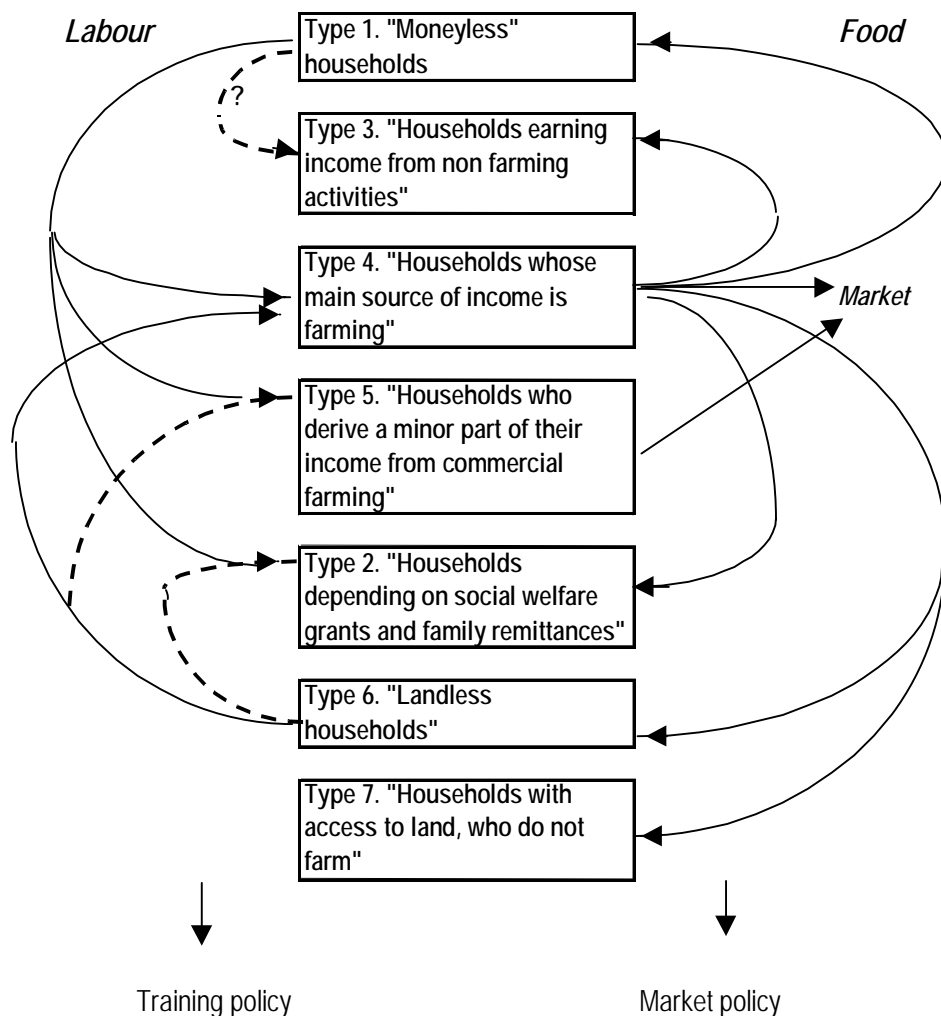


Figure 2. Examples of exchanges between types

Functions	Professional life	Social life	Family life
Economic functions	+ Main source of income + Component of a system of different incomes (pensions, other money earning activities) + Saving	+ Security in a social community system + Access to community resources + Security for land rights - <i>an activity which is not acceptable for young people (?)</i>	+ Subsistence (& housing) + To keep a potential earning money activity for children + Saving ...
Social integration functions	+ To have a recognised profession	+ To have a social status (according to the areas: ownership of cattle, ownership of land...)	+ To have an independent source of income (some women)
Other functions (for example hedonistic functions, religious functions...)	...		+

Source : surveys in Khambashe area.

Methodological note: For one person, agricultural activity may serve several functions at a time. For example two economic functions "source of income " and "subsistence", and one function of social integration "social status".

People within a household may assign different functions to agricultural activity.

Figure 3. Various functions for the agricultural activity of the households

These functions (Laurent *et al.* 1998) are materialised in the different areas of life of an individual: in their professional life (*i.e.* agriculture as an economic profession); in their family life (*i.e.* to provide a family with a livelihood, to ensure food security and to allow for the continuation of farming in future generations); and in their social life (*i.e.* farming as a means to establish social status). Further investigation should be made regarding the social functions (in particular the social significance of land and cattle ownership) but this first analysis already enables one to specify the basis of the bounded rationality among households with an agricultural activity: from an economic point of view, it can be expected that people having different economic and social situations, different projects and different perceptions of their situations will adapt their economic behaviour (Lucas 1986, Brossier *et al.* 1991) regarding their agricultural activity.

Developing the typology into a useful tool for policy making, and designing development support programmes and projects, would require further investigations in order to describe and analyse the various production relationships and problems, to specify the needs of each type, and to forecast the impact of different technology interventions and institutional changes on the expected performance of each type.

Figure 4 illustrates an extension of this. It shows several kinds of additional information which would be required regarding technical functioning and performances, work organisation and economic performances to better understand the technical functioning of each type, and to allow for planning and support. Being able to identify within each type, what practices yield the best technical and economic performances, would provide a common background reference that can be shared with other farm households, extension workers and agronomic research (Bonnal *et al.* 1994).

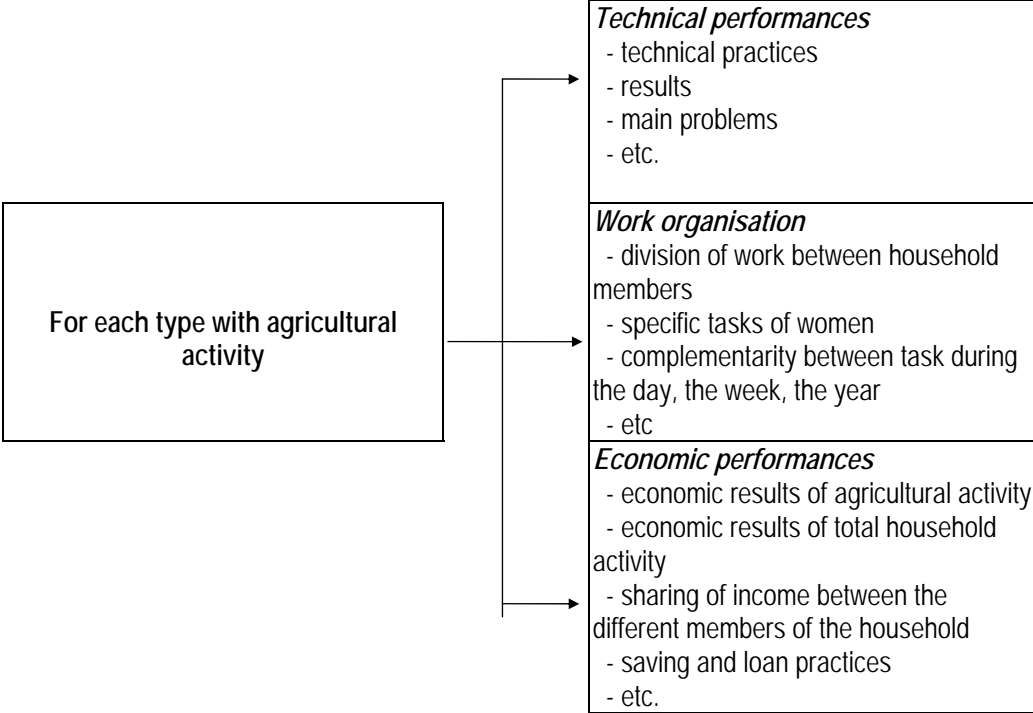


Figure 4. Further collect of information for each type

The actual definitions of the types will most probably be reviewed after a second set of data collection. But it is part of the exercise to gradually improve the typology by getting more consistent types, through both data processing and discussions with the policy makers or the stakeholders who could use this typology.

In the meantime, this first typology may be used as a backbone to organise data collection during next research and/or extension activities and elaborate first analyses on how different types of households could be integrated into agricultural development schemes.

5. TYPOLOGIES AS A BASIS FOR DYNAMIC ANALYSES

The examination of the Khambashe typology puts on the foreground one of the key question of agricultural and rural policies in South Africa (Bernstein 1997, Meunier 1998), namely which are exactly the target groups and the priorities of these policies? This question concerns agricultural policy measures as such (credit, investment grants, agricultural land regulation, etc.), as well as extension and agronomic research activities. The answer will come from political debate. In this process, building household/farm typologies may only contribute to specifying what is at stake in agricultural development choices.

Firstly, a typology can provide a representation of existing systems that helps detect which properties of the systems are of interest for the objectives of development programmes and helps identify target groups for policy measures or extension actions. In the Khambashe example, households may assign different purposes to their agricultural activity. These differences may be explained by the disparity of their economic and social situations, their own history and experiences which result in specific perceptions, classifications and behaviour, their insertion in social relationship, their aspirations. From most of the households of the survey, the wish to get cash income from farming is narrowly linked with preoccupations regarding food security, residence security, and social position within social networks. For these households, farming for food security (types 1,2,3) is not seen as less "serious" than farming for cash income. Policy decisions then have to be made on whether these households fall under agricultural policy or welfare policy; whether specific extension services and research should be devoted to these farming activities, etc.

In the same line, one may observe that households farming for the market are not only those who introduce themselves and are recognised as "farmers". The proportion of systems combining several sources of income (type 5) represents 1/5 of the households that get cash income from farming activities. Once these systems are described, how should they be integrated in agricultural policies measures? Should they be recognised only as "transitional" systems towards specialised farm systems? Or is it a priority to identify and design new systems, some kind of "rural holding" (Muller *et al.* 1989) as observed in some European regions where households create new jobs and combine different kinds of gainful activities, including farming? Which specific support could they benefit from (credit, investment grants, extension,...)?

Secondly, a typology of the kind described in this paper gives a picture at one particular moment. It is a static representation. But households may shift from one type to another (Figure 5). On the one hand, a household is not a static entity. It has its own cycle and may develop activities according to a trajectory depending on changes in the family: the number of household members and their age determine the level of

consumption but also its capacities for production and saving, and finally its possibilities for accumulation (Bonnal 1994). As such, a household belonging to one type at a given moment may shift into another type later on (for example from type 2 to type 6). On the other hand, specific support can be provided to help some systems shift towards other situations.

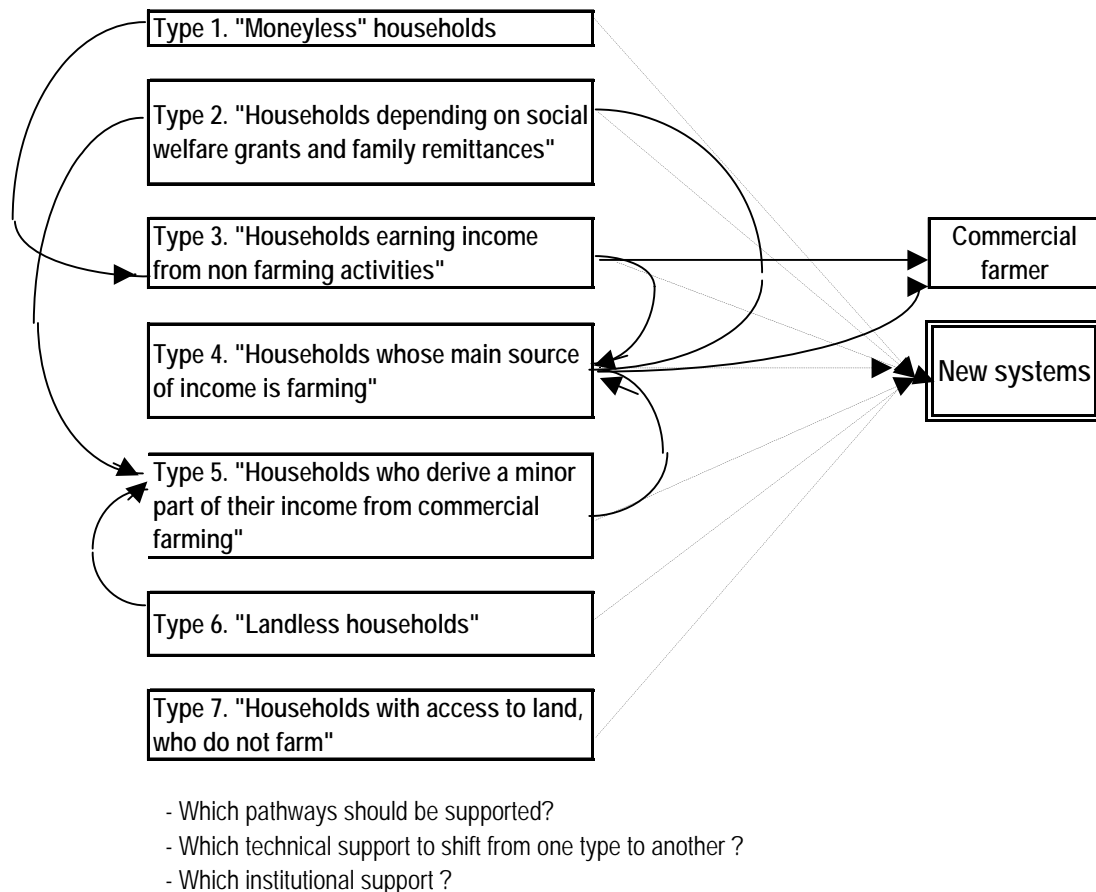


Figure 5. Examples of possible trajectories

To predict such "development trajectories" with confidence, more information must be collected, and the typology could be a basis for discussion between the different stakeholders before specific support programme and project interventions and extension measures are introduced. But in any case, the typology of existing systems does not indicate the limits of the possible evolution. Some households can make up new systems (for example "rural holdings"), others can develop systems, which do not exist in the area but can be found elsewhere (for example "medium or large scale commercial farms"). Others can move outside the former bantustan area: there is no justification why the territorial structure of future development should be reasoned within the former geographical structure.

Production systems trajectories need specific research programmes as far as technical change is concerned. From one type to another (for example from type 1,2,3 to types 5 and 6), or even within the same type (types 5 and 6). The shift in production systems requires consistent technical sequences to be followed. It is not always possible, for a number of reasons (existing equipment and breeds, lack of skill, etc.) to substitute one production to another. Taking care of this path dependency could improve our understanding of the constraints faced by farm households and help reduce them (training, references on technical itineraries, etc.).

A multi-disciplinary approach to analyse such dynamic situations is useful. Social sciences can analyse the diversity of situations, the resulting inequalities in production factor allocation and the possibilities to compensate them through relevant policy measures (credit schemes, investment grants, land regulation, research and extension schemes); the exchanges between types, the projects and the possible trajectories, together with bio-technical sciences can contribute to analyse the technical possibilities to improve the performances of each type, to describe the conditions for shifting from one type to another, and to design new and appropriate technical solutions for each type.

6. CONCLUSION

It seems to us that the South African situation could benefit from an approach which take note of the diversity of rural situations and practising agricultural activity. In that process, the use of a typology can be two folds:

1. The contribution to production of systematic knowledge on the countryside by describing the diversity of the production systems of an area. A better knowledge of this diversity may avoid the exclusion of households due to the ignoring of the specific constraints each farm type; and
2. The development of a typology to link social diversity to technical change, by contextualizing and focusing the interventions required for each type in terms of the main purpose or function of agriculture in a household.

It is however, up to policy makers and strategic planners to decide which is the appropriate path of development and which are the systems and the trajectories to be supported. These choices will regulate and influence the provision of public support systems and the evolving system of innovation

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	Type 1. "Moneyless households"	Type 2. "Households depending on social welfare and family remittances"	Type 3. "Households earning income from non farming activities"	Type 4. "Households whose main source of income is farming"	Type 5. "Households who derive a minor part of their income from commercial farming"	Type 6 "Landless households"	Type 7. "Households with access to land who do not farm"
Number of households	11	111	14	36	9	10	3
<i>Total monetary income (Rands, average per year)</i>	402	8170	13335	12717	36626	5587	9040
Number of households having any	10	111	14	36	9	10	3
Minimum	0	1000	2200	1610	3580	4440	7200
Maximum	912	32520	28888	141025	92080	7200	10320
<i>Pensions (Rands, average per year)</i>	0	5654	1106	5419	2867	3612	3440
Number of households having any	0	89	3	24	5	7	1
Minimum	0	0	0	0	0	0	0
Maximum	0	25800	5160	19400	5160	5160	10320
<i>Salaries and wages (Rands, average per year)</i>	36	237	10621	0	21433	0	2400
Number of households having any	1	10	14	0	6	0	1
Minimum	0	0	2080	0	0	0	0
Maximum	400	6000	24000	0	81600	0	7200
<i>Income from agriculture in cash (Rands, average per year)</i>	67	9	36	2070	1751	0	0
Number of households having any	3	20	4	36	9	0	0
Minimum	0	0	0	390	480	0	0
Maximum	350	312	200	15506	8270	0	0
<i>Size/Fields of arable land (morgen, average)</i>	3	2	2	3	2	0	2
Number of households having any	4	*93	*8	*32	*8	0	3
Minimum	2	0	0	1	1	0	1
Maximum	3	7	3	16	5	0	4
<i>Heads of "micro" livestock (goats, sheep) (average)</i>	4	8	5	16	17	3	2
Number of households having any	6	89	12	31	9	6	2
Minimum	0	0	0	0	1	0	0
Maximum	12	121	14	85	67	17	3
<i>Heads of "macro" livestock (cattle, donkeys...) (average)</i>	7	6	6	19	23	0	0
Number of households having any	8	8	9	31	7	1	0
Minimum	0	0	0	0	0	0	0
Maximum	15	85	50	99	149	1	0
<i>Total number of people in this group of households</i>	52	702	81	241	64	62	12
Including <15 years old pers.	19	206	22	69	21	14	4
Including >60 years old pers.	1	111	4	36	6	6	2

* number of households for which data was available

Annex 1. Distribution of income in the different types